## VT System Overview

### Module Overview and Accessories

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>Channels</th>
<th>Key Performance Characteristics</th>
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</table>
| **Load and Measurement Modules (+/- 40 V):** VT1004A FPGA | Measurement of ECU outputs and connection of actuators | 4 | • Differential inputs  
• Electronic load  
• Current carrying capacity up to 16 A (continuous)  
• Also available with user-programmable FPGA |
| **Load and Measurement Modules (+/- 60 V):** VT1104 | Measurement of ECU outputs and connection of actuators | 4 | • Differential inputs  
• Electronic load  
• Current carrying capacity up to 16 A (continuous) |
| **Stimulation Module:** VT2004A FPGA | Stimulation of ECU inputs and connection of sensors | 4 | • Differential outputs  
• Decade resistor  
• Arbitrary curve generator  
• Also available with user-programmable FPGA |
| **Digital Module:** VT2516A FPGA | Connection of ECU inputs and outputs that are used in digital form | 16 | • Voltage and PWM measurement  
• Output of digital and PWM signals  
• Also available with user-programmable FPGA |
| **Serial Interface Module:** VT2710 | Simulation of intelligent sensors and ECUs with serial interface | 10 | • Up to 4 freely configurable PSIS and SENT channels  
• 2 SPI channels with 5 chip select lines each  
• 2 UART / RS232 / RS422 / RS485 channels  
• 2 I2C channels  
• Additional 2 LVDS channels for active probes |
| **Piggyboard Module:** PSI5SENTpiggy | Piggyboard module for the realisation of one PSI5 or SENT channel on the serial interface module VT2710 | 1 | • Sensor supply with up to 25 V / 200 mA  
• Generation of PSI5 synchronisation pulses with freely adjustable voltage, slope and hold time  
• Generation of current modulated signals with free setting of low and high current levels and data rates up to 200 kBit/s  
• Creation of shortcuts on PSI5 or SENT channels  
• Simulation of various resistive or capacitive loads for the complete bus channel or single components |
| **General-Purpose Analog I/O Modules:** VT2816 FPGA | Analog inputs and outputs with signal conditioning | 16 | • 4 analog outputs  
• 12 analog measuring channels up to 60 V  
• 8 current measurement channels up to 5 A  
• Also available with user-programmable FPGA |
| **General-Purpose Relay Module:** VT2820 | Relays for individual wiring and use | 20 | • Current-carrying capacity up to 6 A per relay |
| **Switch Matrix Module:** VT2832 | Matrix module for individual switching of currents | 8 columns x 4 rows | • Up to 16A / 60V per column  
• Current and voltage measurement per column  
• PWM switching up to 10 kHz and bitstream switching  
• 4 additional pure switch channels |
| **General-Purpose Digital I/O Modules:** VT2848 FPGA | Digital inputs and outputs with signal conditioning | 48 | • Processes signals up to 60 V  
• Generating and measuring of PWM signals  
• Also available with user-programmable FPGA |
| **Real-time Module:** VT6011 | PC module for executing the real-time part of CANoe with the VT System | 2 PCI Express | • Intel® Celeron® 2.0 GHz processor  
• PCI Express connections for VT System network modules  
• Passive cooling, no fan |
| **Real-time Module:** VT6051A | High-performance PC module for executing the real-time part of CANoe with the VT System | 4 PCI Express | • Intel® Core™ i7, 2.50 GHz processor  
• PCI Express connections for VT System network modules  
• Regulated fan, requires 2 slots  
• Support of Extended Realtime (ERT) from the Vector Tool Platform (VTP) |
| **Network Module:** VT6104A | Network interface for the real-time modules VT6011 and VT6051A in the VT System | 4 | • Supports CAN, LIN, J1708, CAN FD, K-Line  
• Switchable termination resistors  
• Relays for line breaks and short circuits |
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<tr>
<td>Network Module: VT6204</td>
<td>Identically to VT6104A</td>
<td>4</td>
<td>• Identically to VT6104A, supports additionally FlexRay</td>
</tr>
<tr>
<td>Ethernet Network Module: VT6306</td>
<td>Automotive Ethernet network interface for the real-time modules VT6011 and VT6051A in the VT System</td>
<td>6</td>
<td>• 6 Automotive Ethernet channels on specific piggy&lt;br&gt;• Two 100BASE-TX/1000BASE-T channels&lt;br&gt;• High precision time stamps for Ethernet frames&lt;br&gt;• HW sync (1μs) with multiple bus interfaces&lt;br&gt;• Media conversion between Ethernet networks&lt;br&gt;• Flexible hardware-based frame filter&lt;br&gt;• Multiple, configurable TAP units&lt;br&gt;• Configurable layer-2 switch mode</td>
</tr>
<tr>
<td>Piggyboard Module: 100BASE-T1piggy 1101 1000BASE-T1piggy 88Q2112</td>
<td>Piggyboard module for the realization of six 100BASE-T1 rsp. 1000BASE-T1 channels on the Ethernet network module VT6306</td>
<td>6</td>
<td>• Electrical error injection and signal switching&lt;br&gt;• Transceiver NXP TJA1101 rsn. Marvell 88Q21112 on all channels&lt;br&gt;Only with 100BASE-T1piggy:  • Adjustable signal attenuation on 3 channels&lt;br&gt;• Resistive damping values of 5 Ω ... 2,555 Ω</td>
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<tr>
<td>Power Supply Module (+/- 40 V): VT7001A</td>
<td>Power connection to an ECU’s power supply terminals (e.g. Terminal 15 and Terminal 30 of an ECU)</td>
<td>2</td>
<td>• Controls 2 external power supplies by RS-232 and analog voltage&lt;br&gt;• Internal power supply (max. 2 A)&lt;br&gt;• Current carrying capacity up to 70 A (continuous)&lt;br&gt;• Current measurement (auto-ranging 100 μA ... 100 A)</td>
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<tr>
<td>Power Supply Module (+/- 60 V): VT7101</td>
<td>Power connection to an ECU’s power supply terminals (e.g. terminal 15 and terminal 30 of an ECU)</td>
<td>2</td>
<td>• Controls 2 external power supplies by RS-232 and analog voltage&lt;br&gt;• Internal power supply (max. 2 A)&lt;br&gt;• Current carrying capacity up to 70 A (continuous)&lt;br&gt;• Current measurement (auto-ranging 100 μA ... 100 A)</td>
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<tr>
<td>Rotation Sensor Module: VT7820</td>
<td>Application board for the extension module VT7900 FPGA to simulate rotational sensors</td>
<td>4</td>
<td>• Simulation of wheel speed sensors (S-, I- and V-type)&lt;br&gt;• Simulation of cam- and crankshaft sensors&lt;br&gt;• Number of encoder wheel teeth and gaps freely configurable&lt;br&gt;• Voltage or current modulated signal&lt;br&gt;• Digital levels and slew rate freely adjustable</td>
</tr>
<tr>
<td>Extension Module: VT7900A VT7900A FPGA</td>
<td>Extension of VT System by easy integration of application-specific electronics</td>
<td>—</td>
<td>• Platform for application-specific application board&lt;br&gt;• Full integration in CANoe&lt;br&gt;• Also available with user-programmable FPGA</td>
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<tr>
<td>Smart Charging Communication Module: VT7970</td>
<td>Qualcomm-based module for the test of the smart charging communication between electric vehicles and electric vehicle supply equipment</td>
<td>1</td>
<td>• Simulation of an electric vehicle (EV) or an electric vehicle supply equipment (EVSE)&lt;br&gt;• PWM and PLC communication&lt;br&gt;• Qualcomm PLC chip</td>
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<tr>
<td>Backplane: VT8006A</td>
<td>Backplane for communication with the VT System modules in half-width 19” housings</td>
<td>6 Slots</td>
<td>• Unused slots automatically deactivated&lt;br&gt;• Multiple backplanes may be cascaded</td>
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<tr>
<td>Backplane: VT8012A</td>
<td>Backplane for communication with the VT System modules in 19” frames/housings</td>
<td>12 Slots</td>
<td>• Automatic deactivation of unused slots&lt;br&gt;• Multiple backplanes may be cascaded</td>
</tr>
<tr>
<td>Power Supply Module: VTC9920B (available in Europe)</td>
<td>12 V power supply as slide-in module for supplying the VT System</td>
<td>2 Connections</td>
<td>• 200 W output power</td>
</tr>
<tr>
<td>Desktop Housing 42 HP</td>
<td>Desktop housing in half 19” width</td>
<td>6 Slots</td>
<td>• For installing the VT8006A backplane&lt;br&gt;• Additional space for circulation of cooling air</td>
</tr>
<tr>
<td>Desktop Housing 84 HP</td>
<td>Desktop housing in full 19” width</td>
<td>12 Slots</td>
<td>• For installing the VT8012A backplane&lt;br&gt;• Additional space for circulation of cooling air</td>
</tr>
<tr>
<td>Subrack 84 HP</td>
<td>Subrack in Full 19” width for mounting in 19” racks</td>
<td>12 Slots</td>
<td>• For installing the VT8012A backplane</td>
</tr>
<tr>
<td>Desktop Power Supply</td>
<td>12 V desktop power supply for supplying the VT System</td>
<td>1 Connection</td>
<td>• 150 W output power</td>
</tr>
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