

# Improve the productivity of any discrete parts production process



**PRODUCTION PROCESS**  
Manage production, machines and OEE in real-time  
[www.productionprocess.com](http://www.productionprocess.com)

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## Decades of experience in improving manufacturing productivity

**ProductionACE is a practical, proven and affordable system to help you improve the productivity of any discrete parts manufacturing process.**

**The system connects directly to all types of production equipment through a family of Machine/Operator Data Transducers (**MDT**). For some types of “Intelligent” equipment, OPC or MTConnect can provide the connection.**

**Either way, you can match your data collection, data display, operator interface and ERP integration requirements to individual machine functionality to implement the most flexible and cost-effective system available today.**

**ProductionACE is installed in more than 700 manufacturing facilities of all types and sizes...from an eight--machine molder, to many multi-plant Fortune 1000 companies.**

If you don't track performance in real-time, you cannot improve it.

## Real-world examples of productivity gains with **ProductionACE**:

**Commercial printer improves customer satisfaction with on-time delivery.** After operators scan in a work order to run, the system calculates and tracks order completion in real time based on the actual, current speed of the machine, order quantity, and shift schedule.

**Multi-plant molder tracks machine loading and performance in every division on-line and analyses downtime causes.** Not only has delivery performance improved, but the ability to collect and analyze downtime causes allows managers to identify manufacturing problems that interfere with meeting productivity goals.

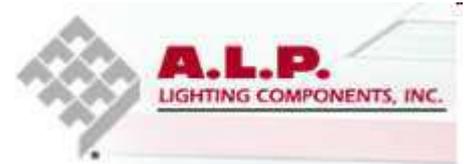
**Film/foil Converter discovered Production Standards were incorrect, causing loss on some jobs.** With data derived from automated performance and OEE tracking, Job standards are now based on real world conditions.

**Medical device manufacturer tracked, analyzed CNC setup process steps, realized major productivity gain:** Based on process analysis, they implemented improved procedures to reduce setup time, thus realizing an annual, overall plant setup time reduction of 40% or 1,941 hours.

**Multi-plant container manufacturer replaced inaccurate manual OEE measurements with automation.** Now, using automated collection of productivity data by machine, product, shift and Operator, company is well on its way to world class OEE levels.

**Multi-plant Molder Saved 5,000 man-hours per year with automated manufacturing data collection for ERP.** The daily effort to maintain the ERP solution was reduced to less than 1 hour per day per plant with improved planning and inventory accuracy

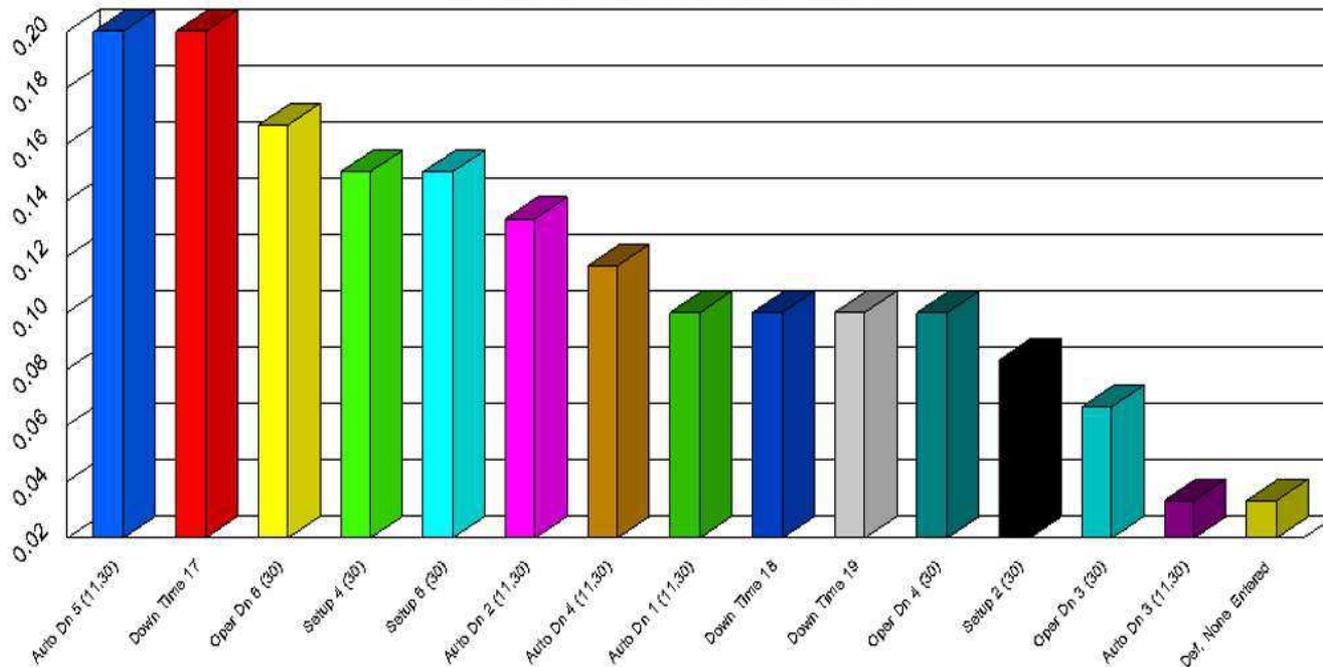
ProductionACE: Installed worldwide in over 700 manufacturing facilities.



Increase uptime, reduce downtime: collect and analyze causes for Downtime and Rejects with simple, yet powerful graphical tools.

Downtime and Reject Causes can be reported by Machine, Job, Product, Shift, etc.

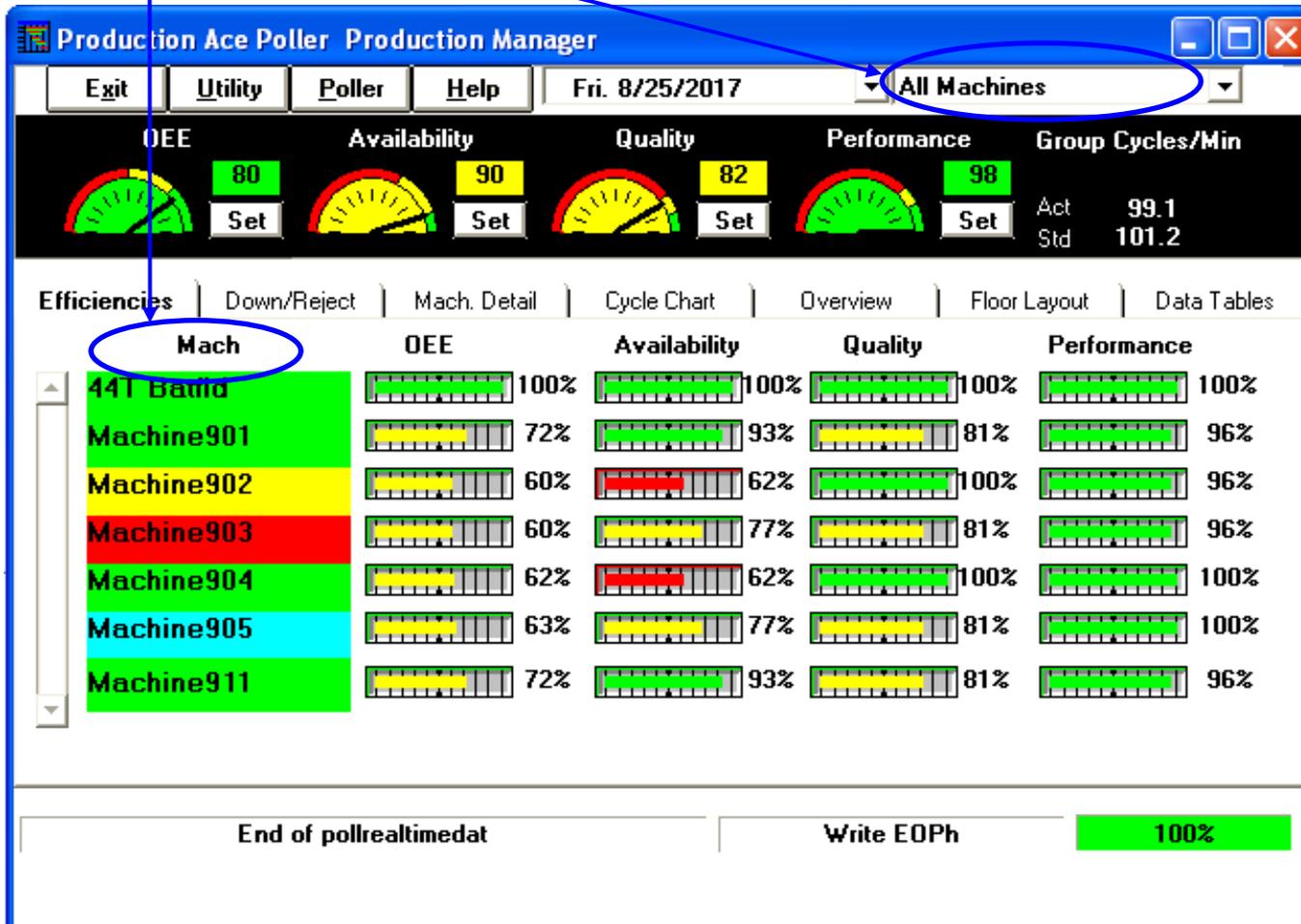
## Pareto Down time



Use standard, but sophisticated Excel tools like Pivot Tables to summarize and analyze data.

Identify problems fast, before quality suffers, with real-time OEE displays.

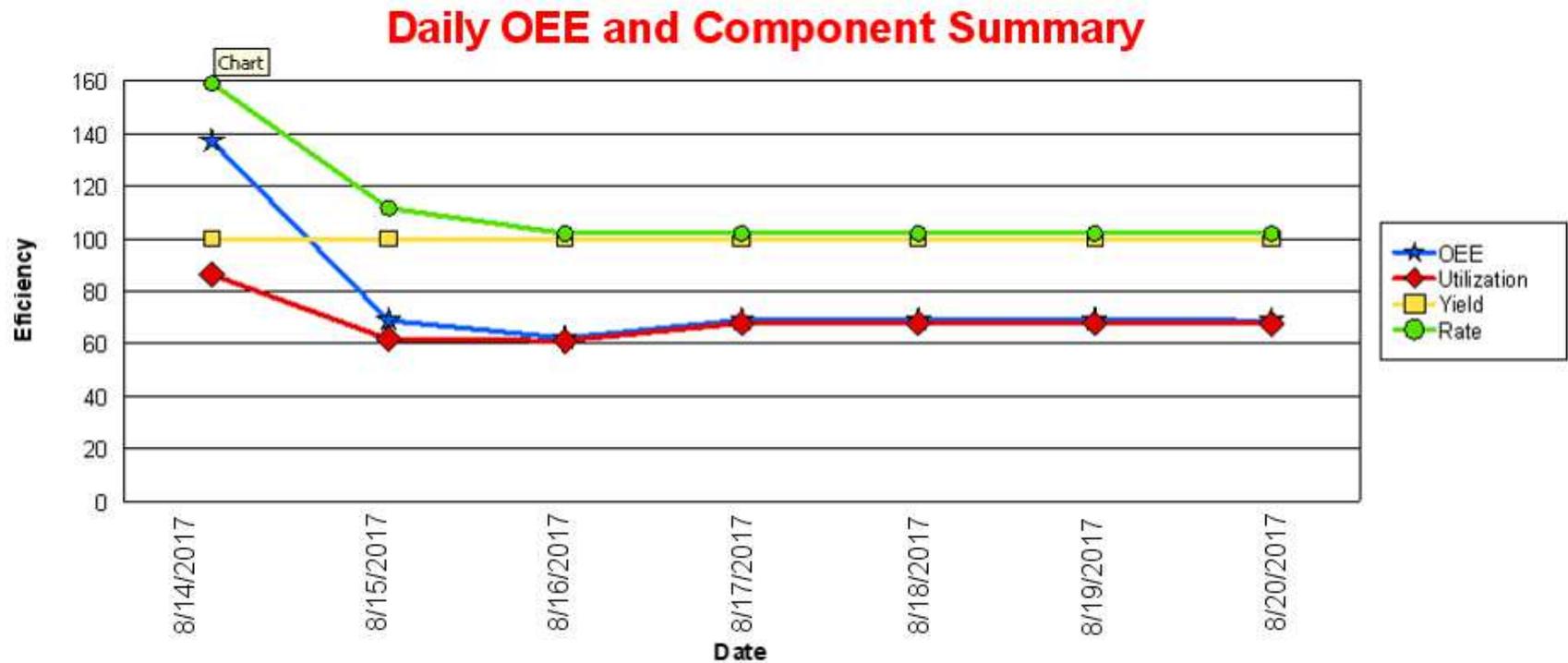
Track OEE, and its components: Availability/Utilization, Yield/Quality and Performance/Std Rate of individual machines, all machines, or a department/group.



Establish benchmarks, set standards, then track your progress with analytical tools.

Historical data can be viewed by user-selected date range... from a day to years.

Charts/reports can be run for a single machine, a department, or the entire plant.



# Analyze OEE and production performance with Excel and Crystal Reports.

- \* Wide choice of selection criteria.
- \* Use standard reports, or make your own with Crystal Reports.
- \* Export to Excel or other applications.
- \* Sorting control for multiple levels: For example, by Date, Shift, Product, Machine, Material, etc.

Printed 8/25/2017 at 16:47		SUMMARY.M.RPT: test										Page 15			
From All to All		Sorted by Shift Date; Shift Number; Machine Number													
<u>Machine</u>	<u>Date</u>	<u>Shift</u>	<u>Product ID</u>	<u>Work Order</u>	<u>Lot num</u>	<u>OEE</u>	<u>Run Hours</u>	<u>Down Hours</u>	<u>Avail.</u>	<u>Shift Parts</u>	<u>Shift Rejects</u>	<u>Quality</u>	<u>Std. Units /Min.</u>	<u>Shift Units /Min.</u>	<u>Perform.</u>
<b>Machine Number = 2</b>						<b>0.0</b>	<b>0.00</b>	<b>10.50</b>	<b>0.0</b>	<b>0</b>	<b>0</b>	<b>0.0</b>			<b>0.0</b>
<b>Shift Number = 1</b>						<b>38.7</b>	<b>7.08</b>	<b>13.33</b>	<b>34.7</b>	<b>142</b>	<b>0</b>	<b>100.0</b>			<b>74.3</b>
<b>Shift Date = 3/14/2016</b>						<b>38.7</b>	<b>7.08</b>	<b>13.33</b>	<b>34.7</b>	<b>142</b>	<b>0</b>	<b>100.0</b>			<b>74.3</b>
Press1	3/15/16	1st	0.5 Inch Single Ply	ONT4/18/16		88.7	1.82	0.53	77.4	38	0	100.0	0.300	0.343	114.5
Press1	3/15/16	1st	0.5 Inch Single Ply	ONT 3/15/1		93.5	6.06	1.52	79.9	127	0	100.0	0.300	0.351	117.0
<b>Machine Number = 1</b>						<b>91.9</b>	<b>7.88</b>	<b>2.05</b>	<b>79.4</b>	<b>165</b>	<b>0</b>	<b>100.0</b>			<b>115.7</b>
Press2	3/15/16	1st	Unscheduled			0.0	0.00	10.50	0.0	0	0	0.0	0.000	0.000	0.0
<b>Machine Number = 2</b>						<b>0.0</b>	<b>0.00</b>	<b>10.50</b>	<b>0.0</b>	<b>0</b>	<b>0</b>	<b>0.0</b>			<b>0.0</b>
<b>Shift Number = 1</b>						<b>44.6</b>	<b>7.88</b>	<b>12.55</b>	<b>38.6</b>	<b>165</b>	<b>0</b>	<b>100.0</b>			<b>77.2</b>
<b>Shift Date = 3/15/2016</b>						<b>44.6</b>	<b>7.88</b>	<b>12.55</b>	<b>38.6</b>	<b>165</b>	<b>0</b>	<b>100.0</b>			<b>77.2</b>
Press1	3/16/16	1st	0.5 Inch Single Ply	ONT 3/15/1		33.4	0.70	1.66	29.7	14	0	100.0	0.300	0.338	112.6
Press1	3/16/16	1st	0.5 Inch Single Ply	3/16/16		74.5	4.88	2.54	65.8	99	0	100.0	0.300	0.340	113.3
<b>Machine Number = 1</b>						<b>64.5</b>	<b>5.58</b>	<b>4.20</b>	<b>57.1</b>	<b>113</b>	<b>0</b>	<b>100.0</b>			<b>113.0</b>

## Visual Factory Displays: Inform, empower, motivate operator with Andon Displays at individual machines.

Optional “intelligent” TV Displays are low cost OEE/productivity scoreboards. More capable and *much less expensive* than LED-style Andon Systems that typically cost \$3000 or more. Many standard display formats are available, or build-your-own with a simple software tool we supply.

Call for details and pricing at 603-434-2300.



## Notify managers to potential issues with real-time e-mail “alerts”.

E-mail notifications can be automatically generated to identify actual or potential problems on the production floor. Selecting reasons to generate e-mail is a simple check-the-box process. (This screen is typical, many other trigger reasons are provided).

E-mail address	Poller Down	Help Call	Down/Reject Reason	Shift Sched Change	Parts/Stroke change	Low Alarm	High Alarm	Down Reason	OEE low	Shift	Reject Reason
tim@productionprocess.com	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	6	<input type="checkbox"/>	<input checked="" type="checkbox"/>	5
dave@productionprocess.com	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	7	<input type="checkbox"/>	<input type="checkbox"/>	0
John@productionprocess.com	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	0	<input type="checkbox"/>	<input checked="" type="checkbox"/>	0

Typical reasons that trigger e-mail alerts:

- \* Help call: the e-mail will specify the particular machine requesting the help call.
- \* Down/Reject Reason occurrence: any time a specific Down or Reject Reason occurs.
- \* Fast/Slow Rate or Cycle Time: whenever the machine is operating outside limits.
- \* OEE deviation: if machine, group of machines or department OEE is below user-set limit.
- \* Shift Schedule change: any time the shift schedule is changed.
- \* Parts-made-per-cycle change: for example, if a mold cavity has been closed off.

Customizable, [web-enabled displays](#) provide plant wide, enterprise wide real-time data visibility onto any production floor.

Users can “point and click” to develop their own screens (and reports) like this.

2017-Aug-25 10:21:05

Machine Number	Machine Name	Hours To Go	Run Time	Run Time	Shift Number
1		0	67	67	1
4	n/f	0	0	0	2
5	n/f	0	0	0	2
6	n/f	0	0	0	2
11	acer	0	457	457	1
15	A5_15	-39.65	303.6	303.6	3
24	B4_24	1.18	13.3	13.3	1
101	101	-0.65	0	0	2
102	102	2.61	0	0	2
103	103	1.12	0	0	2
104	104	4.16	0	0	2
143	D3	48.75	185.2	185.2	1
144	"D4"	19.78	187.9	187.9	1
223	"L3"	-13.13	172.2	172.2	1
226	"L6"	-47.42	133.5	133.5	1
901	Machine901	51.97	27.5	27.5	2
902	Machine902	0.01	7	7	2
903	Machine903	51.62	21.1	21.1	2
904	Machine904	4.15	12.1	12.1	2
905	Machine905	871.4	18.7	18.7	2
907	Machine907	-0.71	46.1	46.1	2

Machine Status:  
 Green: Running in limits  
 Yellow: Slow  
 Blue: Unscheduled  
 Red: Down

# Give your customers accurate delivery dates with Visual Job Queue.

The **Job Queue** provides a graphical view of production schedule and Job completion time. It continually monitors actual shop floor activity to provide an accurate Job completion date.

Drag and drop a Job to see effect on schedule: The System highlights a Job that won't meet needed date, or if machine or tooling is already scheduled.

From the MDT-150 or Tablet, the operator can select the next job in the queue as well as use a bar code scanner.



## Job completion calculation factors:

1. Production quantity scheduled.
2. Shift production schedule.
3. Performance of current running Jobs.
4. Machine setup/change-over time.
5. Machine and Job-specific efficiencies.
6. Maintenance schedule.

## Interface to any ERP/MRPII system.

ERP downloads production requirements into each machine's Job Queue. At Job or Shift end, production and productivity data is exported to ERP.

Mach	To Go	JobToMach	Save All	Refresh	1 Week	
1500 Ton	14.1	New Product				Cap400
Machine900	12.2	Cap200				Cap400
Machine910	223					Cap300
Machine920	0.64	Cap200				
Machine930	14.0	1234				
Machine940	91.5	Cap450				
Machine950	607					Cap300

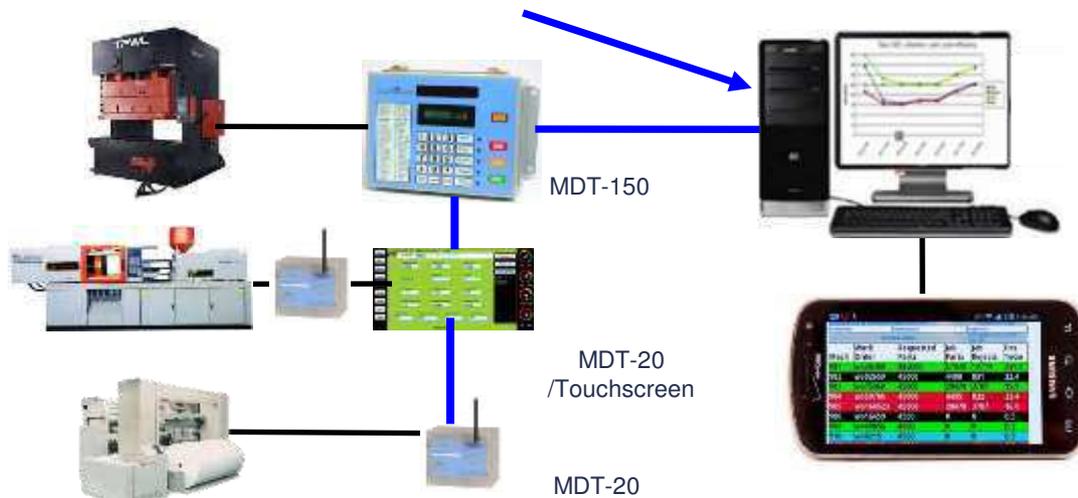
  

	08:18	10/11/00	10/12/00	10/13/00	10/14/00	10/15/00	10/16/00	10/17/00	10/18/00	10/19/00
(Default)	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Unassigned Jobs	Cap 400	WorkOrder3	-----	-----	-----	-----	-----	-----	-----	-----
Sorted By:	Cap300	MainProd	-----	-----	-----	-----	-----	-----	-----	-----
ProdID	Cap400	newweek	-----	-----	JOHNS TOOL	-----	-----	-----	-----	-----
	New Product	MyOrder	-----	-----	-----	-----	-----	-----	-----	-----

Unassigned job: New Product MyOrder -----

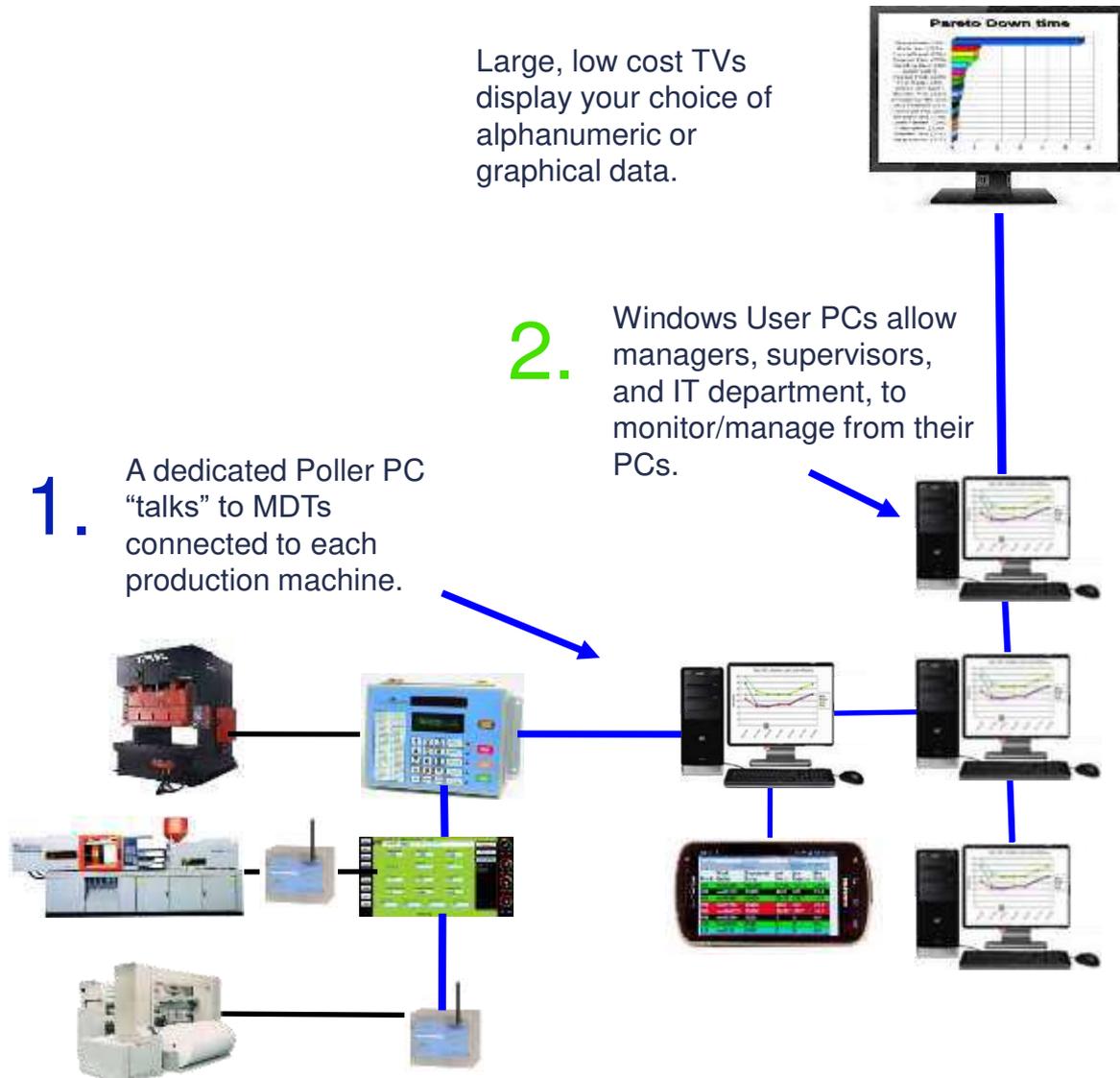
System architecture makes real-time manufacturing operations visibility and integration with Enterprise applications as simple as 1 – 2 – 3.

1. A dedicated Poller PC “talks” to MDTs connected to each production machine via wired or wireless Ethernet.

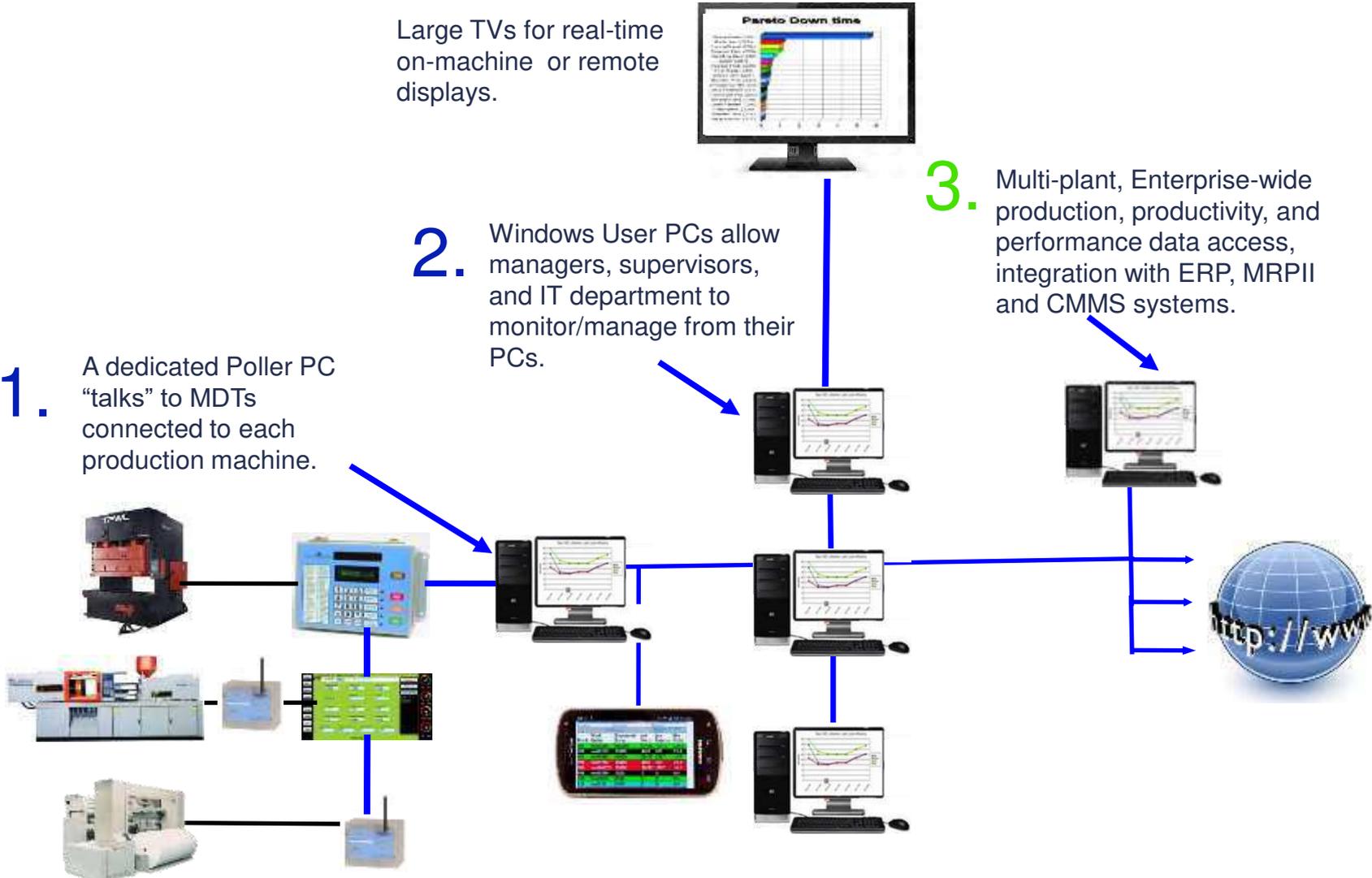


Mobile access via smartphone.  
Also “alert” e-mails are automatically sent

System architecture makes real-time manufacturing operations visibility and integration with Enterprise applications as simple as 1 – 2 – 3.



# System architecture makes real-time manufacturing operations visibility and integration with Enterprise applications as simple as 1 – 2 – 3.



Use the **MDT-20** when no operator interface is required and you need wired or wireless Ethernet communications.



← 5 inches →

### **MDT-20 has four Machine “Signal Input” connections:**

One input is connected to machine cycle signal. This input should be momentarily activated each time one or more Parts are made/processed.

One input is used for direct input of Reject Part counts. Can be from automatic inspection/reject station.

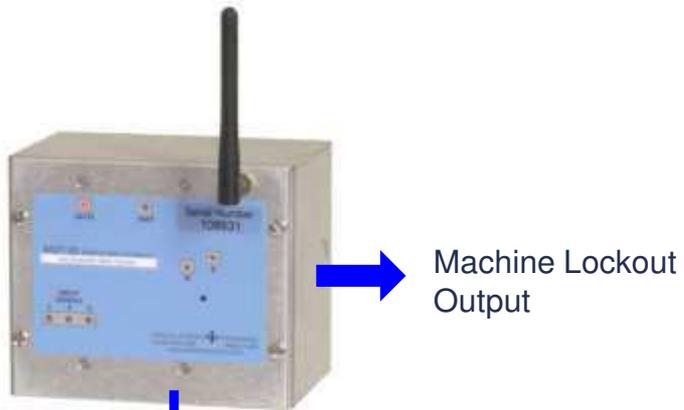
One input can be configured as end-of-line Totalizer /Case Count or automatic Reject input. If you don't have a direct Reject Part Input, the system can track Rejects by recording difference between Parts made and the Totalizer/Case Count.

One input senses when the machine is powered down. This downtime is tracked as a separate Reason from machine powered up, but not cycling downtime.

Installation is economical: Device is powered by machine power (120V or 220V AC) and records downtime when machine is off.

Plant Floor Communications to central system Poller PC: wired or wireless Ethernet.

## Tablet PC Operator interface expands MDT-20 functionality



### Expand MDT-20 functionality with a low cost Tablet PC Operator Interface.

- \* Operator enters 20 Reasons for Downtime.
- \* In addition to and automatic Reject input on MDT, Operator enters 20 Reasons/Counts.
- \* Select next Job in Job Queue from Tablet, or with Bar Code wand.
- \* Entering Non-Scheduled Mode—need for OEE.
- \* Track Setup time. MDT can track Parts made in Setup as rejects.
- \* Real-time OEE display including “components” Availability, Performance, Quality
- \* Log on Operator and Maintenance staff to track their performance.
- \* Machine Lockout is activated when machine goes “down” to ensure Operator enters Reason for down event.



## The MDT-150 operator Interface has many features and functions.

Operator can enter through keypad:

- \* 40 Reasons for Downtime
- \* 20 Reasons and quantities of Rejects

Six electrical inputs for:

- \* Machine Cycle should be momentarily activated each time a Part(s)
- \* 3 inputs for direct tracking of Down Reasons.
- \* One automatic Reject
- \* One Case Count

Three or (optionally) four outputs for:

- \* Lockout machine to force Reason entry
- \* Indicate machine Fast/Slow
- \* Batch Count
- \* 3 color Light Tree (replaces Fast & Batch).

Operator uses Function keys to enter:

- \* Next Job in Job Queue from keypad or (optionally) a Bar Code Scanner.
- \* Setup Mode: MDT can track Rejects in Setup.
- \* Non-Scheduled Mode
- \* Operator Help Call
- \* Log on Operator and Maintenance staff to track their performance.
- \* Lot Number



10 inches

MDT enclosure is heavy gauge steel.

# The MDT-150 tracks 40 Down and 20 Reject reasons.

Data Function and Down and Reject Reason menu—a user-prepared listing of up to 40 Down and 20 Reject codes specific to each machine.

A total of 999 Down and Reject Reasons are available for use in System.

Operator uses “arrow” or number keys to select Data Functions to display such as:

- \* Cycle Time: last cycle and shift average
- \* Production Rate: instantaneous, average, shift average
- \* OEE and components that make up OEE: Availability, Performance and Quality.
- \* Hours to Go to finish Job
- \* Parts to Go to finish Job
- \* Rejects
- \* Run Time, Down Time, Setup Time



### Light tree for Machine status:

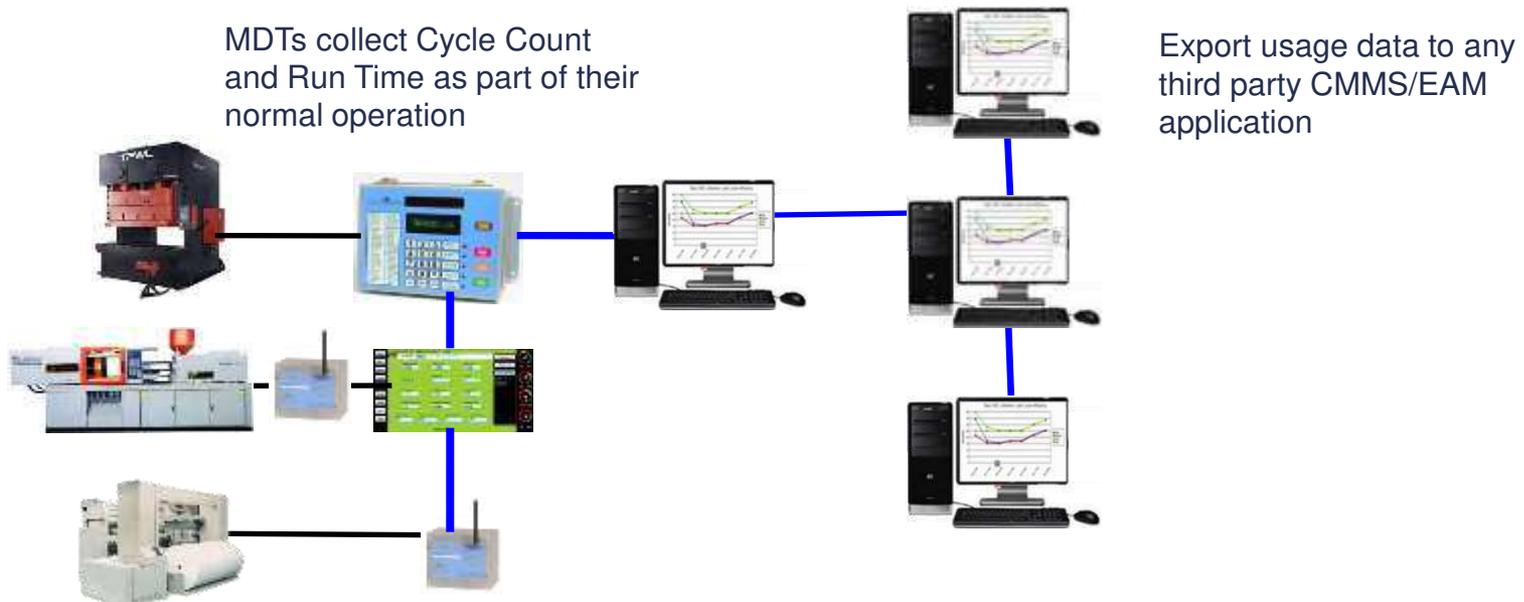
- Amber—Job changing
- Red—machine “down”
- Orange—machine fast, slow
- Green—machine operating within high and low limits
- Red and Green: In Setup

Communications to central system Poller PC is via wired or wireless Ethernet.

# Preventive Maintenance Scheduler replaces ineffectual calendar-based scheduling with usage-based Predictive Maintenance Scheduling.

PM Scheduler tracks actual Run Time and Cycle Count on machine and up to 99 individual machine components such as dies, molds and tooling, etc. System alerts users when maintenance is “near due” and “due” for machine and each component part .

The System can also export equipment Run Time and Cycle Count to any CMMS application.



Most ERP systems have a disconnect when it comes to the shop floor, but now you can link production operations to any ERP with the [Advanced ERP Interface](#).

Import ERP production schedule into ProductionACE Job Queue, then track Job progress in real-time at each machine.

- \* Simplify and improve Production Scheduling performance.
- \* Maintain accurate Finished Goods and WIP counts.
- \* Provide accurate delivery dates.
- \* Track raw material usage.
- \* Detect slowdowns, stoppages before productivity suffers.

At end of Shift and Job, export actual production and performance data to ERP.

- \* Eliminate error prone, manual data collection and data entry.
- \* Improve Product Costing accuracy.



ERP

A direct link to ALL types of manufacturing machinery.

**Please contact us for a “live” system Web demo or more  
information.**

(603) 434-2300

info@productionprocess.com

**www.productionprocess.com**

