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Redarc attends the 10th International CAN Conference.

Michael Obst is REDARC's Operations Manager and has been working in the electronics industry for over 20 years. He has recently returned from Rome where he attended the 10th International CAN Conference. Attending this conference were representatives from various industries including automotive, medical, railroad, industrial automation, building elevators and academia. This variety provides some insight into the increasing acceptance of CAN for any form of control or communication in harsh environments.

The conference could be divided into five quite distinct segments;

1. The academic experts who described their research into new technologies,
2. The applications experts who described how they applied CAN to a new problem,
3. The systems experts who primarily presented the limitations of the existing standards and possible solutions,
4. The interface experts who primarily presented possible solutions to the translation of one CAN protocol to other protocols,
5. The protocol experts who primarily presented the methodologies behind the different protocols and their advantages over the others.

The first segment was ideal for other academics wanting to know the absolute state of technology in CAN, but for those who wanted to know about "today's issues", it was really only for interest.

The second segment was ideal for those who didn't really know what they wanted to use CAN for, and were hoping for some suggestions. They tended to be application specific, such as "control panels for electric trains in Europe", and once again were only for interest.

The last three segments held the greater interest for those interested in extending their knowledge of CAN generally.

Segment 3 discussions on standards also covered issues with interoperability of certified CAN components. For example, it highlighted some shortcomings with the way these modules were specified, which meant that under certain combinations and circumstances they would not operate in the same CAN network. Much was related to timing considerations both within the modules and the applications. It appeared that many of these issues (if not all) had become apparent as data speed and throughput had increased to where the existing standards were being challenged. The presentations seemed designed to provoke discussion into how the standards could be enhanced to close these loopholes. Presentations were varied, and ranged from enhancing the inbuilt diagnostic software in applications to detect various timing problems, through to significant changes to the standards documents themselves, and also changes to the certification regime currently available.

Segment 4 discussions on interfacing seemed to be the most important to ensure the continuing growth of CAN applications. Some presentations discussed the interface of CAN with non-CAN protocols such as Ethernet, while others discussed the interface of different CAN protocols. The first type were seeking the expansion of CAN into different environments such as automotive to industrial, while the second type were seeking the expansion of CAN across boundaries within their own environment. An example was a presentation by Ulrich Hiermann of Iveco on interfacing between the SAE J1939 Heavy Vehicle standard and the ISO 11898 standard that was used for rubbish trucks. All these presentations described the need for different Gateways to be specified and developed to enable these cross-protocol communications. This gateway specification generation is very "high level" and would not be within the scope of an individual vehicle manufacturer or electronic module developer. Most manufacturers and developers would simply have to wait until suitable gateways became available on the market.

Segment 5 was very interesting from the point of understanding why there are so many CAN protocols on the market and why more are on the way. Many of the protocols being used now are termed "non-deterministic" which simply means that the response of an output to some stimulus is not defined. It will basically depend on what other stimuli preceded this one of interest. If it happened that two other higher priority stimuli were waiting to be transmitted, then your stimulus of interest will have to wait. If your stimulus of interest occurred when there were not other stimuli occurring, it would most probably get straight through. Hence, for high reliability or safety applications where known timing is essential, the normal CAN protocols are not good enough. One such "deterministic" CAN protocol being developed is TTCAN. The "TT" stands for "Time triggered" and ensures that messages will be sent in a well-defined format. Another example is that the SAE J1939 protocol is very structured and well suited for vehicle applications, but due to its structure is not very flexible. Other more flexible automotive protocols such as ISO 11898 have been developed to bridge this gap.

There are many modules available for CAN implementation and development. For some industries such as Heavy Vehicle, the chosen standard defines which ones can be used. Many of the modules out on display were for analysing the CAN bus. Some of these tools are very expensive, and the general consensus was that the majority of users would perhaps only use up to 30% of its capability. Redarc has nearly completed an analyser that would satisfy the needs of most users more interested in network diagnostics. The biggest hurdle facing the CAN industry as a whole appears to be the interfacing between the different protocols, not the availability of CAN modules per se.

If you would like further information, please do not hesitate to contact Michael Obst, Operations Manager, Redarc Electronics on (08) 8186 5633 or by email mcobst@redarc.com.au.