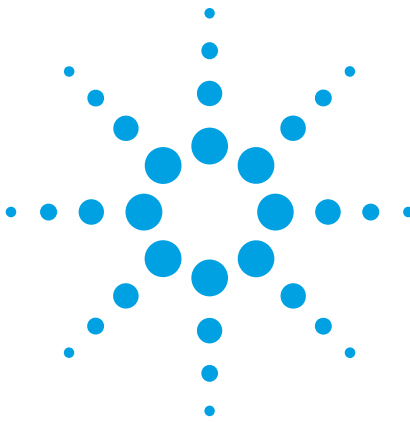


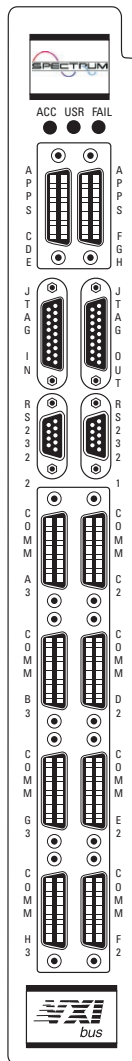
## Agilent SCM VX008

# TI based VXI DSP Module Distributed Product

### Technical Specifications



- Two 60 MHz TI TMS320C40 DSPs
- Six TIM-40 mezzanine card slots
- Eight C40 comm ports on front panel
- Local bus support
- VXI shared memory
- Two application specific connectors
- JTAG connection
- Standard C40 software development
- Single-slot, C-size, VXI module



### Concentrated computing power with high performance I/O

The Agilent SCM VX008 signal processing module is a high-performance data acquisition and signal analysis processor. It combines Texas Instrument's TMS320C40 general purpose 32-bit floating point processors running at 60 MHz with user-written, downloaded software to meet the demands of advanced data acquisition and analysis applications.

### Expanded processing power

Increase the computing power in your SCM VX008 by using its six expansion slots to add processors. Each slot holds a TIM-40<sup>1</sup> mezzanine card. Different cards have different combinations of DSP, memory and I/O capabilities. By mixing and matching TIM-40 cards, you can build a parallel processing system suited to the application at hand.



<sup>1</sup> The Texas Instrument Module (TIM-40) for the C40 is a widely accepted mezzanine card standard generated by Texas Instruments.



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### DSP to DSP communication

The TMS320C40 DSP is noted for the DSP-to-DSP communication flexibility provided by its six high speed communication ports. The layout of the SCMVX008 uses that flexibility to move data efficiently among multiple DSPs. Each C40 and TIM-40 node in the module is connected to its five nearest neighbors and to one of the eight buffered C40 comm port connectors on the module front panel.

### High performance I/O

Processing power is wasted without fast and flexible data I/O. The SCMVX008 module has a selection of data ports to assure fast input of raw data and efficient output of processed data.

### Special I/O

The SCMVX008 also has special purpose I/O. Two application specific connectors on the front panel provide direct access to the TIM-40 nodes.

### VXI shared memory

VXI shared memory facilitates data transfer to the host or other VXI modules. Order as much as your processing needs demand. Select as little as 4 MB, or as much as 64 MB.

### Software

Develop software for the SCMVX008 using standard C40 software tools. TI offers a highly proven, mature set of development tools for their TMS320 DSP family. This first class combination of software and support is utilized by a broad range of third parties. TI's C4x Assembler/Linker and ANSI C compiler are available for PCs and HP-UX\* enabling users to develop DSP applications in standard ANSI C.

### Options and accessories

The SCMVX008 has several options and accessories to enhance its functionality.

#### TMS320C40 TIM-40 card (Option 011)

Use this option to increase the number of C40s in your SCMVX008 module. Each Option 011 TIM-40 card adds a single 60 MHz, TMS320C40 DSP with 1.5 MBytes of 0 ws SRAM.

#### Dual TMS320C44 TIM-40 card (Option 012)

Use this card to add two DSPs in your SCMVX008 with one TIM-40 card. Each Option 012 holds two 60 MHz TMS320C44 DSPs. The C44 has the same functionality as the C40 but is enough smaller that two can fit on one TIM-40 card. Each C44 has 1 MB of 0 ws SRAM.

#### Four-channel tuner with DACs (Option 040)

This card provides four independent channels of digital quadrature mixing with digital LOs followed by decimation filtering for use in digital radio applications.

#### Demodulation software (Option 140)

Use this software with the Option 040 four channel tuner and DACs TIM-40 card. Option 140 provides programmatic control of the LOs, filters, and DACs on the card, and provides AM, FM, and SSB routines to demodulate the signals selected by the tuners.

\* HP-UX 9.\* and 10.0 for HP 9000 Series 700 and 800 computers are X/Open Company UNIX 93 branded products.

## Specifications

Specifications describe warranted performance for the system configuration listed. Supplemental characteristics identified as “typical” or “characteristic,” provide useful information by giving non-warranted performance.

### Signal Processor

|                        |                                                     |
|------------------------|-----------------------------------------------------|
| <b>Type:</b>           | TI TMS320C40 (32 bit, floating point)               |
| <b>Clock rate:</b>     | 60 MHz                                              |
| <b>Memory per DSP:</b> | 1 MB SRAM<br>(0.5 MB local, 0.5 MB global each DSP) |
| <b>Number:</b>         | 2                                                   |
| <b>MFLOPS:</b>         | 60 / DSP                                            |

### Data Transfer Rates

|                                                                        |                              |
|------------------------------------------------------------------------|------------------------------|
| <b>Agilent Local Bus to Local Bus Interface Io:</b>                    | 100MB/sec                    |
| <b>Local Bus Interface Io to input FIFO:</b>                           | 60 MB/sec                    |
| <b>Local Bus input FIFO to embedded C40 SRAM (read):</b>               | 80 MB/sec                    |
| <b>Local Bus input FIFO to TIM-40 SRAM (read):</b>                     | 60 MB/sec                    |
| <b>C4X to Local Bus output FIFO (write):</b>                           | 40 MB/sec                    |
| <b>Output FIFO to Local Bus Interface Io:</b>                          | 60 MB/sec                    |
| <b>Local Bus Interface Io to Agilent Local Bus:</b>                    | 100 MB/sec                   |
| <b>C4X SRAM to reading C4X:</b>                                        | 40 MB/sec                    |
| <b>C4X writing to any other C4X SRAM:</b>                              | 40 MB/sec                    |
| <b>VXI Interface to C4X SRAM:</b><br>(read & write, to all C4X's SRAM) | 24 MB/sec<br>(D32 transfers) |
| <b>VXI interface to VXI Shared DRAM:</b><br>(read & write)             | 17 MB/sec                    |
| <b>C4X SRAM to VXI Shared DRAM (write):</b>                            | 20 MB/sec                    |
| <b>VXI Shared DRAM to C4X SRAM (read):</b>                             | 24 MB/sec                    |
| <b>COMM ports to front panel:</b><br>(read & write)                    | 15 MB/sec<br>(sustained)     |

#### VXI power and cooling

##### Module Current (No TIM-40 cards installed)

| Power supply | I <sub>PM</sub> (A) | I <sub>DM</sub> (A) |
|--------------|---------------------|---------------------|
| +5 V:        | 3.44                | 0.620               |
| +12 V:       | 0                   | 0                   |
| -12 V:       | 0                   | 0                   |
| +24 V:       | 0                   | 0                   |
| -24 V:       | 0                   | 0                   |
| -5.2 V:      | 0.737               | 0.024               |
| -2 V:        | 0.165               | 0.007               |

##### Cooling/Slot

|                                 |                          |
|---------------------------------|--------------------------|
| Watts/slot:                     | 21.36W                   |
| Air Flow:                       | 1.78 liters/sec          |
| $\Delta P$ mm H <sub>2</sub> O: | 0.07 mm H <sub>2</sub> O |

##### Option 011: C40 TIM card (Add for each opt 011 installed)

| Power supply | I <sub>PM</sub> (A) | I <sub>DM</sub> (A) |
|--------------|---------------------|---------------------|
| +5 V:        | 0.593               | 0                   |
| +12 V:       | 0                   | 0                   |
| -12 V:       | 0                   | 0                   |
| +24 V:       | 0                   | 0                   |
| -24 V:       | 0                   | 0                   |
| -5.2 V:      | 0                   | 0                   |
| -2 V:        | 0.002               | 0                   |

##### Cooling/Slot

|                                 |                           |
|---------------------------------|---------------------------|
| Watts/slot:                     | 2.97W                     |
| Air Flow:                       | 0.25 liters/sec           |
| $\Delta P$ mm H <sub>2</sub> O: | 0.033 mm H <sub>2</sub> O |

##### Option 012: Dual C44 TIM card (Add for each opt 012 installed)

| Power supply | I <sub>PM</sub> (A) | I <sub>DM</sub> (A) |
|--------------|---------------------|---------------------|
| +5 V:        | 1.0                 | 0                   |
| +12 V:       | 0                   | 0                   |
| -12 V:       | 0                   | 0                   |
| +24 V:       | 0                   | 0                   |
| -24 V:       | 0                   | 0                   |
| -5.2 V:      | 0                   | 0                   |
| -2 V:        | 0                   | 0                   |

##### Cooling/Slot

|                                 |                           |
|---------------------------------|---------------------------|
| Watts/slot:                     | 5.00W                     |
| Air Flow:                       | 0.42 liters/sec           |
| $\Delta P$ mm H <sub>2</sub> O: | 0.033 mm H <sub>2</sub> O |

##### Option 040: Four-channel tuner TIM-40 card (Add for each opt 040 installed)

| Power supply | I <sub>PM</sub> (A) | I <sub>DM</sub> (A) |
|--------------|---------------------|---------------------|
| +5 V:        | 0.340               | 0.235               |
| +12 V:       | 0.094               | 0.030               |
| -12 V:       | 0                   | 0                   |
| +24 V:       | 0                   | 0                   |
| -24 V:       | 0                   | 0                   |
| -5.2 V:      | 0                   | 0                   |
| -2 V:        | 0.080               | 0.021               |

##### Cooling/Slot

|                                 |                           |
|---------------------------------|---------------------------|
| Watts/slot:                     | 2.99W                     |
| Air Flow:                       | 0.26 liters/sec           |
| $\Delta P$ mm H <sub>2</sub> O: | 0.033 mm H <sub>2</sub> O |

**Instrument Drivers**

|                                                              |      |
|--------------------------------------------------------------|------|
| <b>Command Module Firmware:</b>                              | None |
| <b>Command Module Firmware Rev:</b>                          | None |
| <b>I-SCPI Win 3.1:</b>                                       | No   |
| <b>I-SCPI Series 700:</b>                                    | No   |
| <b>C-SCPI LynxOS:</b>                                        | No   |
| <b>C-SCPI Series 700:</b>                                    | No   |
| <b>Agilent VEE Drivers:</b>                                  | No   |
| <b>VXI <i>plug&amp;play</i> Windows® Framework:</b>          | No   |
| <b>VXI <i>plug&amp;play</i> MS Windows 95/NT® Framework:</b> | Yes  |
| <b>VXI <i>plug&amp;play</i> HP-UX Framework:</b>             | Yes  |

**VXI Characteristics**

|                           |                                                           |
|---------------------------|-----------------------------------------------------------|
| <b>VXI device type:</b>   | Register-based                                            |
| <b>Data Transfer Bus:</b> | A16, A32 - D32, D16, D08                                  |
| <b>Roles:</b>             | Master, Slave                                             |
| <b>Connectors:</b>        | P1, P2                                                    |
| <b>Shared Memory:</b>     | 4, 8, 32, 64 MB                                           |
| <b>VXI Busses:</b>        | VXIbus<br>Local Bus<br>TTL Trigger Bus<br>ECL Trigger Bus |

**TMS320C40 TIM-40 Module (Option 011)**

|                    |                                                    |
|--------------------|----------------------------------------------------|
| <b>Type:</b>       | TI TMS320C40 (32 bit, floating point)              |
| <b>DSP number:</b> | 1                                                  |
| <b>Clock rate:</b> | 60 MHz                                             |
| <b>Memory:</b>     | 1.5 MB SRAM total<br>(1.0 MB local, 0.5 MB global) |
| <b>Data ports:</b> | Six C40 comm ports, global bus                     |

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**Dual TMS320C44 TIM-40 Module (Option 012)**

|                     |                                                           |
|---------------------|-----------------------------------------------------------|
| <b>Module type:</b> | TIM-40                                                    |
| <b>DSP type:</b>    | TI TMS320C44 (32 bit, floating point)                     |
| <b>DSP number:</b>  | 2                                                         |
| <b>Clock rate:</b>  | 60 MHz                                                    |
| <b>Memory:</b>      | 2 MB SRAM total<br>(0.5 MB local, 0.5 MB global) each DSP |
| <b>Data Ports:</b>  | Four C40 comm ports, global bus                           |

**Four Channel Tuner with DACs (Option 040)**

|                           |                                                                                                     |
|---------------------------|-----------------------------------------------------------------------------------------------------|
| <b>Module type:</b>       | TIM-40                                                                                              |
| <b>DSP type:</b>          | Harris Semiconductor HSP50016<br>(real time digital filtering, decimation<br>and quadrature mixing) |
| <b>DSP number:</b>        | 4                                                                                                   |
| <b>Max input rate:</b>    | 40.96 MB/s (20.48 MSa/s)                                                                            |
| <b>Filter widths:</b>     | 176 kHz - 86 Hz (20.48 MB/s input data rate)                                                        |
| <b>Decimation factor:</b> | 64 - 131,072 (steps of 4)                                                                           |
| <b>Tuning range:</b>      | 0 - 8 MHz, < 1 Hz resolution<br>(20.48 MSa/s input data rate)                                       |
| <b>Data ports:</b>        | Three C40 comm ports<br>(0, 4, 5 jumper selectable), global bus                                     |
| <b>DAC outputs:</b>       | 4                                                                                                   |
| <b>Output level:</b>      | 2.5V p-p (typical)                                                                                  |

## Ordering Information

|                         |                                   |
|-------------------------|-----------------------------------|
| <b>Agilent SCMVX008</b> | TI-based DSP Module               |
| <b>Opt 011</b>          | TMS320C40 TIM-40 Card             |
| <b>Opt 012</b>          | Dual TMS320C44 TIM-40 Card        |
| <b>Opt 040</b>          | Four-Channel Tuner with DACs      |
| <b>Opt 140</b>          | AM, FM, SSB Demodulation Software |
| <b>Opt 082</b>          | 4 MB DRAM VXI Shared Memory       |
| <b>Opt 083</b>          | 8 MB DRAM VXI Shared Memory       |
| <b>Opt 085</b>          | 32 MB DRAM VXI Shared Memory      |
| <b>Opt 086</b>          | 64 MB DRAM VXI Shared Memory      |
| <b>Opt 0B1</b>          | Additional Manual                 |
| <b>SCM04008</b>         | I/O Library                       |
| <b>SCM01545</b>         | Debug Kit                         |
| <b>SCM00010</b>         | C4X Comm Port Cable Kit           |
| <b>SCM00012</b>         | JTAG Chain Cable                  |
| <b>A2636-61601</b>      | RS232 Cable (30 inch)             |

## Warranty

This product is distributed, warranted, and supported by Agilent Technologies. It is manufactured by Spectrum Signal Processing, Inc.

The Agilent SCMVX008 comes with a 1-year warranty. During that period, the unit will either be replaced or repaired, at Agilent's option, and returned to the customer without charge.

## Related Agilent Literature

Agilent E3238S Scanning Signal Analysis  
System Brochure  
p/n 5968-2075E

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