KNOWLEDGE BINDER –

PRODUCTVITY STATION™

Written by Jesse Benefiel.

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KNOWLEDGE BINDER –

PRODUCTVITY STATION™

WHY SHOULD YOU SELL THE PRODUCTVITY STATION?

Kaizen, lean manufacturing, six-sigma, total quality management, continuous improvement – All of these terms refer, in some form or another, to the efforts of companies as they strive to become more competitive in a global economy. While various strategies are implemented in order to improve productivity, they all have two things in common – the collection of KPIs – key performance indicators – and the communication of those KPIs to the people who can most affect improvement – the production floor personnel.

Over the years, methods for collecting and communicating KPIs have evolved considerably. Early on, data was collected by a person with a pencil, a stop watch and a clipboard, which was then transferred to large chalkboards. Chalkboards gave way to electronic counters and panel meters with large LED displays, such as Red Lion's own LD series. These devices offered the ability to see KPIs over great distances, but were only of value if the KPIs could be measured directly by the sensor. Eventually, multi-color, graphical marquees replaced simple displays, and the more advanced models could even perform number crunching on the sensor data, allowing them to display ratios, track time, etc. Red Lion's DSP, when combined with a PFM – Plant Floor Marquee, is such an example.

Within the last few years, the rapidly falling prices of consumer-grade LCD TVs have gained the attention of many customers interested in industrial signage. Of course, the flat screen TV wasn't designed with productivity in mind[1], and it therefore lacks any ability to gather plant floor data. Customers, and indeed a few suppliers, have figured out various methods of getting the data to the TV, but it's usually a complex connection involving PCs, SCADA software, OPC servers, and IT personnel(!)

Red Lion's ProducTVity Station, in contrast, was born of the factory floor, and makes simple the tasks of connecting, collecting and analyzing machine data. The ProducTVity Station represents the only ready-to-deploy productivity display solution that leverages the low cost of today's TVs. Simply put, the ProducTVity Station will be a game-changer in the productivity display market.

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[1] Surveys show that 5 out of 5 spouses agree.

IS THIS A NEW MARKET FOR RED LION?

You may be surprised to hear that we've been in the productivity display market for several *decades*, and that *you* have probably sold numerous of these continuous improvement tools from Red Lion. Have you ever sold one of the following?

LDD – LARGE DIGIT DISPLAY – RELEASED 1990

LMC – LARGE MESSAGE CENTER – RELEASED 1992

LDX – LARGE DIGIT DISPLAY – RELEASED 2006

All of the above are, or were, offered in small sizes, but the customers chose the largest versions so that the information was visible plant wide, ergo, they were simple productivity displays. Even today, the large digit LED display market is growing quite nicely.

What's different with the launch of the ProducTVity Station is that we're "calling a duck a duck". That is to say that we're treating the product as a tool to enhance productivity, rather than just pitching the concept of a large display.

SELLING PRODUCTIVITY

Let's take a step back for a moment, and discuss what you're really selling, which is *productivity*. Granted, if you call on someone who already uses production monitors, it's obvious they understand the benefit – you may simply cut to the chase and show them why the ProducTVity Station is superior to what they've previously seen. However, most of your customers probably haven't considered the use of large displays as a means to improving productivity. In these situations, you'll find yourself faced with explaining the concepts and value of continuous improvement as it relates to the communication of KPIs to manufacturing personnel – in other words, you've got some selling to do long before the hardware hits the conference table.

CONTINUOUS IMPROVEMENT

In the mid-1970s, Toyota pioneered a new philosophy in production management, which resulted in the Toyota Production System. This new system of management strived to improve all aspects of business, with a wide-reaching goal "to design out overburden (muri) and inconsistency (mura), and to eliminate waste (muda)."[2] In the mid-80s, Motorola introduced their own management strategy, known as Six Sigma, with the same intent – improving quality and driving out waste (and to seemingly create a new species of consultant).

Since this author isn't experienced in the application of TPS, and doesn't hold a black-belt in Six Sigma, we'll not focus too heavily on any one business philosophy – suffice to say both quality processes caused other manufacturers to take notice, and more are adopting what is generically referred to as continuous improvement. What we will focus on is the value that large industrial displays provide as tools within every continuous improvement initiative.

KEY PERFORMANCE INDICATORS

All continuous improvement initiatives have at least two things in common – the benchmarking of processes, and the communication of those benchmarks to a wide audience. After all, you can't determine if the changes you've made to a process have improved on it, or indeed hindered it, unless you record its performance over time. Of course, the data doesn't do any good unless everyone can see it, particularly those that are responsible for it, and those that are judging other's performance based on it.

Having key performance indicators on display allows the operator(s) to take pride of ownership in their contribution to the company. (The more cynical view would be that it ousts those that aren't contributing.) Further, studies have shown that productivity improvements can be realized simply by displaying *any* information that an individual can impact, even if they don't fully understand the metric being displayed – knowing that their performance is being measured is enough to improve efficiency. This phenomenon is sometimes referred to as the Hawthorne effect[3], though this author remains convinced that nothing more mysterious than our competitive nature is to blame, i.e. "That guy on line 9 can't produce as many

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[2] http://en.wikipedia.org/wiki/Toyota_Production_System

[3] http://en.wikipedia.org/wiki/Hawthorne_effect

widgets as I can – you just watch!" Regardless of the reason behind the effect, measuring and displaying KPIs is critical to continuous improvement. They magically increase production, while illuminating which areas are most in need of improvement.

The KPIs that are most important to your specific customer will vary – there are potentially hundreds of values a company could want to display. Examples of common KPIs used in manufacturing are…

COUNT – TOTAL, GOOD PRODUCT, BAD PRODUCT, ETC.

Customers frequently want to know how many widgets they've made, and usually they also want to know how many of those were bad, or faulty.

REJECT RATIO

If the customer is counting the number of bad widgets, they'll most like want to know what the reject ratio is of a given line, or shift.

RATE(S)

How fast are we making widgets, e.g. widgets per minute, or hour?

SHIFT TOTALS

In many production settings, each worker on the line has a different function, making it difficult to compare the output of one employee with another. In these cases, customers can opt to display information about the previous shift's output.

TARGETS

In most applications, the customer will want to display targets for each KPI so that the operators know what's expected of them. This can simply be the number of widgets required to fulfill an order, or what reject ratio the customer deems acceptable. Either way, targets are necessary to drive improvement.

TAKT TIME

Takt time is the amount of time, or cycle time, for the completion of a task. This could be the time it takes to produce a widget, but more likely is the cycle time of a specific task. Here at Red Lion, we measure the takt time of the surface mount process, the inspection, final assembly and test time.

OEE – OVERALL EQUIPMENT EFFECTIVENESS

OEE is a metric that indicates the utilization of resources. Production managers are interested in seeing the value of this metric increase, as it indicates more efficient utilization of the available personnel, machinery, etc.

The formula for OEE is `OEE = Availability x Performance x Quality`[4]

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[4] http://en.wikipedia.org/wiki/Overall_Equipment_Effectiveness

ANDON

All companies, whether or not they practice continuous improvement, want production to flow uninterrupted. Those that have created processes to ensure production flows most efficiently have adopted some form of *andon* – "a manufacturing term referring to a system to notify management, maintenance, and other workers of a quality or process problem."[5]

Andon can be realized in many forms, including notes written on paper and easel, chalkboards, etc. – I recently saw a website selling andon dry-erase boards. Simple light stacks or towers, which you've probably seen a hundred times, are one of the earliest forms of electronic andons. Mounted up high, light stacks allow everyone to see the status of virtually every machine in the room. A green light means the machine is running well, while a yellow light usually indicates the machine is running, but requires attention. A red light almost always means that the process has stopped and requires immediate attention. To get more information from a stack light, customers simply add colors or create color combinations, allowing them to see when the machine needs parts, maintenance, etc. You can probably imagine the confusion that ensues when more than a handful of colors is used, which is why many companies opt to use marquees with descriptive text instead.

Over the years, the term andon has been misused to the point of having lost its original meaning, and is now commonly used to refer to any production display, including those that display only KPIs. Of course, it doesn't really matter – programmable solutions offer the ability to play the role of production monitor and andon, all in one package. Examples of true andon messages would be "Out of parts", "Conveyor Jammed", "Contact Maintenance", and "Preventative Maintenance Required". Think of your car's normal dashboard as a KPI indicator, and the part that gives you the warnings as the andon display.

THE VALUE OF INFORMATION

Continuous improvement initiatives are employed to increase profitability by increasing quality, productivity and uptime. However, you may be surprised at the amount of money that's saved, or profit generated, from seemingly minute increases in efficiency.

WHAT'S A PERCENT WORTH?

At the beginning of most continuous improvement initiatives, low-hanging fruit is usually identified fairly quickly. However, in keeping with the initiative's continuous nature, companies consistently look for ways to increase profitability, even if it's by as little as one or two percent. Most companies that are serious about continuous improvement employ "industrial engineers", aka "manufacturing engineers", who are responsible for finding ways to improve processes by single-digit percentages.

Such small improvements may seem trivial, but consider a production line that produces $10M worth of product in a typical year. If the productivity of the line was increased just 1%, the company would realize an additional $100K worth of revenue. Seems fairly straightforward, right? However, what we mustn't forget is that the profit generated by the additional $100K in revenue can be considerably higher, as only *incremental costs* will apply

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[5] http://en.wikipedia.org/wiki/Andon_(manufacturing)

to the increased production. That's because the fixed costs, e.g. the cost of the machine, rent or taxes for the building, the worker's salaries, etc. aren't taken into consideration when calculating incremental cost.

EXTREME ANECDOTE

This author once spoke to a continuous improvement engineer who works for a well-known food company. The engineer was so proud of the results that his initiatives had achieved that he begged to show me the same presentation that he gave to his management team some months prior. In the presentation, he demonstrated that for every 1% of waste reduction, an additional $1M in profit was realized… on *each* processing line the company had, in *every plant* they owned in the United States. Needless to say, management was impressed, and gave him the proverbial blank check to implement his strategies.

As previously mentioned, a key component of any continuous improvement process is the collection and tracking of KPIs, so the engineer needed to add large marquees to every processing line. Unfortunately, no supplier offered a marquee built to withstand the rigorous cleaning this customer's process required, so he purchased an off-the-shelf marquee, and had custom stainless-steel, air conditioned enclosures built to house them. The total cost for the display and the enclosure? $24,000 each – and that didn't include the cost of installation!

SELLING VALUE – DOLLARIZING THE BENEFITS

When selling hardware, price is what matters to the customer. Sure, your good looks and charm will overcome small pricing disparities, but it's unlikely the customer will pay twice as much for your product versus the competitor's product. When selling value, you're trying to illustrate to the customer that he can increase his profitability by buying your product. This approach causes the customer to compare your solution's cost against the potential savings or extra revenue generation. Stated another way, you're illustrating to the customer why they can't afford to NOT buy your product.

To help the customer come up with the numbers, you may have to ask probing questions such as…

- *How many widgets/feet of material/gallons of X does this line produce in a day/month/year?*

- *Can you share how much revenue the line/machine generates per year?*

While your customer may not be comfortable sharing financial data, they will most likely tell you how much product a line produces, and once you have that information, you're in a position to determine what a one, two or three percent increase represents. The good news is that it's almost always a BIG number.

Based on the production data given, probe the customer to determine if they're considering areas for improvement, or if they possess sufficient knowledge to improve upon a processes' performance. Consider asking the following questions…

- *Do you know how much you produce today?*

- *Do particular lines, or manufacturing cells, produce more than others?*

- *Do particular employees or shifts produce more than others?*

- *How often, and for how long is the machine or process stopped?*

- *Why is the machine or process stopped?*

If the customer doesn't know the answers to all of the above, that's OK. The ProducTVity Station can help them find the answers. If they don't care to know the answers, you're probably talking to the wrong person.

TARGET AUDIENCE

As the savvy reader will have determined, getting to the proper contact within an organization is important when promoting the benefits of the ProducTVity Station, as not everyone has time to consider areas for improvement. Consider the following positions, and remember to analyze their goals, as well as the difficulties they face in their daily tasks.

MANUFACTURING OR INDUSTRIAL ENGINEERS

This is, by far, the best group of candidates for the ProducTVity Station. After all, they're the ones directly responsible for increasing efficiency, decreasing downtime, etc., through continuous improvement initiatives. Many will have been formally trained or earned degrees on the subject, and can tell you with amazing accuracy and detail the ROI of any proposed expenditure, on any process in their facility – all without an iPhone app!

This author once bumped into a six sigma black belt at a company picnic, and it was obvious that he loved his job. He could – and to my dismay, tried to – explain the impact of every initiative he undertook in the last year, what the efficiency gains were, and what savings it represented to his employer. Unfortunately, we didn't have a ProducTVity Station to sell him at that time, so after 30 minutes of listening, I backed away from him at an imperceptibly slow pace, until I disappeared back into the crowd.

I can't blame the gentlemen in the aforementioned anecdote for wanting to share his story – we all enjoy explaining what we do, particularly when we're as good at it as he was. I'm using the story to illustrate that industrial/manufacturing engineers know the accounting details of manufacturing. Look for people in these positions, and find out what initiatives they're currently working on.

This group doesn't have to be sold on the value of incremental improvements, so you'll want to determine what challenges they face in regard to the creation and tracking of KPIs. Questions for this group might be as follows…

- *Do you have equipment that's not being tracked? Why?*

- *What challenges do you face in regard to collecting and displaying KPIs?*

- *Do you have an economical means to record the data?*

- *How long does it usually take to deploy systems for collecting process data, and what departments must be involved?*

- *Has there been a difficult learning curve for the various personnel involved with the implementation of the solutions you're using today?*

This group will be interested in rapid, painless deployment of productivity systems. They'll appreciate how flexible the ProducTVity Station is, such that they can gather data from machines that have proven difficult. They'll also appreciate the ease of programming that the ProducTVity Station offers.

MAINTENANCE ELECTRICIANS & AUTOMATION ENGINEERS

Most of us spend our time calling on electricians and automation engineers, and some will indeed be interested in the ProducTVity Station. However, a good percentage won't be interested in increasing the company's profitability. There's nothing wrong with that mentality – a wise man[6] once taught me that to understand a man's motivation, you must first figure out how he is paid, and many electricians simply aren't paid to do anything but preventative maintenance and repair of the machines. However, they too have pain that the ProducTVity Station can resolve. Ask the following…

- *How often does the machine or process stop? Why?*

- *What's the cost of each stoppage? Aggregate?*

- *How often do the same problems occur?*

- *Could communicating the occurrence, as well as the reason for a stoppage, on a large display allow a quicker response, thereby minimizing downtime?*

- *Are there improvements that you'd like to implement, but are struggling to justify their cost? Would tracking the frequency of failures and the associated costs help you?*

- *What happens if the operator allows the machine to run out of materials? How long are they down for? Does the "batch" have to be scrapped? What's that cost?*

- *Does the operator ever fail to notice that the machine is running out of spec? Does it damage or stop the process? What's that cost?*

- *Is the operator sometimes too far away from the control panel to see what's going wrong?*

- *Does your boss gripe about the downtime?*

Even if continuous improvement isn't a concern for this group, they'll probably be interested in performing their job better and faster. The ProducTVity Station can provide them information about their equipment, allowing them to reduce, and even avoid, downtime.

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[6] Who am I kidding… he probably read it on the Internet.

PRODUCTION/OPERATIONS MANAGERS & OWNERS

Depending on the size of the organization, you may have to go "to the top" before you find someone who cares enough about productivity that they're willing to spend money in order to improve upon it. Questions for this group are simply a collection of all the previous questions, and if they don't know the answers, you can be sure it will bother them – managers and owners simply can't operate without data, and the "unknown" tends to scare the bejeebers out of them!

BUT HOW DOES IT WORK?

Hopefully by now you understand a bit about how KPIs and andon messaging can benefit your customers. Read on to discover why the ProducTVity Station represents the only ready to deploy solution for collecting, recording, and communicating critical KPIs and andon messages on off-the-shelf TVs, monitors and projectors.

## COLLECTING DATA – CREATING KPIS

Unlike other solutions, the ProducTVity Station can collect data from automation components, such as PLCs, drives, etc. via communications, as well as from existing sensors. Direct communications is supported with over 200 communications protocols, realized by three-built in serial ports, and an Ethernet port capable of communicating 10 protocols simultaneously. An expansion port allows customers to add more serial or Ethernet ports, as well as various fieldbuses such as DeviceNet and Profibus.
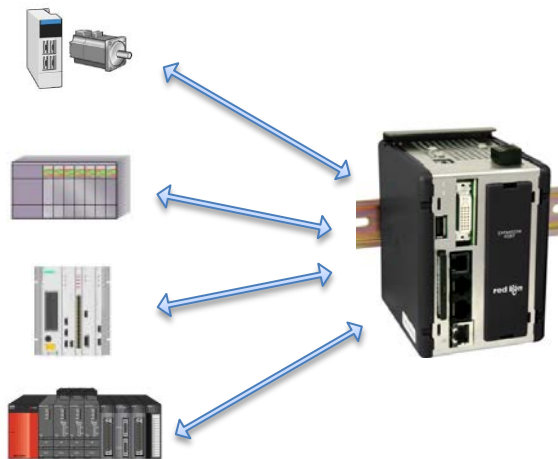
With over 200 communications drivers, the ProducTVity Station can collect data directly from devices such as PLCs, drives, bar code scanners and more.

For connection to sensors, the ProducTVity Station can be expanded with the addition of CS modules. Various modules including analog and digital input, strain gage, thermocouple and RTD input provide the ability to connect to virtually any sensor. With its ability to perform 32-bit floating-point math, the ProducTVity Station can use the collected data to create KPIs such as efficiency, estimated time to goal, etc.

The CS series modules allow the ProducTVity Station to monitor sensor inputs directly.

RTD, THERMOCOUPLE, DIGITAL, ANALOG
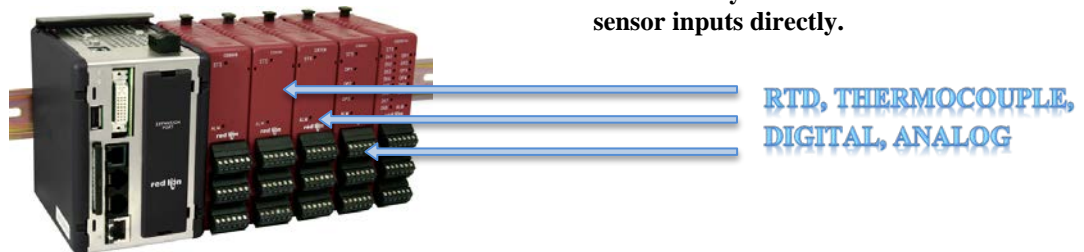
TRACKING

If KPIs are being measured and displayed, you can bet that the customer will want to track them over time. The ProducTVity Station provides tracking with its built in data logger, which can record any and all information to a CompactFlash card in simple, IT-friendly CSV file format. This format is ideal, as it is easily read by personnel, and can be automatically imported into virtually every type of database.

The ProducTVity Station also features automatic synchronization tools, allowing the CSV files to be periodically sent to any FTP server for long term storage. The unit's SQL Sync service provides seamless synchronization with Microsoft's SQL Server. Even if the company doesn't have an MES – manufacturing execution system, they may appreciate knowing that the ProducTVity Station has the ability to integrate with one as their business grows, and their IT needs evolve.
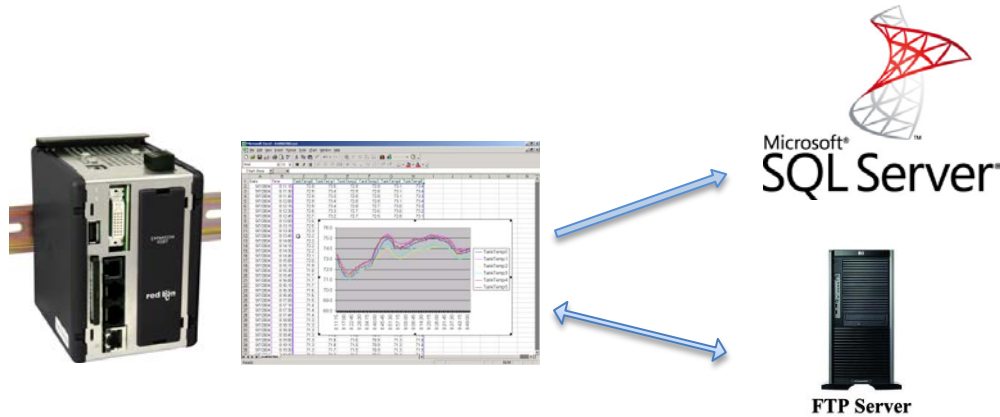

**The ProducTVity Station logs data in IT-friendly CSV file format,
and can synchronize with FTP servers, as well as MS SQL Server.**

ANDON MESSAGING – HERE, THERE, EVERYWHERE

Remember, andon is the process of communicating issues to the appropriate personnel, so that a quick response can be realized. A fast and appropriate response minimizes the impact of the issue, and will reduce, or avoid altogether, the cost of the downtime that may result. The most common form of andon is the use of simple stack lights, but the trend has been towards devices that display descriptive messages – those solutions are fairly straightforward, and Red Lion has provided LED message displays for over 15 years.

In contrast, the ProducTVity Station can not only provide local andon messages, it also extends the messaging to remote users. The ProducTVity Station's Mail Manager allows the customer to create lists of contacts to be notified in the event of an issue, and will manage the notification of those contacts via SMS text message and email. If the recipient wants to check on the system remotely, the ProducTVity Station's built-in webserver allows them to access the machine's status via their PC or smartphone. In some cases, the ability to investigate the issue remotely will actually allow on-call personnel to remedy the situation without having to visit the site!
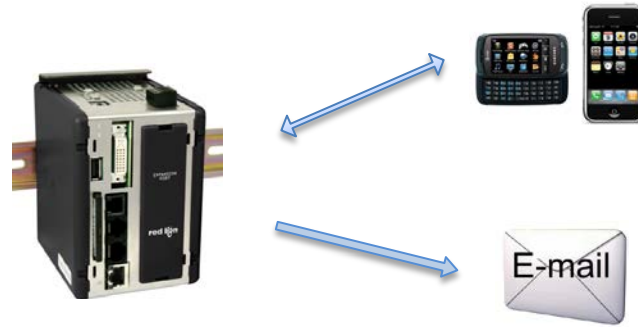
The ProducTVity Station's Mail Manager allows notifications to be sent to one or several recipients via text message and email.

WHAT ABOUT THE DISPLAY?

Most of our competitors in the KPI/andon space sell multi-color LED displays, or highly customized LCD products. The ProducTVity Station is unique in that it provides a simple 720p DVI output, which allows our customers to leverage the rapidly falling prices of LCD TVs. A quick check of Best Buy's website shows that a 47" LCD can be had for as little as $600, and no one knows when we'll hit the pricing floor.[7]

For customers that want a REALLY BIG display, the ProducTVity Station can be used to drive a PC projector. However, this author cautions you on recommending any particular brand, as projectors are still fairly expensive, and manufacturers have yet to develop a bulb that lasts as long as many customers would expect. Of course, the rapid development of LED technology will probably render my concerns moot in the not-too-distant future!

You may be wondering why we chose 720p, rather than 1080i, which is the standard for high-definition TVs today. Simply put, 720p provides more than enough resolution and clarity to create remarkable looking KPI/andon displays, and 1080i support would've added unnecessary cost to the product. TVs automatically upscale a 720 image to 1080, so you need not worry about compatibility issues.

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[7] By the time this Knowledge Binder sees the light of day, $600 for a *little* 47" might look like a rip off!

REMOTE ACCESS VIA WEB SERVER

In many circumstances, your customers will want to keep an eye on their processes from within their office, and some may not have the room for an extra monitor or TV. Others will want the ability to view production information remotely, whether from home, on the road, or from their favorite golf course.

The ProducTVity Station's built in webserver provides the ability to remotely view its display from any web-enabled device, including smart phones. If the size or resolution of the device doesn't allow convenient viewing of the ProducTVity Station's primary display, simplified "data-only" pages can be created. For the ultimate in customization, the user can create HTML web pages, to be stored on, and served from, the ProducTVity Station's CompactFlash card.

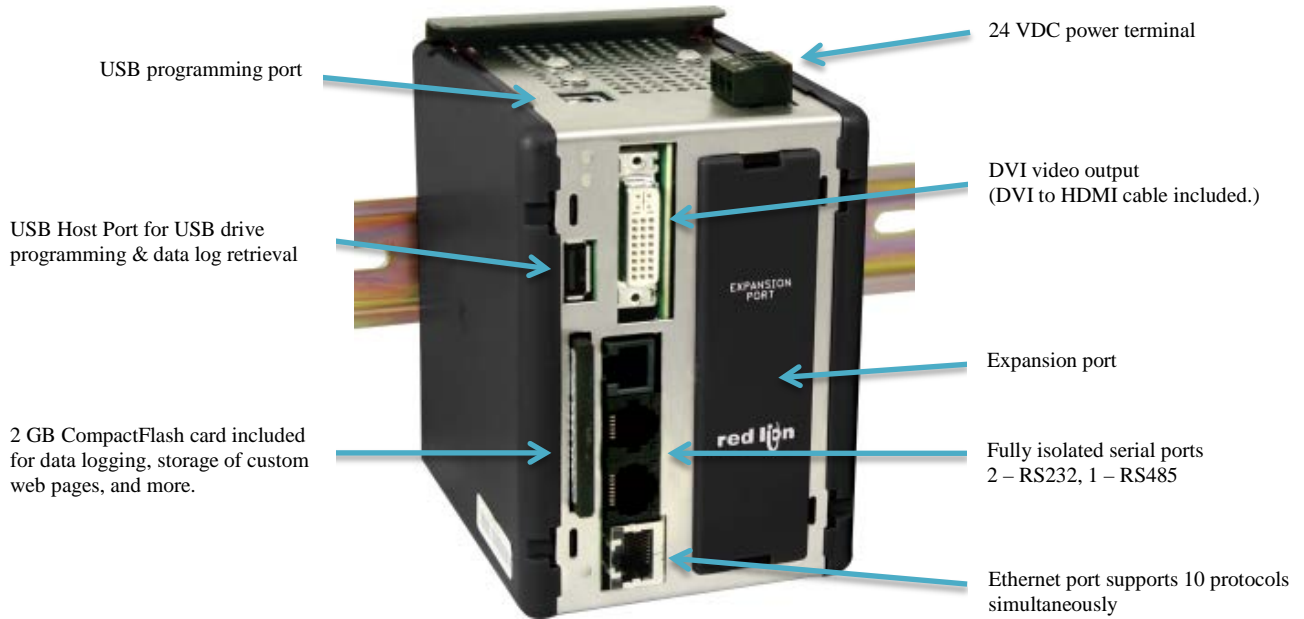If enabled, the user can modify values, or take full control of the equipment.

PROGRAMMING

The ProducTVity Station is programmed via Crimson 3.0, the same intuitive tool used to program our successful G3 series of HMIs, the Data Station Plus and the Modular Controller. Your existing customers will be pleased to know that this same powerful software platform is at the heart of the ProducTVity Station.

Customers that have yet to experience Crimson will be delighted at how quickly and easily they can collect, analyze, and display KPI and andon information. From its drag and drop data mapping, to its built in graphics library, Crimson is unlike any other productivity visualization tool.

HARDWARE – THE TECHNICAL STUFF

MUG SHOT

The below image describes the various ports and interfaces of the ProducTVity Station.

USB programming port

24 VDC power terminal

DVI video output
(DVI to HDMI cable included.)

USB Host Port for USB drive
programming & data log retrieval

Expansion port

2 GB CompactFlash card included
for data logging, storage of custom
web pages, and more.

Fully isolated serial ports
2 – RS232, 1 – RS485

Ethernet port supports 10 protocols
simultaneously

THE PRODUCTVITY STATION – WHAT'S INCLUDED

The ProducTVity Station comes with everything that's required for many customers to create
a working system. The kit ships complete with the following components…

**The
ProducTVity Station**

**A 2GB CompactFlash
card is included**

**The 10 foot long DVI
to HDMI cable allows
customers to connect to
televisions.**

**An HDMI to DVI
adapter is included,
allowing customers to
connect to a PC
monitor for application
development at their
desk.**

OPTIONAL EXPANSION CARDS

The capability of the ProducTVity Station can be extended with one of the following XC expansion cards. See the product data sheets for exact part numbers and details.

Model	Functionality
XCGSM	GSM/GPRS cellular modem
XCENET	Secondary Ethernet port
XCRS	Adds one RS232 and one RS485 port
XCCN	CAN interface – supports CANopen or J1939
XCPBDP	Profibus DP slave interface
XCDN	DeviceNet slave interface

OPTIONAL I/O MODULES

The ProducTVity Station supports up to 16 CS series modules, allowing it to accept various digital and analog signals. See the product data sheets for exact part numbers and details.

Model	Functionality
CSDIO14x	Eight input, six output digital module
CSINI8xx	Eight input DC current module (0-20 mA)
CSINV8xx	Eight input DC voltage module (+/-10 V)
CSRTD6xx	Six input RTD module
CSTC8xxxx	Eight input thermocouple module
CSPIDxxx	*Single and dual loop PID module
CSSGxxxx	*Single loop PID module, single or dual strain gage inputs

* While it's unlikely that customers would want their KPI/andon solution to provide PID control, there's nothing stopping them from using any of the CS series modules, including those designed specifically for PID control applications.

INSTALLATION CONSIDERATIONS

Because the ProducTVity Station uses standard DVI/HDMI signals, a range of accessories are available to expand its capabilities. As a bonus, these accessories are primarily used by consumers, and are therefore very low cost. However, it's important to first understand the interchangeability between DVI and HDMI, as it relates to the ProducTVity Station.

DVI VERSUS HDMI

There are many, many technical articles available on the internet that describe the differences between DVI and HDMI – most of which will put you to sleep. What is important to understand is that the video component of an HDMI signal is exactly the same as a DVI signal. Since the ProducTVity Station provides video only (no audio), the two signal types are *completely interchangeable* as it relates to our application. Therefore, think of them as nothing more than two different connector types.

DVI   **HDMI**

Red Lion chose the larger, bulkier connection for exactly that – its larger size is more rugged, and it provides thumb screws, which prevent the connector from rattling loose. The ProducTVity Station ships with a DVI to HDMI cable, which will support most TVs. An adapter is included to support DVI to DVI connections.

CABLE LENGTH

The maximum length of a DVI cable is specified at 16 feet, but manufacturers do make cables that are much longer. In our own conference rooms, we've combined multiple cables to achieve distances of greater than 30 feet between our overhead LCD projector and computer. The cheap cables we used initially resulted in a flickering image – when replaced with good quality cables, the image became very stable. If the customer experiences issues with even the high quality cables over long distances, he should consider using a "DVI Booster". A quick search online resulted in several products that claim to allow cable runs of 150 feet.

**DVI boosters allow signal runs of up to 150 feet.
Prices range from $99 to $199.**

Remember, the longer the signal run, the greater the chances of accidentally routing the cable near a source of electrical interference. As with any installation of low voltage DC I/O, the DVI cable should be routed away from wires that power switched circuits.

DRIVING MULTIPLE SCREENS
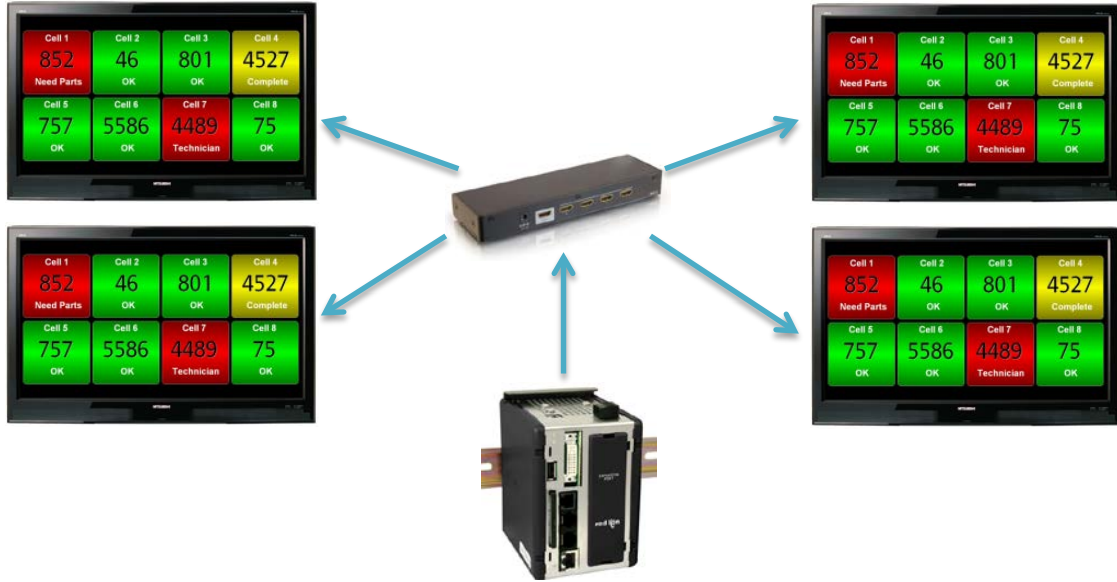
When you're displaying information as important as productivity, you want everyone to see it. In some cases, a customer's machine will be so large that they'll want a TV on each end. In other installations, the customer will want to mount two TVs, or even four, back to back, so that personnel can see the information from all sides. A simple DVI splitter resolves the issue for as little as $10. More complex, multiport splitters are available for $70 to $500+. The better products contain signal boosters, and can be cascaded to support as many as 64 TVs!

Inline splitter for simple dual-display installations.

High-end splitters drive up to four monitors, and can be cascaded to support even more.

THE COMPETITION

There are various types of displays on the market, ranging from what I'll call "scoreboard" displays that use static text and 7-segment counters, all the way to PC-based systems that use TVs as monitors. Each of these solutions has their strengths and weaknesses.

If you're new to selling KPI/andon solutions, which many of you will be, some of the competitor's names will be new to you. The lean manufacturing/continuous improvement segment has its own group of players.

DUMB LED MARQUEES

Simple LED marquees aren't in direct competition with the ProducTVity Station, but a savvy customer can indeed use them to display KPIs and andon messages. Some, like those sold by EZAutomation, are equipped with a serial, Ethernet or fieldbus port, and it's up to the customer to figure out how to control the display via PLC ladder logic commands. The PLC output string must include the text being displayed, as well as the control codes necessary to set the proper font, the color, the position, etc.

Unfortunately, EZAutomation sells the product at extremely low prices, thereby convincing some people that all LED displays should be as cheap. However, what's the customer's time worth? These are some excerpts directly from EZAutomation's brochure on their EZMarquees…

EZAutomation has at least gone to the extra effort of creating an application that helps you create the string, but how one would copy and paste that string into the PLC code would be interesting to see on the above PLC types. Further, you're limited to text only.

STANDALONE KPI/ANDON DISPLAYS

There are a few companies that offer standalone, ready to deploy product such as those offered by Vorne. These products offer convenience, as they come preprogrammed with "canned" applications. The customer simply connects a few sensors, selects the KPIs that he is interested in, and the display does the rest. Vorne's model even has a built in web server. The built-in sensor inputs allow this type of solution to provide ease-of-use and quick deployment, but it isn't as scalable and flexible as some customers will require.

IPdisplays has a unique, standalone marquee that pulls data directly from Microsoft Access, SQL Server, Oracle, etc. and supports a handful of industrial protocols. This solution works well, assuming that the customer's data is already on a PC, or is accessible via one of the few supported protocols.

PC-BASED SOLUTIONS

Several companies, such as Adaptive, offer displays along with software to control them. The software does allow you to control the displays more effectively than the aforementioned slave displays, even allowing you to include graphics. This sort of solution will require a PC, the software, and any necessary communications drivers in order to talk to a range of automation devices. Since an average OPC server costs $700-$1000 each, the total cost can add up quite quickly.

SOFTWARE ONLY SOLUTIONS

Companies like SeQent offer software-based tools for "*…real-time visualization, Andon and messaging solutions for the plant floor and the enterprise.*[8]" SeQent's servers provide the ability to crunch data, create KPIs, manage marquee displays, and can even notify personnel via cell phones and PDAs.
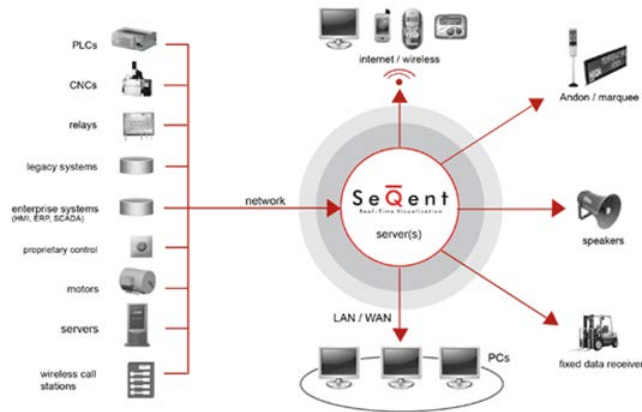
To collect data from plant floor devices, SeQent has partnered with KEPware, one of the most prominent suppliers of OPC servers. On their website, SeQent alludes to having other partners that provide hardware, such as actual LED marquees.

From what this author can determine, SeQent's offering seems ideal for larger-than-average customers – those that have the need, the budget, and the IT personnel required to deploy their software on a large scale. A quick look at their customer list certainly supports that theory: *Chrysler, Toyota, GM, Ford, Kellog's and Goodyear*, just to name a few.

STAND ALONE W/ LCD DISPLAY

The only stand-alone LCD solution this author has been able to find is the PFD – Parker Factory Display, which is programmed via their PFM – Parker Factory Manager software. The construction appears to be nothing more than a UL508 listed monitor from NEC, coupled with a DIN rail mounted PC.

Other than having UL508 and being EMC hardened, the display itself doesn't offer much over that of a regular LCD TV. It even has the same 0-40 degrees Celsius operating range of a consumer-grade TV.

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[8] http://www.seqent.com/index.php

THE "OTHER" CATEGORY

IPdisplays offers a unique solution that's worth mentioning, even if this author couldn't find a proper category name for it. Their newest device, known as the IPLCD, is the same "brain" that powers their line of marquee displays, but it provides a 720p output to directly drive a TV or monitor. Configured via the built-in webserver, the IPLCD has the same strengths and weaknesses as does their line of marquees. With its ability to pull data directly from Microsoft Access, SQL Server, Oracle, etc., the IPLCD is best suited for customers that already have their plant data contained within their MES/ERP system. The device's few supported protocols, and lack of I/O, will prevent its use in some installations.

COMPETITIVE COMPARISON

Due to the fact that no two solutions are alike, a simple price-performance matrix is almost impossible, particularly against software-only solutions. Do remember that software solutions require a programmer, or IT personnel, that have an understanding of software, networking, databases, and in some cases, programming languages.

The following chart is an attempt at normalizing the hardware-based competitors…

	Red Lion	Vorne	Vorne	IPDisplays	Parker
Offering	ProducTVity Station + any TV (TV sold separately)	XL600	XL800 (XL800-32080T shown)	IPLED Series	Plant Floor Display
Display Result	720p (1280×720), 32K color	Labels and Numbers	Graphical, three-color LED (32x80 pixel shown)	Graphical, multi-color LED (64x96 pixel shown)	LCD Monitor, 1366x768 16.7m color
Size	Any size TV 42" Diagonal (shown)	Various sizes 2.3 inch high digits shown	Various sizes 13.7" high, 26.2" wide shown	??	32", 40", 46" (46" shown)
I/O	128 digital/analog in, 96 outputs	8 digital inputs, expandable to 24, 1 output, expandable to 7	8 digital inputs, expandable to 24, 1 output, expandable to 7	??	No
Webserver	Yes	Yes	Yes	Yes	Yes
Built-in reporting tools	No, must use formulas	Yes	Yes	No	No
Communications	200+ serial & Ethernet comms drivers	Has ports for ?	Has ports for ?	Ethernet - Modbus TCP/IP, EtherNet I/P, ProfiNet	40+ serial & Ethernet comms drivers
SMS/Email Alerts	Yes	No	No	No	No
Other	Free software and support	$295 for 2-hour block of services?	$295 for 2-hour block of services?	Gets data from SQL, Access, Oracle, etc. Windows DLL - VB, C#, C++	
Price	$x,xxx + $500 TV = $x,xxx	$2,290 as shown, larger sizes available	$3,290 as shown, larger sizes available	??	Approx. $10,700
Additional Displays (Duplicate info)	$20 splitter, and $500 TV = $520	Buy another XL600.	Buy another XL800.	Buy another IPLED.	Buy a slave PFD for almost the same cost.

SELLING TOOLS

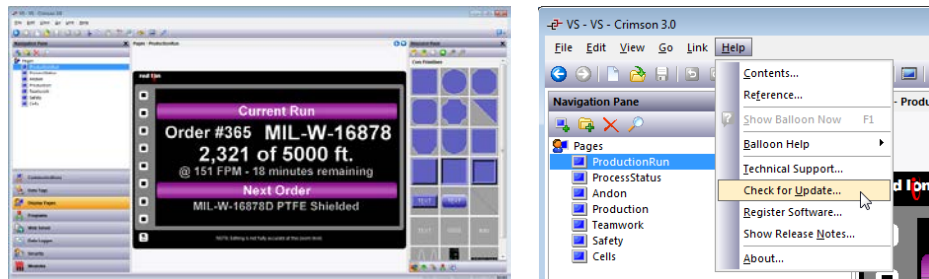Various tools are provided in order to help you sell the ProducTVity Station.

COLLATERAL

BROCHURE – ADLD0120

Our current brochure is part number ADLD0120, and may be ordered from the factory. It may also be viewed on the web at www.redlion.net/brochures.

SOFTWARE

Crimson is available as a free download from…

www.redlion.net/Support/Downloads/SoftwareLibrary/Crimson3.html

If you already have Crimson 3.0 installed, and your computer has access to the Internet, you can make sure you always have the latest released build by clicking Help – Check for Updates.

ATTRACTIVE DATABASE

Make sure you load the ProducTVity Station with an attractive database. The one used to create the brochure can be found at www.redlion.net/ptv.

BULLETINS

The hardware bulletin on the ProducTVity Station is available at http://www.redlion.net/ptv.

SUPPORT

Our main support page is located at http://www.redlion.net/Support.html.

TECH NOTES

A growing list of Tech Notes is provided to assist with a variety of applications at…

http://www.redlion.net/Support/VirtualHelpDesk/TechNotes.html

TECH SUPPORT

The Interface & Control Team at Red Lion currently has four full time members, which may be reached Monday through Friday, 8:00 AM to 5:00 PM EST at…

717-767-6511, or via email support@redlion.net.

SELLING SCRIPT

DIAGNOSE FIRST!

As previously stated, you're selling productivity, not hardware. True practitioners of the value sale don't rely on hardware to get orders, and instead spend considerable time on diagnosing the customer's needs. You should start with the questions covered in the section "SELLING VALUE – DOLLARIZING THE BENEFITS".

PREPARE

After the diagnosis phase, you're going to need to show the customer just how easy it is to create a working solution. Make sure you take the time to collect the following for a successful sales call…

- ProducTVity Station

- 24 VDC supply

- DVI to HDMI cable

- HDMI to DVI adapter

- USB programming cable

- Crimson 3.0 installed on your PC

- Download the demo database to the unit[9]

- Monitor or TV – probably best to borrow the customer's PC monitor!

PRESENT

SHOW OFF THE DISPLAY (REALLY, IT'S OK)

If you've ever watched me conduct a presentation on the G3 series HMI, you'll remember how many times I suggested that you avoid discussing its display – the G3's differentiators were its built-in protocol converter, data logger, and web server, not its display. In contrast, one of the ProducTVity Station's *best* features is how it creates a display on any TV or monitor!

Load the demo database, and find a TV or PC monitor to use as the display. The demo database cycles through various screens that illustrate how the PTV can help the customer with the visual management component of his continuous improvement initiatives. The diagnosis phase described above will illuminate which screens will be most interesting to your customer, and therefore which ones you should focus on. Of course, some of the examples might spark a new idea, so you'll want to let the customer see them all. Below are just a few examples of what your customers can create…

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[9] Demo database available at www.redlion.net/ptv.

KPI – KEY PERFORMANCE INDICATORS

LINE	GOAL	PRODUCED	BAD	GOOD	SHORTFALL	PERCENT
1	1000	852	12	840	160	84 %
2	750	46	3	43	707	5 %
3	900	801	12	789	111	87 %
4	5000	4527	55	4472	528	89 %
5	1250	757	10	747	503	59 %
6	6500	5586	214	5372	503	82 %
7	5000	4489	76	4413	587	88 %
8	3500	75	2	73	3427	2 %

- Communicate critical KPIs to personnel to improve performance
- Reduce downtime by providing visibility
- Improve efficiency by reducing scrap

ANDON MESSAGING

Line 1 = Running
Line 2 = Jammed
Line 3 = Running
Line 4 = Need Material

- Communicate line down conditions to allow immediate response
- Status of raw materials prevents scrap rate of continuous processes

COMBINATION MESSAGING

Cell 1	Cell 2	Cell 3	Cell 4
852	46	801	4527
Need Parts	OK	OK	Complete

| Cell 5	Cell 6	Cell 7	Cell 8
757	5586	4489	75
OK	OK	Technician	OK

- Combined productivity information and andon messaging

CHANGEOVER MANAGEMENT

Current Run
Order #365 MIL-W-16878
2,321 of 5000 ft.
@ 151 FPM - 18 minutes remaining
**Next Order**
MIL-W-16878D PTFE Shielded

- Inform operators what product is being run to prevent costly mistakes
- Inform operators of next production run to prepare for machine changeover
- Make process information, i.e. speed, temperature, etc. visible from anywhere
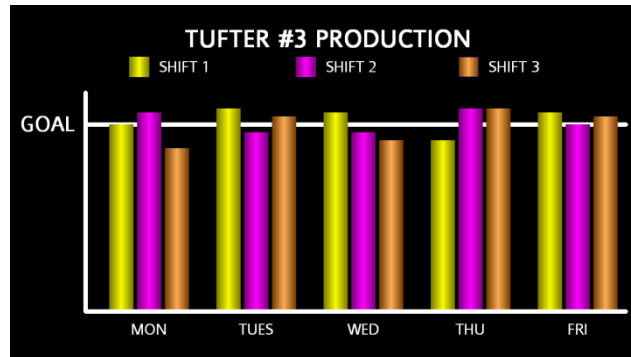
PROCESS STATUS
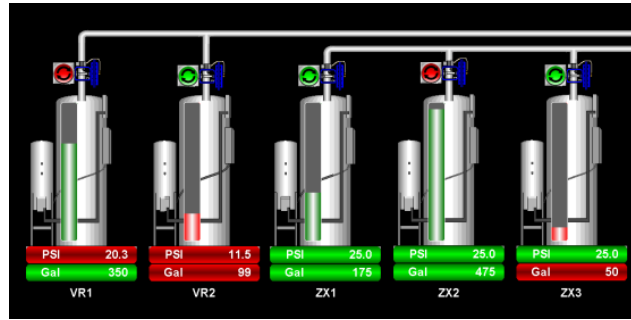
- Provide critical process information to the operator, regardless of location

- Provide information at a glance, freeing the operator for other tasks

LINE DOWN TIMER
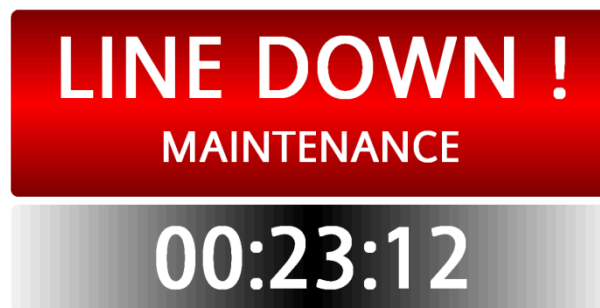
- Communicate reasons for line down conditions

- Display how long the line has been down thus far to motivate personnel to correct the problem

SHIFT COMPARISON

- Motivate employees to achieve their weekly goal

- Create competition between shifts

SOFTWARE DEMONSTRATION

Any manufacturer can walk in with a canned, preprogrammed product that produces great results. What differentiates our products from our competitors' is how quickly and easily our software allows virtually anyone to create stunning results.

Of course, *every* vendor describes their software as "*An intuitive, drag-and-drop, point-and-click programming platform.*"… I think I've used that exact line myself a few times! Therefore, you'll have to show your customer that Crimson really *is* superior. If you've attended the hands on workshops, you've already programmed a PTV. For a quick refresher, download the Crimson 3.0 Tutorial at…

www.redlion.net/Support/Downloads/SoftwareLibrary/Crimson3.html

GOOD LUCK, AND GOOD SELLING!