

AAM MAGAZINE

The Official Newsletter of American Auto-Matrix

2011 Volume I



DAWN OF THE NEXUS

A Word From The Editor

My Dear Reader,

I am sure it is with great excitement and vigor that you received this edition of AAMagazine. I hope that you were able to quell the wave of absolute joy and prevent yourself from ripping the magazine from its polyurethane bagging with your teeth. My dentist says it is bad to open things with your teeth. Furthermore you may swallow the plastic. I digress...

It is with great pleasure we send this edition of AAMagazine. We know it has been some time since the last edition. This actually is no fault of our own. Through a new Marketing analysis process we are calling "BS" (Brilliant and Succinct) analysis, we have been able to determine there is a direct correlation between our ability to create this magazine and television. I assure you we are working day and night to figure out how to stop streaming reruns of Mr. Ed into our office. Once this happens, we feel we should be able to get a handle on the timely delivery of this publication. Please just remember a horse is a horse of course, of course, but we are on a steady course.

In all seriousness, I hope you enjoy this publication. We are excited to share with you new products, pictures from the National Sales Meeting, our new hires, and the excitement our employees share for what we are developing and where they work.

Sincerely,



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SI Noteables

American Auto-Matrix wants to recognize the excellent work and creative ways our Solution Integrators present our products to the industry.

Allen Xu at Shenyang Controls (China) built this innovative showcase for trade shows and other demonstrations.

It is a great representation of the use of the AAM Marketing look and feel that shows the technological advancement we all work so hard to create and convey to the public.

Send pictures of your demonstrations, showcases or participation at trade shows to bpierce@aamatrix.com and include a brief description of the event. We'll be happy to publish it and show the world the creative ways you promote AAM products and services.



Advanced Users Forum

We are pleased to announce that the first AspectFT Advanced User Forum of the 2011 calendar year was a success! We are dedicated to providing you with the information you need to achieve your goals, and are hosting three more Advanced User Forums in 2011. Two of these forums will be web-based, while one will be held at the Hyatt Regency at the Pittsburgh International Airport. Jim Chabucos, Director of Engineering, will host each forum with other AAM employees in attendance. Topics will include project creation questions, best practices, and tips and tricks for creating smoother and more streamlined projects. We also want to hear about your own experiences, ideas, and projects.

Future webinars are planned as follows:

- July - Webinar
- September - Hyatt Regency on-site meeting
- November - Webinar



Information on the July and September events will be announced soon. November times and dates to be announced after the September event. To register, please email Brooke Pierce at bpierce@aamatrix.com with your name, contact information, and email address for the Webex Invitation. In order to be applicable for attendance, users must have passed AspectFT training. Slots will be filled on a first come, first serve basis as there is limited seating. You will be notified if the slots are filled, and by request, you will be listed in the queue for the next webinar.

Each session will give you information while we get input from our users for future implementations. Please come prepared to make a difference! Contact Brooke Pierce or your Corporate Representative at 724-733-2000 with any questions.

We look forward to seeing you there!

AAM 2011 Training Schedule

American Auto-Matrix Educational Services offers workshops designed to promote a sound understanding of controls methodology as well as detailed information on our products and services. This is a great opportunity to brush up on your knowledge base or expand it by attending one of our workshops. Classes are offered at the factory, online, or on-location. The on-location workshops can be customized to meet your requirements or the requirements of your customers.

Date	Class
July	11-15 BACnet Workshop
July	25-29 AspectFT Workshop
August	8-12 UC/SBC Workshop
August	22-26 BACnet Workshop
August	29-9/2 AspectFT Workshop
September	19-23 BACnet Workshop
September	26-30 AspectFT Workshop
Available Anytime Online Per Request	AAM Sales Training Auto-Pilot Workshop Factory BACnet Unitary Controller Workshop 10-Day Workshop



The legacy workshops are available per request at the factory or on-location. Please check the AAM website for more details. If you're interested in attending or sending a student to one of the American Auto-Matrix workshops, please send an email to insidesales@aamatrix.com or call at 724-733-0397.



The NB-GPC-FHC: Marching To The BTL Drumbeat

By Leeds Allen



It's been 23 years since AAM first started making digital controllers for laboratory fume hoods. During that time, AAM has led the field in accurately controlling laboratory hoods through our advanced Auto-Flow methodology and our numerous related patents. Several years ago, we expanded our fume hood line to include BACnet controllers. In the coming month, we will release our first BTL-listed version.

Over the years, the GPC family of controllers has matured into one of the most stable, responsive and powerful platforms on the market. Many of you are probably familiar with the transformation the NB-GPC underwent as it jumped from the 1.x version of firmware to the 2.x versions. The main push for that extensive upgrade was to apply for, and receive, a BTL (BACnet Testing Labs) listing for the product family - but the updates didn't stop there. Version 2.x of the GPC added BACnet schedules, BACnet alarming, and hundreds of new and more advanced objects and capabilities. The NB-GPC-FHC has at last surpassed its SBC brother's footsteps with this latest release of the controller.

Before proceeding, perhaps a quick refresher on fume hood controls is due. The general consensus for fume hoods is that air must move across the face of the hood at 100 feet per minute in order to ensure that airborne chemical and biological elements used in the hood don't contaminate the laboratory environment. In most applications, 100% of the air that moves through a fume hood has to be directed outside, meaning that every cubic foot of air through the hood needs to be replaced. As a result of this massive amount of conditioned makeup air, fume hoods can be extremely expensive to operate.

AAM's Auto-Flow method of control is still the most efficient means of controlling a fume hood. By using our patented airfoil pitot tube and an extremely low-range slack membrane pressure transducer, we are able to rapidly and directly measure the fume hood face velocity across the plane of the sash. The exhaust damper is modulated at twenty times per second to ensure that the proper amount of air is being exhausted on each hood. This high speed control coupled with direct airflow feedback allows us to save energy by ensuring that only 100 feet per minute worth of air is being exhausted at any given time.

As an example, picture two identical hoods in a laboratory, both with their sashes set at the same height and both set to exhaust 100 feet per minute. If a person is working in front of one hood and the other one is unused, they should not be exhausting the same CFM. The sash with the person standing in front has effectively reduced the open area of the hood because their own body has blocked off much of the face of the hood. This in turn increases the speed of the air moving through the remaining opening, causing a significant amount of waste. Because of the direct feedback integral to the Auto-Flow approach, the occupied hood would have closed its damper to reduce the exhaust flow to

maintain only the desired 100ft per minute.

Many fume hood specifications stipulate that there should be a calibrated Venturi-based damper instead of a standard damper. This older method of open-loop fume hood control was popularized by one of our competitors and is still found in many specifications. This method uses the calculated area of the sash opening to determine a target volume of airflow, and then setting the damper to a position that has been calibrated to achieve that particular flow. This sash-based method of control does not take dynamic changes to the system into account, but the perceived stability of this open loop control makes it desirable to many customers.

Luckily, the NB-FHC can be made to operate in seven different modes, including four different Auto-Flow and three different sash-position control modes. In fact, the most responsive control method that the FHC can employ uses a combination of the two methods. When in that mode, the airflow is still actively being measured, however large changes to the system (due to throwing the sash open or closed) are taken into account 50ms or so before the change in air flow is even detected! Even more efficiency can be easily achieved by reducing the flow requirements via occupancy sensors and integrated hood scheduling.

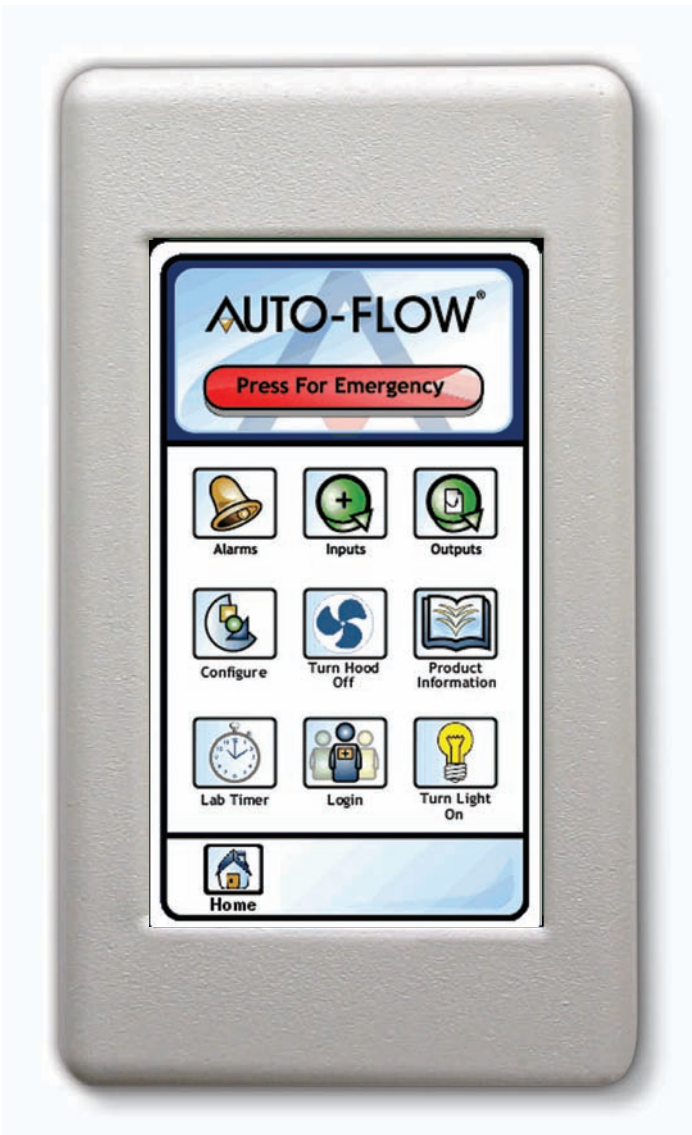
Of course, the biggest improvement with the newest version of the NB-FHC is the simplicity involved in commissioning the hoods. By answering a few questions about the hardware associated with the hood (what sensors are attached, what style of dampers are used, etc) the controller will automatically select the best method of control for the application. Once the data has been entered, the control methodology is formulated and the controller reboots into that mode.

One of the great advantages in this Q&A based approach to configuration is that once the controller has booted into the desired mode, only objects and properties that are appropriate for that mode are created. This allows the FHC to have 10 times fewer points than a standard GPC, something that greatly streamlines the commissioning process. In fact, I have defaulted, commissioned, tuned and calibrated an FHC in under 5 minutes - and that's without using any sort of capture file!

Version 2 of the fume hood controller also brings a lot of advanced BACnet goodies to the table. Intrinsic alarming was revamped and a fully certified BACnet calendar and schedule engine were added to increase the configuration options available to the installer.

Some of the other highlights of the FHC are:

- Any analog sensor technology can be used to measure face



- entry are all specific to the needs of the hood to which it is tethered.
- Among the configuration options modifiable via the display are:
 - Choosing the hardware compliment and associated control mode
 - Setting the alarm values
 - Configuring the piecewise curves
 - Modifying the BACnet network settings
 - Configuring the hood geometry measurements and the optional sash-monitoring string pot
 - Configuring the user passwords and the access level for each user
 - Tuning the control loops
 - Balancing/calibrating the hood
- An optional lighting relay can be controlled via the touch screen user interface.
- A stopwatch feature is easily accessible via the main menu on the display.
- When configured to allow the end user to turn the hood on and off via the display, the animated fan button will appear on the display providing intuitive feedback.
- A built-in SD card slot on the display allows for simple and reliable flashing of either or both devices without the need to use the MS/TP port or NB-Pro.

AAM has been using the Auto-Flow method of fume hood control for almost a quarter of a century. This latest product release, the BTL-listed NB-GPC-FHC, is not only the most advanced fume hood controller, it is also the simplest to commission and operate. Regardless of the customer's needs, this controller will get the job done quickly and efficiently, all while providing the end users with unprecedented flexibility wrapped up in an intuitive touch screen display.

velocity including hot wire anemometers, Auto-Flow sensors, differential pressure sensors in the exhaust duct combined with sash pots, etc.

- Intrinsic multi-stage alarming is automatically configured for both face velocity and exhaust flow.
- The control loop can operate in PID or fuzzy logic modes.
- Drop down boxes in NB-Pro allow piecewise curves to be automatically filled with English or metric variables based on the geometry of the sensor or output in question.
- Plug & play cascaded flow network allows for near instantaneous summation of the exhaust from all networked hoods.
- The internal schedule can be used to turn the hood on and off, set back the target velocity or simply control the hood lighting.

Some of the highlights of the FHC's integrated Touchscreen display include:

- The FHC-SD has over 150 different screens that the user can navigate through based on permission levels, the hardware compliment, and the configuration options chosen by the installer.
- Each of the screens is dynamic. The placement and number of buttons, the data displayed and the various limits for data



Keep Moving Forward

By **Ed Parham**

We're working very hard on a number of new product offerings that will undoubtedly increase your competitive advantage using American Auto-Matrix products... you can tell by the length of this article! One notable example of these efforts is the AspectFT-Nexus, which combines the best of both worlds into a single product.

Our efforts continue to advance our building controller arsenal through development and conception of our BACnet Building Controller (B-BC) project. Matured from solid NB-GPC v2.00 product technology, the B-BC offers a building controller platform true to the BACnet standard, but also compliments AspectFT. There are several key advantages to our upcoming B-BC solution, including but not limited to the following:

Dynamic Object Creation (and Deletion) – Nothing is easier than starting your control foundation from a blank slate, and B-BC incorporates this method. Rather than provide a slew of objects, B-BC allows you to create and delete the items you need through a standard network command. Whether you need more Data Storage Objects (such as AVs and BVs), Math objects, or even SPL programs, you're able to create them easily and effectively.

Glorious SPL – Did I say SPL? Yes, I did. This platform will provide you with plentiful SPL programming support. Using a solid, proven line-by-line programming language implemented in several of our products, users can add onto their building controller without interrupting the system or compilation and deployment. This feature alone will help many sites with Sage migration strategies.

Schedules, Trends, and Alarms – The holy trinity to any building automation system. Creatable and deletable like any other object supported by B-BC, the raw power of these features will provide you with flexible control and data collection like never before.

- o Schedules – provide fully implemented, rounded BACnet Schedule objects and calendars. Schedules provide your standard weekly-schedule and exception-schedules. Similar to the GPC, you can schedule any value within the B-BC. These schedules now support the ability to schedule any data point in the system, whether it is a data point local to B-BC, on a device residing on a local MS/TP network, or on a remote network! Of course, Calendar objects are supported to drive special events and exceptions.

- o Trends – provide fully implemented Trend Log objects. A Trend Log is a record of a single point from the system, and can be trended in a polled manner (based on time interval), triggered interval (based on event), or even through Change-of-Value.

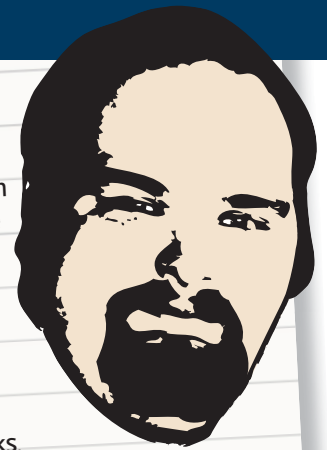
- o Alarms – a new philosophy introduced in NB-GPC v2.00 Technology has been carried over to the B-BC. The user will be able to alarm anything logically or physically using standard BACnet Alarm/Event services.

GPC Library Blocks – You loved them in the GPC v2.00 platform, so we're giving them to you in the B-BC. For those of you who have become accustomed to abandoning SPL and using all of the internal logic blocks within the GPC, you can create and construct your logic routines using the same blocks. They're all there: Control Loops, Data Manipulation, Logic, Math, etc.

Increased Data Communications – With all the things this device can do, we found it necessary to support advanced communication factors such as COV, Data Segmentation, and some newly adopted BACnet standard features. This will make the product move significantly faster relative to data communications.

The B-BC product introduces a paradigm shift to what once was simplified system architecture, and AAM Solution Integrators are the winners on this one. Be on the lookout in the coming months for more information regarding both AspectFT-Nexus and our B-BC offerings. The products are scheduled to enter Beta in late Spring, with an official release to follow later on this Summer.

"We keep moving forward, opening new doors, and doing new things, because we're curious and curiosity keeps leading us down new paths." - Walt Disney



Recent AAM Releases

NB-GPC Family - v2.02
SBC-GPC - v2.01
AspectFT - v1.05.02
SoloPro - v2.7.1
NB-Pro - v2.8.5
Integra - v3.5
Aspect Viewer - 1.0.0.3
API-Pro - v1.0.10
NB-ASC Family - v6.05
NB-SD - v1.03
SBC-SD - v1.04
SBC-ASC Family - v4.06



2010 Service Award Winners (left to right)

Kim O'Neill (15 Years)

Leeds Allen (5 Years)

Joanne Holloman (10 Years)

LuAnn Matiasic (5 Years)



Engineering Applications Guide



American Auto-Matrix wants to remind AAMagazine Readers of the electronic version of the Engineering Applications Guide (<http://architecture.aamatrix.com>). This informative guide was developed in addition to the printed version as a tool to help your customers conveniently research, find, and download information about AAM products and solutions. Using this electronic version, users have the ability to retrieve important documents like the AAM Guide Spec, review controller comparisons and access datasheets for specification and informational purposes. American Auto-Matrix is now more accessible and convenient to share electronically as a leave behind piece with your customers, engineers, or facility managers.

Also available to users:

- The Controller Comparison Matrices
- The ability to download, review, and print PICS statements or the AAM Applications Guide.
- The ability to view additional product detail, such as I/O counts, product features and hardware specifications.

Access to AAM info has never been easier! If you haven't already done so, visit and bookmark the website <http://architecture.aamatrix.com>.





NSM 2011 AWARDS

Award recipients named left to right. All Pictures with Martha Jordan, COO & Paul Jordan, CTO.



Jeff Brotherton, Brian Pasour, Jim Murray
Mechanical Systems & Services, Inc.
Diamond Award



Brian Schuhmacher
Automation Solutions Group
Platinum Award



Adam Bek
AE Smith Building Technology
A-Team Award



Mike Riggins
Air Systems Engineering, Inc.
A-Team Award



Bob Boscia
ASM Electric
A-Team Award



Dean Koenig
Autocon, Inc. / Denver
A-Team Award and Most Improved West



Marc Vadboncoeur
Auto-Matrix Contrôles
A-Team Award



Rick Suarez and Steve Brown
B.A.S.S.
A-Team Award



Seth Hemley
Brandon Associates
A-Team Award and Exceptional
Contribution Award



Craig Neulieb
Control System Specialists LC
A-Team Award



Tom Addabbo and Greg Koetz
Egan Automation
A-Team Award



Pete Beisel
Encon Services & Supply Inc.
A-Team Award

NSM 2011 AWARDS (cont.)



John Godwin
Envirocon
A-Team Award



Sid Ellis
Enviromatic Systems
A-Team Award



Graham Turner
GB Auto-Matrix Limited
A-Team Award & Most Improved International



Paul Milano
Huntington Controls
A-Team Award



Steve Gavlak
Pittsburgh Auto-Matrix
A-Team Award



Doug Swain
Pueblo Mechanical and Controls, Inc.
Most Improved Southwest & Bounceback
Award



Troy Winjum, Jason Fletcher, Adam Augedahl
Winona Controls
A-Team Award

Additional Award Winners (not pictured):

- CNA Integrated Technologies LLC - Platinum Award
- Capitol Mechanical, Inc. - A-Team Award
- Energy Automation Technologies - A-Team Award
- J & H Controls - A-Team Award & Most Improved Midwest
- Kele, Inc. - Award for Improved Sales

Rocket A Awards *for Effort Beyond All Expectations*



Kim O'Neill



Jim Chabucos



Sandy Dick

NSM 2011 Presentations are available for download on the AAM Toolbox.

Dawn Of The Nexus

By **Will Kay**

Spring has finally sprung in Pennsylvania. Along with warmer weather and longer days, new life is sprouting up all around us. In the coming months, American Auto-Matrix will see an idea spring to life as well, with the introduction of a new hardware platform. This new platform, dubbed AspectFT-Nexus, is an amalgamation of the existing AspectFT-Matrix and AspectFT-Facility hardware, and inherits the best features of each while providing a few new tricks of its own. Those of you who attended the 2011 AAM National Sales Meeting in Las Vegas were introduced to the product, and were even able to bask in some prototype-y goodness first-hand.

The primary noticeable difference with the AspectFT-Nexus hardware is the deviation from our traditional enclosure design. Gone is the typical box style you've come to know and love from the current AspectFT products. In its place you'll find a stylish black anodized aluminum extrusion, designed from the ground up to be functional yet attractive. This enclosure intentionally bears a striking similarity to a large heat sync, as the aluminum cover will serve in heat dissipation duties for the internal circuitry. The backbone of the enclosure, where the electronics are mounted, consists of a galvanized sheet metal base clad in a black powder coating. Great care has been taken to ensure that this enclosure is both secure yet easily accessible for servicing of the internal components. Please note that while the enclosure has a stealthy, midnight black appearance, there are currently no plans for a ninja application.

Under the hood you'll find all the power of a AspectFT-Facility combined with the communication ports of a AspectFT-Matrix. The same 64 GB solid-state drive returns for project and database storage, however, the RAM has been doubled to 2 GB, allowing for larger and more complex applications.



A feature new to the AspectFT-Nexus are 3 serial ports which will be factory configured in your choice of either RS485 or STATbus. A tamper detection switch has also been added to detect infiltration by unwanted parties into the system. Previously both an AspectFT-Facility and AspectFT-Matrix would be required for mid-sized jobs; a single AspectFT-Nexus can now do it all.

While an AspectFT variant will be one of the product offerings to use this hardware, we're investigating other applications outside of the Aspect line for the AspectFT-Nexus platform. Stay tuned in the coming months for additional opportunities to take advantage of this hardware powerhouse.

**AMERICAN
AUTO-MATRIX®**
SMART BUILDING SOLUTIONS®
EMPLOYEE HANDBOOK



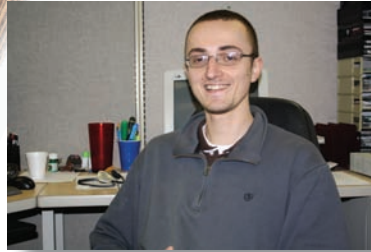
**Phil Westlake
Procurement Specialist**

Phil's prior work experience in the Manufacturing Industry included Production Planning, Inventory Control, a strong MRP background, and Program Management. This made him an ideal candidate for our purchasing position which requires industry know-how in order to procure materials from suppliers with consideration of quality and reliability. Phil has a Bachelor of Arts Degree in Geography.



**Dan Dudkin
IT/Business System Specialist**

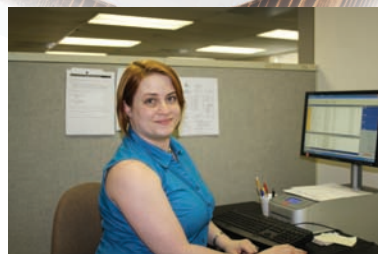
It is a pleasure to welcome aboard our new IT/Business System Specialist, Dan Dudkin. His extensive background and knowledge in IT Support, Network Administration, and Web-based Design, is just what we were looking for in a resource who will be providing our organization with ERP/MRP System support, enhancements, and upgrades – among many other IT support needs. Dan has an Associate of Computer Network Systems Degree and is also a Cisco Certified Network Associate, and a Microsoft Certified IT Professional.



enhancements, and upgrades – among many other IT support needs. Dan has an Associate of Computer Network Systems Degree and is also a Cisco Certified Network Associate, and a Microsoft Certified IT Professional.

**Brooke Pierce
Marketing Assistant**

What we needed was someone who could assist our marketing efforts, coordinate meetings and trade shows, and communicate information effectively to our SI's –



and along came Brooke. She picked up the ball and ran with the organization of our very successful NSM. She is proficient in website design, video editing, and has exceptional writing and communication skills. Brooke is a dynamic personality with a Bachelors Degree in Management-Marketing, Associate of Science Degree in Photography, and an Associate of Science Degree in Multimedia Production.

**Cale Botti
Account Representative**

Cale is beginning his sales career by assisting with our business development efforts, forecasting sales, and building relationships with our SI's, and future prospects, which is an important focus to us. He is a motivated individual with some prior experience in account management, sales plans and strategies, and the vision to identify new opportunities. As a member of Rocky's Team, Cale will be visiting some key accounts soon. He is a recent graduate from the University of Pittsburgh with a Bachelor's Degree in Business Management.



New Faces At Pittsburgh Auto-Matrix

**Dan Powell
Pittsburgh Auto-Matrix
ATC Technician**

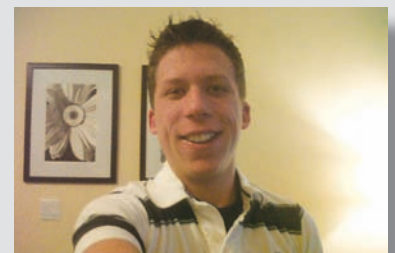


Having just completed his Associates Degree in Specialized Technology – HVAC/R and with four years experience as an Electrician, Dan comes to us with a

strong mechanical aptitude. This new position requires field diagnostics, building HVAC monitoring, and service to system failures in order to provide customer satisfaction.

**Ryan Franciscus
Applications Programmer
Pittsburgh Auto-Matrix**

Ryan is responsible for the design, documentation, and programming of new and active projects. He designs the front end graphics as well as ensures that the software operates as originally designed. Ryan has an Associate in Science Degree, Information Technology and several years experience as a Programmer with our controls.



What's Your ASPECT?

With the AspectFT HVAC Energy Control Family your building can harness the power of the internet to not only perform control of your building, but store and access data as well. Through most standard web browsers, you can access web pages and databases created especially for your building, monitor and manipulate a variety of energy consuming resources, and mine data, thereby giving you the ability to see where energy is being consumed and reduce it. With features such as RSS feed integration, simple mobile web access, email messaging, and the ability to tweet, AspectFT can update you on vital building information key to saving energy and money even when you are on the go. If your building cannot give you information virtually whenever and wherever you need it, are you really in control?



High School Campus:

The Facilities Manager just scheduled a snowday for the entire campus from his home using Google™ Calendar (one of over 45 programs that use the iCalendar format), saving energy, time, and money.

Restaurant Chain:

Corporate wants to know HVAC energy trends worldwide. They just accessed the records on the corporate server in Houston from their office in Chicago utilizing their SQL infrastructure.

www.whatsyouraspect.com

