GM’s EE Boss, Micky Bly

Tools and Energy Efficient Components Needed

In October 2009, Micky Bly became the authority for most things electrical at General Motors when he picked up responsibility for two engineering organizations that were merged and part of a third. Now executive director of global electrical systems, hybrids, electric vehicles and batteries, with 1,600 people reporting to him, Mr. Bly runs what was Hans-Georg Frischkorn’s electrical organization. He also leads the hybrid battery and hybrid vehicle integration activity that until last year reported to Bob Kruse. Those two organizations were combined during G M’s major post-bankruptcy reorganization. Mr. Bly also has responsibility for the advanced development of electrical systems operation formerly led by Matt Tsien. His responsibilities do not include powertrain electronics and controls.

Mr. Bly will be working closely with Larry Nitz on vehicle electrification. Mr. Nitz handles power electronics and traction motor development, while Mr. Bly is developing everything else involved with electrification, the biggest remaining piece being the batteries.

Mr. Bly will also be working closely with OnStar president Chris Preuss on expanding the OnStar brand into information. “I have all of the execution responsibility for infotainment systems and Chris has responsibility for the brand,” he said. “OnStar has clearly been the industry leader in safety and security. We think GM can continue to lead by expanding that safety and security umbrella around infotainment as we bring in state-of-the-art [connectivity] interfaces. We are very concerned with some of the solutions coming into play that aren’t taking a holistic approach,” he noted.

Nokia Makes Headway with Terminal Mode Car Interface

Potential Smartphone Connection Standard

Nokia’s Terminal Mode software specification for integrating smartphone applications into the vehicle’s HMI will come to market in a European production vehicle probably in the first quarter of 2012.

Nokia, which is getting help with the Terminal Mode specification from the Consumer Electronics for Automotive (CE4A) consortium of German carmakers, says it will make Terminal Mode part of its Symbian and MeeGo (Intel/Nokia) operating systems by the end of the first half of 2010. CE4A’s five members include Daimler, Volkswagen, Audi, BMW and Porsche. Daimler and Volkswagen have been the most active carmakers in the consortium with Terminal Mode. Volkswagen chairs the Terminal Mode working group.

According to Peter Ebel, Daimler’s senior manager for system functions and features, infotainment and telematics, engineers became interested in Terminal Mode as a way to retrofit Mercedes’ infotainment systems for regional markets. They first learned of the Nokia software when it was used to link Nokia phones to a computer and then to a video projector for phone demonstrations. That led to discussions with Nokia, which further developed the software and then asked CE4A members to support Terminal Mode standardization.

With the release of the spec in May 2010, Daimler has begun designing systems based on Terminal Mode but says it will take at least two years to bring these systems to market.

Nokia is getting cooperation from outside the CE4A as well. It has been working with Fiat and Magneti Marelli, who had a Terminal Mode demonstration at the Frankfurt Motor Show last September.

Nokia has also been working closely with Harman, Alpine and Continental, whose infotainment systems would accommodate Terminal Mode software.

Smartphone Terminal in the Car

Terminal Mode turns the vehicle into a smartphone terminal: smartphone applications can be viewed on the vehicle’s display, heard on the audio system and controlled by means of the vehicle’s HMI. With Terminal Mode carmakers could also make some vehicle data, such as speed or fuel level, available to navigation service providers, who could inform the vehicle when it is approaching a curve too quickly or suggest where to stop for gas.

Terminal Mode accommodates both a wireless Bluetooth connection between the car and the smartphone and a wired USB connection, the latter being useful for recharging the smartphone.

According to Vesa Luiro, whose staff has been putting the finishing touches on the specification at a Nokia Laboratory in Berlin, Terminal Mode comprises roughly a megabyte of software code for the smartphone and an equal amount of software for the vehicle’s infotainment system. “It takes about one man month to integrate Terminal Mode into a current Linux infotainment system, so it doesn’t require much effort,” noted Mr. Luiro, who is automotive director at Nokia and project lead on Terminal Mode.

The Terminal Mode reference platform first draft is available for download at www.ce4a.org or from www.nokia.com/terminalmode.

Driver Distraction

Not many carmakers will want to make anything that is displayed on the smartphone available to the vehicle’s driver display. “For example, you can have

Turn to Terminal Mode, page 3
When it comes to relationships with suppliers of electrical and electronics parts, Mr. Bly will be working closely with Kim Brycz, executive director of purchasing for electrical systems and batteries.

"Engineering and purchasing are now aligned as they never have been before. Kim and I are working together on strategies, supplier relationships and sourcing proposals. Suppliers will no longer have to go to three or four different organizations at GM; they can come to just one meeting with me or my directors and Kim or her directors."

**Simulation Tools Needed**

I asked Mr. Bly for examples of the sorts of investments suppliers should be making to further their chances of doing business with GM in the future.

His first example came immediately to mind: "Very early in the development process we and our suppliers need to move further into the virtual world with much more emphasis on analytical tools—not just the tools to create algorithms and software, but also the tools that allow us to optimize our entire electrical system. By that I mean reducing the number of electronic control units, reducing the software effort, reducing the vehicle wiring, reducing complexity. ... I want to be able to use simulation to run thousands and thousands of iterations before we build our first physical hardware."

"To be as efficient as possible all the tools—hardware, software, communications networks—must be integrated and they must be seamless. I want to be able to pick up my MatLab Simulink model, move it instantly out to another system development activity. I want to share that model with a full-size truck or small car development program and with Korean, Indian or German development teams."

General Motors has been benchmarking open source tool development efforts underway in the aerospace industry.

"Some of those tools allow you to go from requirements to analysis to design very quickly and very robustly. We have picked a few key suppliers that we are working with to understand that technology and recently flew out west for discussions with some of the aerospace guys. We see huge benefits. They work almost entirely in the virtual world. They never fly a plane until it is perfect."

**Energy Efficient Components**

One of the most expensive components in an electric or hybrid vehicle is the battery pack. "They are heavy, they are very expensive, and in the Chevy Volt they are liquid cooled. So it is especially critical that our suppliers develop components and systems that place smaller energy demands on the battery so it can be as small as possible," said Mr. Bly. "One obvious place to look for efficiencies is in the HVAC system. In conventional vehicles it takes about as much energy to push a car down the road as it does to keep the occupants cool, so we need to be creative and figure out how to do things differently. For example, a temperature controlled seat that keeps its occupant comfortable is much more efficient than maintaining a set temperature throughout the entire cabin."

**Suppliers**

Having suffered through the economic downturn and bankruptcy, GM and its suppliers have been weakened, so I wondered if Mr. Bly felt hampered now by a shortage of local U.S. suppliers. "We have outstanding U.S.-based suppliers today. They are the ones that made it through the economic turmoil of the last couple of years. Those with high structural costs or those who didn’t have well-engineered solutions are not with us any more, and that’s okay," he replied.

Four U.S.-based suppliers of electrical or electronics parts won Supplier of the Year awards from GM in 2009: Bose, Gentex, Johnson Controls and Lear. One of GM’s key suppliers is Denso, a company that is 24.5% owned, and some would say controlled, by Toyota. Yet Mr. Bly doesn’t see Toyota’s relationship with Denso as a competitive disadvantage: "I don’t consider Denso wrapped up by Toyota by any means. Denso is an outstanding global supplier. They’ve proven themselves not only with their technology and capability, but with their quality performance. I have Denso on a lot of cars in a lot of areas I am responsible for. I enjoy working with them. They’re always coming in with new technologies, new ideas."

Denso, too, recently received a Supplier of the Year award from General Motors for 2009, its seventeenth, as did another Toyota supplier, Fujitsu Ten. One of GM’s four electric and hybrid vehicle battery suppliers is Primearth EV Energy (formerly Panasonic EV Energy), owned 80.5% by Toyota.

"In the infotainment domain, we have been working with some nontraditional suppliers, companies like Apple, Google, Microsoft and RI, because they know how to go fast," said Mr. Bly. "We are balancing their speed with our knowledge of vehicle engineering requirements."

**Electrification and Infotainment**

Mr. Bly is responsible for delivering two important pieces of technology that GM hopes will turn lots of consumers into customers: electrification and infotainment. "I’ll know I have done a good job when people are standing outside the dealership begging to get one of our vehicles because it’s exactly what they want. I think the Volt is going to do that. And I think some of the smartphone apps we will be rolling out and these infotainment and safety and security features we have been working on will do that."

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**THE HANSEN REPORT ON AUTOMOTIVE ELECTRONICS**

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Terminal Mode...

20 icons on an iPhone. Having 20 icons on an eight-inch touch screen is something that would violate our driver distraction guidelines," pointed out Doug VanDagens, Ford's director of connected services.

Nokia has been working on some tools that will help OEMs filter what smartphone data gets streamed to the vehicle's display when the vehicle is moving. "Carmakers may also want to create an abstraction layer on top of the user interface so instead of seeing exactly what's on the smartphone they can blend the smartphone data into the head unit's graphic design," said Mr. Luirio.

No Commitments from Apple or Google

Daimler has been talking with Apple, third in worldwide smartphone market share behind Nokia and Research in Motion (RIM), about integrating their devices with the vehicle and whether Apple might be willing to support Terminal Mode. Thus far, Apple has not said if it would go along with Terminal Mode.

"With Apple you usually need a special A pple solution, so we would have to support two mobile device standards, Terminal Mode and Apple's iPod Out protocol," said Mr. Ebel. "We and our competitors [in C E4A] have been discussing whether or not we can do this."

Carmakers have a problem with Apple's approach, which produces an analog video output making it difficult to determine what the video is and whether or not it will be distracting. A such, the iPhone's video would have to be switched off from the vehicle's display when the car is moving.

CE4A engineers have also had some discussions with Google, who so far has been receptive but noncommittal. Wieland Holfelder, Google engineering director responsible for the company's automotive engagements, wrote in an email that Terminal Mode is "interesting and promising and Google is happy to take a close look at it." Google's Android operating system is forecasted by Canalys to win nearly a 20% share of the North American smartphone market in 2010. At the end of the first quarter, Android had a 9.6% share of the worldwide market according to Gartner, making it the fourth largest smartphone OS, bumping Microsoft Windows Mobile down to number five. Between Q1 2009 and Q1 2010, Nokia's global market share fell 4.5 percentage points to 44.3%.

Ford's AppLink Solution

Well ahead of any vehicle introduction of Terminal Mode, owners of the 2011 Ford Fiesta will be able to download Sync A pplink in the fourth quarter of 2010. "AppLink allows us to take the controls in the vehicle—the voice engine, speakers, switches, microphones—and data from the car, and share that with [certain] smartphone applications," explained Julius M archwicki, Ford product manager for A pplink. A pplink works with different smartphone operating systems including Android, BlackBerry and Apple; it will become a standard Sync feature starting with the 2012 model year.

AppLink will initially work with just three smartphone applications: Pandora Internet radio, Stitcher "smart radio" and Orangatame's OpenBeak, used on BlackBerry devices for posting updates to Twitter, but many more will be announced in the coming months.

AppLink will provide only limited access to video displays, because most Ford vehicles have only very simple, two-line vacuum fluorescent displays. But M r. Van Dagens said he is willing to consider enhancing A pplink A Pls, "so what you see on these smartphones would be available to our vehicles. If we are the ones setting the [safety] standard for those graphics, we would be willing to provide that solution to the industry. We could use Terminal Mode to push graphics from the phone to the vehicle." Ford would also like to see more smartphone makers than just Nokia adopting Terminal Mode. "We adopt standards as the industry creates them, when they get traction, things the device manufacturers come together and agree on and implement," added M r. M archwicki.

A s more of the world's vehicles are produced with displays, interest in Terminal Mode's video capabilities will grow. Nokia will be hosting a Terminal Mode summit on June 23 at Nokia headquarters in Espoo, Finland. For more information, see www.nokia.com/tmsummit.

Auto Electronics Update: India

A fter China, India is the world's fastest growing automotive electronics market. According to C SM Worldwide, vehicle production in India is expected to quickly grow, from 2.4 million vehicles in 2009 to 5.0 million vehicles in 2016; that's 10.9% growth per year. The penetration of electronics will also increase significantly from where it is in India today: between 5% and 10% of the vehicle's cost. In vehicles produced for Japanese, South Korean, West European and North American markets, electronics content accounts for 25% to 30% of the vehicle's value, roughly.

We spoke recently about the Indian automotive electronics industry with VG Gujarathi, who retired last year from T ata M otors where he was in charge of electronics development. "Today most design and manufacturing of low-level electrical and electronics products is done in India. The market is extremely cost sensitive, so those parts have to be produced at Indian costs, whereas high-level electronics like powertrain EC Us have come to India from European, Japanese or Korean suppliers. A s car production volumes have picked up, these suppliers have very slowly increased their presence in India. They started with assembly operations, then some of them set up manufacturing facilities, and lately some have set up engineering operations here.

"Still, there are many opportunities for additional suppliers in India," said Mr. Gujarathi, "especially in high tech areas where there is an absence of real competition. For example, there are many A BS suppliers in the world but here people are tied up only with B osch and Bosch is taking their pound of flesh."

"A second opportunity is airbags; there are only one or two suppliers here. T hird is lighting. T here are many low-tech lighting suppliers of headlights, tail lights..."
The Company Profile...

Preh Group

# Background

The earliest incarnation of Preh was in 1919, but the company did not enter the automotive market until 1988, initially serving BMW and Volkswagen. At various times during those first 69 years, Preh was in the business of making radio and TV components, toys, keyboards and industrial electronics. Its first automotive products were climate controls and sensors, which remain its two largest product groups today. In 2008, Preh sold PrehTronics, its electronics manufacturing services business, to concentrate on automotive, an industry that accounted for 96.5% of total sales in 2009.

With the global vehicle production cuts in 2009, Preh’s sales declined 13% from the prior year. However, even with vehicle production down 32% in the NAFTA countries, Preh’s sales in the region actually grew by 25% due to new business wins at Ford and General Motors.

Preh’s current owners, Deutsche Beteiligungs AG (DBAG) and the management team, acquired the company in 2003 from Rheinmetall AG. DBAG is a Frankfurt-based private equity company, publicly traded on the Frankfurt Stock Exchange. DBAG’s website states that when making investments, “What we look for are a skilled management team, a strong market position, a positive earnings position and the potential to build additional value.”

During the business downturn in 2009, Deutsche Beteiligungs provided 7.25 million euros in extra capital to Preh, but the additional funding didn’t affect DBAG’s ownership percentage.

While most of Preh’s business is with premium carmakers BMW and Audi, the company prides itself on being able to also serve the lower end of the market with products for vehicles such as the Opel Corsa or the Volkswagen Polo. “If you only serve premium carmakers, the typical OEM purchasing officer wrongly thinks that you are an expensive company. We aren’t,” said Michael Roesnick, president and CEO of Preh.

Preh has a very diverse product line for a company its size, much of it built around various driver controls: assemblies of multipurpose buttons, sliders, rockers and di- als used to control infotainment or climate control systems. Preh designs and manufactures complete assemblies in house including electromechanical and plastic parts and electronics.

Product strategy is largely determined by what the top customers want. Business development efforts are focused almost entirely on its five largest customers, BMW, Volkswagen, GM, Ford and John Deere. It is not reaching out to do business with Asian carmakers. “That is by choice,” said Dr. Roesnick. “Today our R&D organization is already fully com-
Preh also makes ruggedized instruments and clusters for the agricultural equipment makers John Deere, Same Deutz, and Claas, and for some motorcycle makers but not for passenger vehicles.

Competitive Distinctions

We asked Dr. Roesnick why carmakers choose to do business with Preh rather than its competitors such as Continental, Denso or Valeo, which are much larger. He cited three main reasons: “First, we develop our own technology in house. Second, we are customer oriented so we are faster and more responsive than our competition. That is especially important with our interiors products. When a CEO inspects a newly developed vehicle, the first thing he is going to do is go in and play with the knobs, so there are often changes late in the process. We are fast enough to handle that. Third, our prices are competitive.”

Preh’s in-house core competencies include plastics engineering and surface finishing technology as well as electronics and software expertise. The company’s software development capability is at SPICE level 3 in some areas and SPICE level 2 in others and that may suffice for now. “Some years ago the auto industry was asking everyone to get up to SPICE level 4 but that is expensive and impractical,” said Dr. Roesnick. “The industry is now saying that level 3 and level 2 is good enough.”

Promising New Products

◆ Black Panel Technology

Among its recently introduced new products, the company sees its black panel technology, first introduced at the Frankfurt Motor Show in 2007 in an impressive integrated center console concept, as most promising in terms of future sales. In the best example of what Preh calls “intelligent mechatronics,” the control surfaces of the panels look entirely black until the ignition is turned on and the backlit icon on each switch comes to life.

“Unless you switch on the ignition you will see none of the control surfaces; instead you see a homogenous black surface,” explained Ronald Schaare, in charge of Preh’s marketing. The backlit icon is achieved by means of painting and laser etching from the back. A scratch-resistant foil is used for the front surface of the switch.

Used in production in the center-stack-mounted audio/HVAC control panel on the BMW 7 and 5 series, Preh’s black panel technology will account for roughly 15% of Preh’s 2010 sales, a percentage that could jump to as high as 30% of sales in three or four years.

Porsche featured Preh’s black panel technology in the center stack of its Spyder concept vehicle at the 2010 Geneva Motor Show in M arch.

◆ Multifunction Steering Wheel Switch with LTC Technology

A another promising new product, but one that Preh hasn’t yet received a customer order for, is an LTC multifunction steering wheel switch that more than doubles the number of functions each switch can control. LTC is short for lenticular, meaning that the switch makes use of lenses (optics) that project an icon onto the button’s underside, which can be seen by the driver. The particular icon that is displayed on the button depends on which LED is illuminated. There is one LED for each function controlled by the switch.

Each switch is controlled by a microcontroller and connected to the vehicle by means of a LIN bus. The switch, including optics and the electronics, fits into a package that is no larger than the multifunction steering wheel switches that Preh presently ships to Volkswagen and Mercedes, about 15 mm (0.6 inches) in thickness.
Cabin Temperature Sensing
Without a Fan

Preh’s number-one product line in terms of sales is temperature control panels, which monitor and control cabin temperature. Preh has developed a way to sense cabin temperature that precludes the need for a fan to gather cabin air for measurement. Fan-based sensors take up more space, accumulate dust on the air inlet surface and occasionally need to be replaced.

Preh’s new sensor uses an indirect approach that requires at least two NTC (negative temperature coefficient) thermistors, one positioned behind a varnished surface on the climate control panel and the other elsewhere in the cabin. Those measurements are applied to an algorithm that takes account of outside air temperature, if the windows are open and other factors to indirectly and accurately determine cabin temperature. The location of the NTC thermistors may vary depending on vehicle type, and the size and configuration of the cabin.

Preh says its new sensor is less expensive than what it replaces. Thus far, Preh has received one production order from a German carmaker for its fanless cabin temperature sensor, which will be sold separately from the HVAC control head.

Major New Business Wins

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<thead>
<tr>
<th>Year</th>
<th>Product</th>
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<tbody>
<tr>
<td>2008</td>
<td>BMW 7 series</td>
</tr>
<tr>
<td></td>
<td>Ford F-150</td>
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<tr>
<td></td>
<td>VW Rabbit, Passat</td>
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<tr>
<td>2009</td>
<td>Bentley Mulsanne</td>
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<td></td>
<td>BMW 5 series GT</td>
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<td></td>
<td>Chevrolet Equinox</td>
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<td>Lincoln MKT</td>
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<td>Ford Mustang, Taurus, Flex</td>
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<td>Lincoln MKZ</td>
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<td>Opel Astra, Meriva, Zafira</td>
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<tr>
<td></td>
<td>Rolls-Royce Ghost</td>
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<td>2010</td>
<td>Audi A1</td>
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<td>Audi A8</td>
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<td>Bentley Mulsanne</td>
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<td>BMW 5 series GT</td>
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<td>Rolls-Royce Ghost</td>
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<tr>
<td></td>
<td>Ford F-250/350</td>
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<td></td>
<td>Ford Coyote V-8 engine</td>
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Preh’s Competitors by Product

<table>
<thead>
<tr>
<th>Category</th>
<th>Competitors</th>
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<tbody>
<tr>
<td>Climate Control Systems</td>
<td>Alps, BHTC, Continental, Delphi, Denso, TRW, Valeo</td>
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<td>Central Control Systems</td>
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<td>Alps, Continental, Flextronics, JCI, Methode, Panasonic, Sanyo, Valeo</td>
</tr>
<tr>
<td>Steering-Wheel and Other Switches</td>
<td>Alps, Delphi, Kostal, Marquardt, Methode, Tokai Rika, Valeo</td>
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Sensors

Sensors, mainly position sensors based on potentiometric and Hall technologies, accounted for 11.5% of Preh’s sales in 2009. In the past five years, it has shipped some 25 million position sensors, mostly for electronic throttle control applications. Potentiometric sensors for throttle valve control were one of Preh’s first automotive offerings; it had been providing the technology to other industries prior to 1988. Preh’s thick film technology is based on a glass coal design, producing a very hard, wear-resistant surface that gives its sensors a long life—100 million cycles or more, far exceeding the auto industry’s standard requirement of 30 million to 60 million cycles.

Preh’s potentiometric sensors are used, for example, by General Motors to sense throttle position and by Mercedes to detect brake lining wear.

Preh makes a line of capacitive sensors that detect moisture and humidity levels on the windshield to activate automatic wiper systems, and/or the HVAC system to prevent the window from fogging. It also offers an optical sensor for automatic headlight activation functions. Individual sensor modules can be combined in a single cluster to meet the customer’s preferences, for example, rain and defogging; rain and headlights; or rain, headlights and defogging. Optical sensors can also be used to control the brightness of a head-up display to a level appropriate to the ambient lighting conditions.
Climate Control Heads

With broad responsibility for passenger comfort in the vehicle, Preh makes complete HVAC control heads, including the software and ECUs, and also tests the vehicles under all weather conditions. “Our engineers work very closely with the OEMs,” said M. R. Schaare. Preh does not make compressors, evaporators, and heater cores that go in the engine compartment and therefore does not compete directly with traditional HVAC suppliers like Valeo or Denso, but rather with electrical suppliers like Continental, BHC (Behr-Hella Thermo Control) and TRW.

According to Dr. Roesnick, carmakers today, especially the Germans and North Americans, frequently source the climate controls from an electronics specialist and the HVAC system itself from traditional HVAC suppliers. “In former times, they were sourced together because you had a mechanical connection between the HVAC unit and the control unit. Today you have an electronic interface so that makes no sense. The HVAC is designed as part of the engine area and the climate control head goes with the interior design,” he noted. The control head is typically connected via the CAN bus, but the interface could also be via LIN or even a proprietary solution.

Preh offers fully integrated climate control systems, consisting of the control surface, electronics hardware and software, but it also can supply the components separately. As carmakers adopt more global platforms, a common, standardized climate control ECU offers some advantages. The electronics can be customized to suit a broad range of car models with varying degrees of complexity in their climate control systems. The same ECU could be used in an entry level model that may have a simple single-zone system, or a four-zone fully automatic system suitable for a luxury vehicle. According to Preh, carmakers can flash the appropriate software for each system when the vehicle is in production.

While Preh first got into the ECU business making ECUs for its climate control heads, it has expanded into different applications and has set up a separate ECU Product Group, which contributed nearly 6% of sales in 2009. Preh supplies ECUs for BMW’s integral active steering system and for a fuel pump application.

Multifunction Center Console Controls (MMI and iDrive)

After its first iDrive multifunction controller received a less than enthusiastic reception from customers when it was first introduced in 2001, BMW simplified the functionality in the second generation, but consumers still found the device complicated and annoying to use. In 2008 Preh was awarded part of BMW’s iDrive business, beginning with the 7 series, the 5 series GT and later the new 5 series.

In 2004 Audi introduced its Multimedia Interface (MMI) controller and customers found it a simple, convenient and intuitive means to control audio, navigation and phone functions. Preh developed and manufactured the control system for the MMI in most of the MMI-equipped Audi models: the A4, A5, A6 RS, Q5, Q7 and A8. The A8’s MMI can include an optional touch pad for selecting preset radio stations or entering navigation destinations letter by letter.

Part of the appeal of the MMI is its haptic and audio feedback—precise
tents and solid, mechanical-sounding clicks. “We want to appeal to all the driver’s senses because his task is to concentrate on driving, not on controlling knobs. We provide for sight, hearing and tactile feedback so driving and operating the controls is easy,” said M. R. Schaare.

Preh uses haptics technology based on a combination of magnetics controlled with electronics. Designers can vary the feel of rotary knobs, for example introducing half stops as well as full stops, to suit the application or customer preference.

Software Development Tools Used by Preh

DOORS for requirements management
MATLAB/Simulink/Stateflow, ASCET and Eclipse as integrated development environment
QA-C and Misra static code analysis, dynamic tests with Tesys
Surround SCM for configuration management
Test TrackPro for change and error management
CANoe and LINspector or EmulLIN for bus simulation
CANape and DIadem for measurement and application
Cross compilers, emulators and debuggers

The Company Profile Continued
Roundup: Mobis, Hitachi, Pioneer

Hyundai Mobis

Preliminary Results
2009 Sales: KRW 10,633 billion ($8.52 billion)
Change from 2008: up 13.4%
Sales in the module and Parts Manufacturing division, which provides roughly two-thirds of total sales, grew 16.5%; sales in the Service Parts division were up 7.5%.
2009 Net Margin: 15.2% compared with 11.6% in 2008
Outlook for 2011: In July 2009 Mobis announced that it aims to increase sales to KRW 22 trillion ($17.6 billion) by 2015 and become one of the top five global automotive parts suppliers by 2020, which would mean achieving annual growth of approximately 13%.

According to Mobis, the module and Parts division’s sales growth in 2009 was driven by several major factors: a weaker won and increased production in China, growth in mechatronics and multimedia products since the acquisition of Hyundai Automotive Systems, and more parts sourced on new models. Mobis purchased Hyundai Automotive Systems in 2009 and now supplies nearly 100% of Hyundai’s and Kia’s infotainment systems.

Modules and Parts sales in the United States fell by 17.2% due primarily to lower production by Chrysler. Service Parts sales dropped by 60% in the U.S. The largest growth, 74%, came in China, where tax incentives spurred sales of small cars. Hyundai’s module unit sales in China increased 94% in 2009.

Hyundai Mobis and LG Chem are partners in a joint venture announced in August 2009 that will produce lithium-ion batteries for electric cars. Production is scheduled to begin in mid-2010 and eventually ramp up to 200,000 units annually.

Mobis owns 21% of Hyundai Motor. Kia Motor Corporation owns 18% of Hyundai Mobis.

Hitachi Automotive Systems Segment

2009's operating loss of ¥62,507 million ($682.5 million) due to improved capacity utilization and cost cutting.

Outlook for FY 2011: A automotive Systems revenue is forecast to grow 6.4%, to ¥680 billion ($7.42 billion). Hitachi expects a 2.5% operating profit margin for the segment.

Hitachi attributes its sales decline to sluggish demand worldwide in the first half of the fiscal year. Sales in the second half of the year improved with the recovering vehicle market in North America and increased sales in China. Government incentives for new fuel efficient cars also helped strengthen sales globally in the second half.

The company will continue its structural reforms through 2010 and will concentrate resources on powertrain and engine management technologies that contribute to fuel savings and reduced emissions.

Pioneer Car Electronics Business Segment

FY 2010 Operating Loss: ¥5,486 million ($59.9 million), much improved from FY 2009's operating loss of ¥62,507 million ($682.5 million) due to improved capacity utilization and cost cutting.

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Hitachi attributes its sales decline to sluggish demand worldwide in the first half of the fiscal year. Sales in the second half of the year improved with the recovering vehicle market in North America and increased sales in China. Government incentives for new fuel efficient cars also helped strengthen sales globally in the second half.

The company will continue its structural reforms through 2010 and will concentrate resources on powertrain and engine management technologies that contribute to fuel savings and reduced emissions.

Car Electronics accounts for nearly 57% of total Pioneer Corporation sales. Sales of both major products, car navigation and car audio, declined in fiscal 2010. Navigation sales were down because of slower demand in the aftermarket sector in Japan, Europe and North America as well as reduced demand on the OEM side in Japan and North America. OEM sales of car audio products improved with the help of healthy markets in Japan and China. Overall, OEM sales accounted for 44% of the Car Electronics segment’s total sales, slightly higher than last year’s 41% share.

Much of Pioneer’s focus has been on cost cutting and raising capital. Through the sale of new shares in an international offering and in third-party allotments to Honda Motor, Mitsubishi Electric and Mitsubishi Chemical, Pioneer raised ¥34.9 billion ($381 million) in March 2010. It also obtained ¥89.4 billion ($976 million) in new loans and is no longer in breach of its financial covenants for its existing loans.

Further cost cutting in Car Electronics will come in part through standardization and sharing of parts, components and modules, and by cooperating with Mitsubishi Electric in the development of car navigation software and platforms.

In the fall of 2009, Pioneer filed patent infringement lawsuits against the portable navigation device maker Garmin in Germany and the United States and is attempting to prevent Garmin from importing PDAs into the U.S.

Continued from page 3

and internal lights, but lighting design is really a high-tech area now. Some high-tech lighting suppliers are here from Japan and Korea, but they only offer designs they have already done for their main customers back home. And finally, we need more switch manufacturers in India."

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