

MilCAN matters

The deterministic protocol for CAN

Issue 1

1 November 2004

The road ahead for VSI!

A well supported Vetronics Systems Integration (VSI) briefing day was held at MoD Abbey Wood Bristol.

Attendees came from a wide spectrum of companies and organisations including principal MoD representatives involved in vetronics applications.

Exemplary presentations were made on many of the key military vehicle projects. Often reemphasised was the fundamental importance of an agreed specification for vetronics applications both for legacy and future land platforms. These standards are based on existing, industry wide, open standards.

Also, recognised in this success was the ability of many competing companies to come together to work and agree on a common specification.

The benefits of which included quicker development and implementation times and much greater integration of different products and solutions. As stated

"VSI is a changing culture bringing together different companies and organisations in an open manner."

MilCAN has been adopted on many of the

projects presented to delegates and several references were made to the good cooperation between companies in producing this open standard.

Much has been achieved in the formation of VSI and the integration of new technologies can benefit from this open specification.

Key messages during the day included the use of commercial "options" and "open" technologies, VSI is well placed to meet this challenge.

The event concluded with a number of demonstrations which illustrated some of the advance features currently being developed.

The briefing day was sponsored by MoD Director Equipment Capability (Ground Manoeuvre) and supported by QinetiQ in conjunction with Alvis Vickers Ltd, BAE (RO Defence), General Dynamics UK and Thales Defence. More information @

www.vsi.org

www.milcan.org

Andrew Watson
Mil/Aero Business Unit, Deutsch Ltd.



(From R-to-L), Bob Connor (chairman) and Elias Stipidis (vice-chairman) at the 19th MilCAN meeting at the University of Sussex

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19th MilCAN Meeting @ Sussex

The Vetronics Research Centre at the University of Sussex hosted the 19th MilCAN meeting, 14-15 September 2004. There were a number of important issues to be decided for the future direction of MilCAN. The meeting concentrated on publicity and knowledge transfer of the MilCAN experience to the public.

MilCAN was developed over a number of years to provide a definitive integration standard for military land vehicle subsystem communications for deterministic applications. This has been achieved by hard work from all group members and has reached now a stable specification state.

MilCAN can provide a great service for

military applications and is currently in-service for military vehicles. It was therefore decided to expand the usage of MilCAN and promote its valuable assets to the wider civilian/commercial sector by knowledge transfer. One important step towards the objective is the creation of 'MilCAN matters'.

The MilCAN group has also decided to provide a Conformance and Interoperability service which is going to be finalised within the next few months.

The meeting was concluded with the VRC MilCAN testbed demonstration coupled with other R&D demonstrable activities.

Elias Stipidis
VRC Director, University of Sussex

ESTABLISH MILCAN AS THE DEFINITIVE INTEGRATION STANDARD FOR MILITARY LAND VEHICLE SUBSYSTEM COMMUNICATIONS AND TO EXTEND THE USE OF MILCAN INTO THE COMMERCIAL DOMAIN

“The next step of transferring knowledge that the Group has generated over the years to the wider public ...”

Specs online

The MilCAN specifications are available free of charge on the MilCAN website, www.milcan.org. There are currently two specifications, MilCAN A and MilCAN B.

On downloading the MilCAN specification, the user is asked to provide minimal personal details, these details will only be used to keep the user aware of changes to the specification, MilCAN information, and any events that may be taking place in the MilCAN arena.

All users of MilCAN are encouraged to feedback their observations and suggestions as they develop their own applications on MilCAN networks. MilCAN is an open network standard that may be used in military and commercial applications where time deterministic transmission of data is a requirement.

New Vice-Chairman

Following the recommendation of Bob Connor, Chairman of the MilCAN Group, all members agreed and elected Elias Stipidis, Director of Vetronics Research Centre (VRC) at the University of Sussex, as the new Vice-Chairman.

Elias Stipidis expressed his pleasure in accepting the nomination and stated

“It is an privilege for me and the VRC to be able to contribute in the MilCAN Group in whichever way possible. The next step of transferring knowledge that the Group has generated over the years to the wider public is an important challenge that I am sure both the Chairman and I will take serious strategic action to achieve successfully.”

New MilCAN Group Structure

The original objectives of the MilCAN Group were to design and construct a robust, deterministic protocol to support sub-systems integration. The Group has now reached the point where the MilCAN specifications are in a stable state and it was decided to expand its operation to another level.

The MilCAN Group has now three sub-groups with specific missions. All groups conveying decisions through their Leaders to the MilCAN Group for final decisions.

Technical Sub-Group: - Primarily concerned with the maintenance and further additions of the current MilCAN specifications, as well as oversee the overall technical issues and questions raised by members and non-members. The leader of the sub-group is Robert Chesney, RD.

Conformance Sub-Group: - Closely related to the Technical Sub-Group, its purpose is to identify and specify Conformance and Interoperability testing matrices and procedures for current and future MilCAN products. The leader of the sub-group is Richard McLaughlin, WCT.

Publicity Sub-Group: - This Sub-Group has the challenging task of establishing new dissemination corridors and transferring knowledge to the wider defence and civilian related commercial sectors. The leader of the sub-group is Bob Connor, QQ.

To enquire on how to become a MilCAN Member and join any of the above groups please use contact details at the end of the newsletter.

Chairman's Voice

Welcome to the first edition of “MilCAN matters”. The intention is to issue this newsletter twice per year to coincide with MilCAN meetings.

The current focus in the MilCAN group is to continue to improve the specifications through the feedback of member companies as they implement the protocol. In addition, it is recognised that purely textual specifications are often open to interpretation, hence, there is a desire to supplement the specifications with UML diagrams wherever possible and to add implementation notes as clarification. It is expected that improved specifications will be available by April 2005.

It is also recognised that attention must be paid to providing a facility that will allow conformance testing. Work has begun to define conformance matrices against which test procedures can be written.

MilCAN has been included in a NATO STANAG (standards agreement) which is currently in the ratification process. STANAG 4628 Rev 1 is based on Controller Area Network high layer protocols and includes CANopen, SAE J1939 and CUP as well as MilCAN.

Membership of the group continues to grow with the most recent addition being Deutsch UK. Joining the group is relatively painless and is, at present, free. However, we are looking for members who are keen to actively enhance MilCAN as a protocol and provide some relevant experience.

After some debate MilCAN has now launched it's new logo (see website www.milcan.org). The conditions on the use of this logo are stated in the website.

Bob Connor
VSI Technical Leader
QinetiQ Ltd

The first implementation of MilCAN on a UK military vehicle. As part of the Digitisation of the Battlespace (Land) Programme, the Challenger 2 (CR2) Main Battle Tank manufactured by BAE Systems Land Systems has been integrated with new technologies communicating via a MilCAN Bus to improve the vehicle Commander's Situational Awareness (SA).

Critical to any fighting force is the concept of SA, where, information such as, 'where am I?' or 'where is the enemy?' would allow Battlefield Commanders to make better tactical decisions in a reduced timeframe. In addition to SA is the mission planning capability, which provides the Commander with the capability to generate and monitor orders, reports, overlays etc.

The current mechanism for command and control on the battlefield is based largely on manual processes for the monitoring and planning of operations. It relies on the use of hand-written logs, manual map boards and hand-drawn overlays. Furthermore, at the tactical level, there is no automated command and control support for fighting vehicle crews.

The Platform Battlefield Information System Application (PBISA) System for CR2 interfaces with both new and legacy platform sub-systems, capturing platform derived sensor information that augments the Situational Awareness picture and other Battlefield Management System reporting functions.

It features two computing platforms working together to optimise the integration into the vehicle. The P-BISA Processor Unit

(PBPU) supplied by General Dynamics UK provides moving map and situational awareness data to the vehicle Commander, whilst the Digitisation Processor Unit (PDPU) supplied by BAE Systems Land Systems acts as a firewall processor between PBISA and the real time processor of the weapon system. Both computers are able to communicate across the MilCAN data bus.

The CR2 navigation system uses both GPS and inertial data to provide the vehicle crew with positional and heading information. The PDPU processes the navigation information and populates the MilCAN data bus with accurate and up to date position data. The MilCAN databus allows this position information to be made available to the Commander and Driver at their respective displays in a simple and easy to read format.

Development of the PDPU application software was undertaken on the BAE Systems Land Systems PBISA Platform Integration Facility (PIF). The PIF provides a lab environment representative of the CR2 vehicle and makes use of software emulators to simulate the operation of major system components.

The PBISA system has been the subject of rigorous user trials carried out by the British Army and CR2 regiments are already in conversion.

www.alvisvickers.co.uk
www.generaldynamics.uk.com

Abdul Qabaz
 BAE Systems Land Systems

VRC MilCAN Testbed

The Vetronics Research Centre (VRC) at the University of Sussex has established a MilCAN Testbed facility as part of a research programme funded by the UK Ministry of Defence.

This facility accommodates Automotive, Utilities, and Multimedia CAN segments with various sub-system nodes for engine, acceleration, lights etc. All the testbed is based on a MilCAN A stack and a Standard Vetronics Interface (SVI) for bridging MilCAN to MilCAN segments and MilCAN to Ethernet networks.

The rig is also equipped with a mobile unit with various functionalities such as

acceleration/vibration sensors and live

video. All functionality on the rig is controlled by a simulated crew station and live video display. The whole system is configured and monitored by another mobile unit via WLAN. The GUI has diverse functionality and is able to access all the individual rig elements in an ad-hoc manner.

The rig is a comprehensive representation of a military vehicle based architecture where sub-system integration is achieved using MilCAN.

www.vetronics.org

MilCAN Projects



Challenger 2

“The first implementation of MilCAN on a UK military vehicle.”



VRC MilCAN Testbed

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BACKGROUND AND WHAT YOU
CAN OFFER TO MILCAN**

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