RUGGED VETRONICS SYSTEMS
Rapid and reliable information networks are essential for today's highly mobile and dynamic military operations. Vehicle-mounted information technology is changing the battlefield, providing capabilities vital for both force projection and force protection.

Saab offers a wide range of rugged vehicle electronics (vetronics). Solutions that ensure that the harsh environmental requirements for battlefield use are met and that performance remains high, while keeping lifecycle costs to a minimum.

Whether your need is minimum space or maximum capability, Saab provides a rugged system that meets your exact application and secures your operational capabilities.
Saab’s VETRONICS EQUIPMENT can be configured for a wide range of applications – from complete system solutions for heavy fighting vehicles to simpler solutions for lighter vehicles and the deployed soldier.

A heavy vehicle configuration can include computers, keyboards and displays for driver, commander and gunner, cameras for 360 degree view, IR cameras for sand/fog visibility, rear view display for transported troops and adapters for connection of weapons and sights to the video system. All integrated in a LAN network.

For a smaller 4 x 4 vehicle or a truck, two operator stations with a combined display/computer connected to a video and an IR camera will radically improve the driver’s capabilities at night and in fog.

The Rugged Soldier System is a portable PC platform containing three units – a computer, a small display and a battery pack.

INTEGRATION – IMPROVING PERFORMANCE

Forces involved in mission-critical operations must be able to respond with agility to secure the distribution information throughout the command structure, all the way to the outermost nodes in their network – the soldiers in the field. Vehicle electronics is a vital part of such a capability. In order to suit the confined spaces of military vehicles, the size, weight and power requirements of these systems must be minimized while functionality and performance are optimized.

With Saab at your side you will be ensured a rugged technology empowered with the performance, efficiency and capabilities needed to keep your vehicles running with the evolving processing and communication requirements of today’s military operations. Our rugged vehicle electronics offer includes a complete product family supporting the latest generation of Electronic Architecture (EA), Battle Management Systems (BMS) and Local Situational Awareness Systems (LSAS).
All equipment is prepared for use in the most extreme environmental conditions including vibration, shock, humidity, moisture, temperature and EMI. It is also designed for fixed installation in vehicles. External damping devices are not required.

Our product range is qualified according to different military standards including MIL-STD-810G and MIL-STD-461F and handles a wide range of operating and storage temperatures.

The main design features are military-standard connectors, climatically sealed housings, easy maintenance, few parts and low power requirement. All products are also prepared for future functionality and provide instant start-up. Our product range includes:

- RUGGED VEHICLE DISPLAYS
- RUGGED DISPLAY COMPUTERS
- RUGGED VEHICLE COMPUTERS
- RUGGED SOLDIER EQUIPMENT
- VIDEO SENSORS AND ADAPTERS
- TEST AND MEASURING EQUIPMENT
- RUGGED ETHERNET PRODUCTS
- RUGGED PERIPHERAL EQUIPMENT
Examples of application areas:

- **HEALTH AND USAGE MONITORING SYSTEM**
  Saab’s rugged computers and displays can easily be used for vehicle Health and Usage Monitoring systems (HUMS). HUMS gives the driver or vehicle commander better control over vehicle status by displaying key information such as fuel level, oil pressure, speed and fault codes. The HUMS system can also comprise other relevant functions such as an instant debugging system and vehicle manuals.

- **CAMERA AND VIDEO DISTRIBUTION SYSTEM**
  One vital capability is to have accurate situational awareness of the area outside the vehicle. Saab’s camera and video distribution system, which has true all-hours capability, integrates video from different cameras on the vehicle, thus enhancing the soldier’s local situation awareness in real time.

  The system updates with such high resolution and low latency that the driver can use it while driving. This offers a better situational image in poor weather or at night via infrared cameras. The imagery can also be used by mounted soldiers to obtain visuals on what is happening outside the vehicle – and beyond – before deploying.

- **BATTLE MANAGEMENT SYSTEM**
  Battle Management Systems plays an important role on the modern battlefield. The Rugged Vetronics network makes it possible to give all positions in the vehicle access to relevant parts of the Battle Management System, so everyone on board shares the same situational image. A Battle Management System can also be combined with sensor images from different sources such as remote weapon stations and cameras to ensure full local situational awareness capability. This provides invaluable data both for issuing orders and for ensuring accurate battlefield assessment.

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**VEHICLE INTEGRATION**

**ELECTRONIC ARCHITECTURE**

Our philosophy in vehicle integration of Rugged Vetronics is quite simple. Every component and every function is based on a common, expandable and scalable architecture. Seamlessly integrated, all sub-systems and elements understand each other and share hardware and network structures.

The advantages are obvious: any kind of information can be directed to any user. So several users can share real-time information and you can also, for instance, show HUMS data, camera images and BMS data on the same screen.
RUGGED VEHICLE DISPLAYS

The rugged vehicle display (RVD) family contains multifunctional display units that are scalable to support different presentation modes: graphics (DVI-D) or video, video on graphics or video on video. Based on a TFT display with LED-backlight technology.

Optionally the units can be configured to process Gigabit-streamed digital video input/output (part of Saab Video Distribution Systems including e.g. Saab VDS-format, GigE Vision, Def Stan 00-82, STANG 4609). The units also support dynamic graphics overlay etc. In stand-alone applications, by adding Internal GUI firmware, the presentation is controlled via onscreen menu selections by use of the touchscreen and/or function keys. In standard configuration it is designed to be connected to the Saab Rugged Vehicle Computer (RVC) via one single cable. The standard unit is equipped with one rear, straight-out connector (Computer port) type MIL-C-38999, series 3. Optionally, to gain access to additional interfaces, up to three rear connectors can be included facing straight out, upwards or downwards.

RUGGED VEHICLE DISPLAY 6 INCH

The Rugged Vehicle Display, RVD6, is a multifunction display unit. The unit is scalable to support different presentation modes: graphics (DVI-D) or video, video on graphics or video on video. Optionally the unit can be configured to process Gigabit-streamed digital video input/output (part of the Saab VDS-concept). In stand-alone applications, by adding Internal GUI firmware, the presentation is controlled via onscreen menu selections by use of the touchscreen and/or function keys.

RUGGED VEHICLE DISPLAY 10 INCH

The Rugged Vehicle Display, RVD10, is a multifunction display unit (Saab Core version). The unit is scalable to support different presentation modes: graphics (DVI-D) or video, video on graphics or video on video. Optionally the unit can be configured to process Gigabit-streamed digital video input/output (part of the Saab VDS concept). In stand-alone applications, by adding Internal GUI firmware, the presentation is controlled via onscreen menu selections by use of the touchscreen and/or function keys.

RUGGED VEHICLE DISPLAY 12 INCH

The Rugged Vehicle Display, RVD12, is a multifunction display unit (Saab Core version). The unit is scalable to support different presentation modes: graphics (DVI-D) or video, video on graphics or video on video. Optionally the unit can be configured to process Gigabit-streamed digital video input/output (part of the Saab VDS concept). In stand-alone applications, by adding Internal GUI firmware, the presentation is controlled via onscreen menu selections by use of the touchscreen and/or function keys.

RUGGED VEHICLE DISPLAY 15 INCH

The Rugged Vehicle Display, RVD15, is a multifunction display unit (Saab Core version). The unit is scalable to support different presentation modes: graphics (DVI-D) or video, video on graphics or video on video. Optionally the unit can be configured to process Gigabit-streamed digital video input/output (part of the Saab VDS concept). In stand-alone applications, by adding Internal GUI firmware, the presentation is controlled via onscreen menu selections by use of the touchscreen and/or function keys.

RUGGED VEHICLE DISPLAY 20 INCH

The Rugged Vehicle Display, RVD20, is a multifunction display unit. The unit is scalable to support different presentation modes: graphics (DVI-D) or video, video on graphics or video on video. The unit is configured to process Gigabit-streamed digital video input/output (part of the Saab VDS concept). In stand-alone applications, thanks to Internal GUI firmware, the presentation is controlled via onscreen menu selections by use of the touchscreen and/or function keys.

Note: Regarding available options and configurations, please contact Saab.
RUGGED DISPLAY COMPUTERS

The Rugged Display Computers from Saab are rugged high-performance display computer units developed for use in military vehicles. The RDC family has a compact design with low weight and is designed for future functionality. The units are either semi-fixed in place using an optional docking station or permanently installed in the vehicle. With the docking station the unit becomes easy to change to/from a wearable unit to/from a fixed installed unit.

RUGGED PORTABLE DISPLAY COMPUTER 6 INCH

The Rugged Portable Display Computer, RPDC6, a portable display computer unit from Saab (Saab Core version). The RPDC6 includes an Intel Atom platform. In standard configuration, the unit is equipped with one side connector including LAN, USB, and RS interface. To get access to optional electrical interfaces, a fixed connector housing can be added.

RUGGED PORTABLE DISPLAY COMPUTER 10 INCH

The Rugged Portable Display Computer, RPDC10, is the latest portable display computer unit from Saab (Saab Core version). The unit is based on an Intel® Core™ i7 CPU platform. The two side connectors in combination with the fixed connector housing/docking option make the unit ideal for fixed, semi-fixed or wearable applications.

THE RUGGED DISPLAY & COMPUTER UNIT, RDC10

The Rugged Display & Computer unit, RDC10, includes an Intel® Core™ i7 CPU platform, a stand-alone video/graphics processor, a number of external interface ports, a customized front panel and a customized connector housing.

RUGGED PORTABLE DISPLAY COMPUTER 12 INCH

The Rugged Portable Display Computer, RPDC12, is the latest portable display computer unit from Saab (Saab Core version). The unit is based on an Intel® Core™ i7 CPU platform. The two side connectors in combination with the fixed connector housing/docking option make the unit ideal for fixed, semi-fixed or wearable applications.

RUGGED TABLET COMPUTER 10 INCH

The Rugged Tablet Computer, RTC, is a flexible computer platform based on an Intel® Core™ i7 CPU core. The RTC10 is fully rugged high performance display & computer unit developed for use in military environments. The unit is either fixed mounted or semi-fixed mounted by use of an optional docking station.

RUGGED LAPTOP COMPUTER 13 INCH

The Rugged Laptop Computer, RLC, is a flexible computer platform based on an Intel® Core™ i7 CPU core. The RLC13 is a fully rugged high performance laptop developed for military usage, and can be used either stand-alone or fixed mounted in an optional docking station.

DOCKING STATION

With the docking station the unit becomes easy to change to/from a wearable unit to/from a fixed installed unit. When the Rugged Portable Display Computer is used as a wearable unit it runs on a built-in battery.

CONNECTOR HOUSING

A connector housing permits more interfaces on the Rugged Portable Display Computer.
RUGGED VEHICLE COMPUTERS

Compact, stackable, high-performance vehicle and fire control computers equipped with PC-compatible interfaces developed for use in military vehicles. These computers need no external cooling and are designed to provide high levels of performance and reliability in the toughest environments.

The Rugged Vehicle Computer, RVC-IX, is based on the Saab RVC-CORE concept. The unit includes a 3rd Generation Intel Core i7 CPU platform and is equipped with PC-compatible interface ports such as DVI-D, Ethernet, USB etc. The RVC-IX is a rugged, compact, stackable, high-performance computer unit developed for use in military vehicles. All electronics are protected in a sturdy, sealed housing. No external cooling is needed.

The Fire Control Computer, FCC, is a VME-based concept including three separate VME computers, two Power-PC Single Board Computers and one Intel-based Single Board Computer. The FCC is a rugged, high-performance computer system developed for use in military vehicles. All electronics and conductive cooled VME boards are protected in a sturdy housing. No external cooling is needed.

RUGGED SOLDIER EQUIPMENT

Rugged Soldier Equipment designed to provide the individual soldier access to rapid and reliable information. This portable product family has a compact design with low weight and is designed and prepared for future functionality.

sPAD is a lightweight, handheld soldier equipment used for map presentation, orientation, communication and Blue Force Tracking. It consists of a Ruggedized Handheld Pad (RHP) and a Ruggedized Hub for connecting to various peripherals such as GPS receivers, radios and video sources etc.

The Rugged Communication Unit (RPCU) is the central part of the soldier IGR (Inter/Intra Group Radio) communications solution. The RPCU is worn by individual soldiers and makes it possible to connect various types of radios/intercom systems and communication headsets. Apart from the RPCU, the concept also includes a Wireless PTT device (WPPT), a number of cables to connect to radios and headset and programming equipment (PC-application SW + USB-cable).

The Rugged Portable Computer (RPC) Rugged Portable Display 5” (RPD5) and Rugged Portable Battery (RPB) units are included in the Saab wearable soldier display and computer system based on an Intel ATOM platform and smart lithium battery technology. The RPC provides PC-compatible interfaces such as DVI, USB, RS232/422 and LAN.

Note: Regarding available options and configurations, please contact Saab.
VIDEO SENSORS AND ADAPTERS

This product group includes rugged and compact cameras for manual or automated applications, adapters for cameras and displays allowing legacy analog video equipment to connect with Saab’s video distribution system.

RUGGED VDS GATEWAY

The Rugged VDS Gateway, RVG, is a compact, high-performance and low-power unit including functions mainly for conversion of the Saab VDS Ethernet format to H.264/MPEG-4 according to STANAG 4609.

RUGGED CAMERA

The Camera Unit (RCAM) is a rugged, compact high-resolution camera module for the Saab video distribution system and is designed for applications where space is limited such as helicopters, military vehicles and vessels. All electronics are protected in a rugged, sealed housing and no preventive maintenance is required. The housing is highly scalable and prepared for inclusion of different camera modules: progressive VGA/XGA, PAL or LWIR.

RUGGED CAMERA – IR

The Camera Unit (RCAM-IR) is a rugged, compact high-resolution camera module for the Saab video distribution system and is designed for applications where space is limited such as helicopters, military vehicles and vessels. All electronics are protected in a rugged, sealed housing and no preventive maintenance is required. The housing is highly scalable and prepared for inclusion of different camera modules: progressive VGA/XGA, PAL or LWIR.

CAMERA MODULE

The Camera Unit (CM) is a rugged, compact high-resolution camera module for the Saab video distribution system and is designed for applications where space is limited such as helicopters, military vehicles and vessels. All electronics are protected in a rugged, sealed housing and no preventive maintenance is required. A protective hatch automatically covers the lens when the CM is not in use.

TEST AND MEASURING EQUIPMENT

GENERIC TEST EQUIPMENT

The GTE is a rugged generic test platform primarily designed for testing and measuring of integrated systems, for instance in armoured vehicles. With the integrated Expert System guiding the operator in fault diagnosis, the system will propose and execute suitable measurements to finally pinpoint the probable fault cause. For display and control of the GTE any standard computer can be used. In its standard configuration the GTE is designed for the Leopard 2 main battle tank, but due to its modular design it can also be adapted to numerous other applications.

Note: Regarding available options and configurations, please contact Saab.
RUGGED ETHERNET PRODUCTS

Ethernet and network switches for copper and fibre communication, Discrete I/O Adapters, Security Computers, Routers and Rugged Storage Units.

RUGGED ETHERNET SWITCH 8 PORTS

The Rugged Ethernet Switch RES8 is a compact high-performance Ethernet switch designed for use in military combat vehicles. In base configuration the unit comes with 8 copper gigabit ports and has basic layer2 management functionality.

RUGGED ETHERNET SWITCH 16 PORTS

The Rugged Ethernet Switch RES16 is a compact high-performance Ethernet switch designed for use in military combat vehicles. In base configuration the unit comes with 16 copper gigabit ports and has basic layer2 management functionality. The unit may also be fitted with 100 Mbps fibre ports and layer3 routing and security functions provided by an on-board network processor.

RUGGED ETHERNET SWITCH 26 PORTS

The Rugged Ethernet Switch RES26 is a compact high-performance Ethernet switch designed for use in military combat vehicles. The unit comes with 24 copper gigabit ports as well as two 10Gbps fibre-optic ports and has basic layer2 management functionality.

RUGGED ETHERNET LAN FX SWITCH-01

Switch-01 is a rugged network switch with eight Ethernet 10/100BASE FX ports. The switch supports a number of features such as IEEE 802.3, IGMP v2 etc.

RUGGED ETHERNET LAN FX SWITCH-02

The Switch-02 is a rugged 10/100 Megabit Ethernet Switch unit. The Ethernet Switch has four 10/100BASE FX ports and two Ethernet 10/100BASE T(X) ports.

RUGGED NETWORK DISCRETE I/O ADAPTER

The Rugged Network Discrete I/O Adapter (RNDA) is a rugged and compact Ethernet to discrete input/output converter unit. The unit features both copper and fibre LAN connections and has a number of discrete inputs and outputs which are readable and controllable via the SNMP protocol.

RUGGED SECURITY COMPUTER

The Rugged Security Computer (RSC) is a robust and compact computer unit designed for use in military vehicles. The RSC is designed for severe environmental conditions including vibration, shock, humidity, moisture, temperature, EMI etc. The RSC is an upgraded replacement for an earlier product, FWC, and is fully compatible with FWC regarding mechanics, interfaces and connector configuration.

RUGGED ROUTER

The Rugged Router is a rugged and compact router unit designed for use in military vehicles. The Rugged Router is designed for severe environmental conditions including vibration, shock, humidity, moisture, temperature, EMI etc.

RUGGED STORAGE UNIT

The Rugged Storage Unit (RSU) is a compact, high-performance and low-power unit based on an Intel Atom CPU platform and optional hardware accelerated video compression functions. The unit offers network file server functionality and data logging, and may be configured for analog or digital video recording and playback.

Note: Regarding available options and configurations, please contact Saab.
RUGGED PERIPHERAL EQUIPMENT

A range of rugged and compact products designed to enhance user capabilities, including products such as keyboard, video and mouse switches, GPS equipment, USB hubs, portable memories, external CD/DVD units, smart card readers and flash discs.

RUGGED GPS RECEIVER

The Rugged GPS Receiver (GPSSR) is an active GPS antenna with integrated receiver, designed for use in military vehicle applications with high demands on mobility and function and built to withstand harsh environmental demands. The unit is selectable-powered via vehicle power or via the USB interface. The GPSSR receives its GPS signal and translates it into NMEA 0183 or UBX. All data are available via the UART or USB 2.0 interface.

RUGGED POWER DISTRIBUTION UNIT

The Rugged Power Distribution Unit, RPDU, is designed for power distribution in military vehicles. The RPDU includes power filters, overvoltage/ transient protection and output current limitation functions.

RUGGED USB HUB

The Rugged USB Hub (RUH) is a sturdy and compact USB 2.0-Hub. The RUH includes one USB up-link port and four down-link ports. When disconnected/ reconnected the RUH is automatically detected as a USB-HUB (hot-swap).

RUGGED SERIAL PORT ADAPTER

The Rugged Serial Port Adapter (RSPA) is a sturdy and compact USB to serial port converter unit. The RSPA is configured as a USB-device with four RS232 serial ports. The RS ports are configurable for RS422, no hardware handshake, via jumpers on board level.

RUGGED KEYBOARD

The Rugged Keyboard (RKB) is a sturdy and compact computer keyboard with standard "QWERTY" layout. The unit contains a pointing device which makes it possible to exclude an external pointing device. The keys are also backlit in order to operate in darkness.

RUGGED USB REPEATER

The Rugged USB Repeater (RUR) is used for USB cable extension. The unit is self-powered; it requires power supply from the vehicle, typically via an adjacent computer or display unit. One RUR supports up to 8 m cable length, but the unit can also be cascaded for even longer cables.

RUGGED DVI/USB REPEATER

The Rugged DVI/USB Repeater (RVR) is used for DVI and/or USB cable extension. The unit is self-powered; it requires power supply from the vehicle, typically via an adjacent computer or display unit. One RVR supports up to 8 m cable length, but the unit can also be cascaded for even longer cables.

RUGGED EXTERNAL SMARTCARD READER

The Rugged External Smartcard Reader (RESR) is a sturdy and compact Smartcard reader specially designed for use in harsh environments such as combat vehicles.

CABLES

Military cables and cable kits for all systems specially designed for use in harsh environments such as combat vehicles.
SUPPORT SOLUTIONS

To optimize support and maintenance we thoroughly analyze each client’s specific needs. Our goal is to design a solution where we interact perfectly with the existing organization. No gaps. No overlap. Our top priority is to focus on client demands regarding availability, reliability and cost effectiveness.

The Saab Support Model develops and applies support in the following distinct phases:

- **INITIAL SUPPORT**
- **IN-SERVICE SUPPORT**
- **EXTENDED SUPPORT**
- **ADD-ON OPTIONS**

Applying our Support Model provides you with a thorough lifecycle support solution with secured readiness, operational effectiveness and economic maintenance.
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