



## Ultra 160 - Technical Update and Available Products

Ultra160 SCSI is the next generation of high performance SCSI technology that offers data transfer speeds of up to 160MB/sec. It describes any device that combines Ultra2 SCSI with Cyclic Redundancy Check<sup>1</sup> (CRC), Domain Validation<sup>2</sup>, and Double Transition Clocking<sup>3</sup>. By incorporating this specific combination of optimized features, Ultra160 SCSI establishes an effective standard for performance and device compatibility.

Ultra 160 is an ideal solution for high performance situations such as workstations, servers, multi-user systems, Storage Area Networks (SANs) and Local Area Networks (LANs).

### CRU Product Matrix that supports Ultra 160

Depending on the application, CRU offers various solutions to meet your requirements.

#### **External Drive Enclosures without a removable cartridge**

All CRU 1, 2, 4 and 7 bay external enclosures that are compatible with Ultra2 SCSI are compatible with Ultra160 SCSI. They are equipped with a high quality twist and flat ribbon cable and a LVD/SE dual mode terminator. Thus, ensuring compliance with the

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<sup>1</sup> Ultra160 devices utilize Cyclic Redundancy Check which is code similar to a checksum. Each data transfer cycle includes this data and the receiving SCSI device decodes this information to verify that the data was transferred correctly.

<sup>2</sup> Domain Validation uses a sequence of I/O commands to determine the optimum transfer rate between the SCSI card and the SCSI device. This method limits the bandwidth to the interfacing device to help insure a reliable data transfer.

<sup>3</sup> Double Transition Clocking, also called dual edge clocking, uses both the leading edge and trailing edge of the data request line that clocks the data. With Double Transition Clocking, the data lines move up to the fundamental frequency while the fundamental frequency of the cable remains the same. When Double Transition Clocking is combined with LVD signaling, Ultra2 SCSI physical layer requirements are obtainable for Ultra 160. Therefore, cables, cable lengths, connectors, connector spacing, terminations, back planes, peripheral devices, etc. remain the same for Ultra 160 and Ultra2. Double Transition Clocking is only used for Data input and output phases, while the other transfer phases use asynchronous transmission.

Ultra 160 specifications.

<b>Part Number</b>	<b>Description</b>
9-1005-01	1 Bay Enclosure, Ultra2 SCSI / LVD, Distribution Kit
9-2005-01	2 Bay Enclosure, Ultra2 SCSI / LVD, Distribution Kit
8-4030-01	4 Bay Enclosure, Ultra2 SCSI / LVD, Distribution Kit.
9-7130-02	7 Bay Enclosure, Ultra2 SCSI / LVD, Distribution Kit.

### Removable Single drive DataPorts

All of the CRU DP-V, V plus, VI, VII and VIII that are Ultra2 SCSI compatible will support Ultra160 in a single drive configuration. This means that there can be multiple Ultra 160 SCSI drives on one SCSI bus, but only one Ultra 160 drive can be installed in a DataPort.

<b>DataPort V Ultra Wide SCSI / LVD</b>	
<b>Part Number</b>	<b>Description</b>
9175-141-05	Complete Assembly: SCSI ULTRA WIDE/LVD, Plastic Cartridge, Cast Aluminum Frame, Fan, Key, White
9075-102-05	Cartridge Separate: SCSI ULTRA WIDE/LVD, Plastic Cartridge, Key, White
9075-102-06	Cartridge Separate: SCSI ULTRA WIDE/LVD, Plastic Cartridge, Latch, White
9085-135-01	Frame Separate: SCSI ULTRA WIDE/LVD, Cast Aluminum Frame, Fan
<b>DataPort V Plus Ultra Wide SCSI / LVD</b>	
9275-145-01	Complete Assembly: SCSI ULTRA WIDE/LVD, Cast Aluminum Cartridge, Cast Aluminum Frame, Fan, Key, White
9085-102-01	Cartridge Separate: SCSI ULTRA WIDE/LVD, Cast Aluminum Cartridge, Key, White
9085-102-02	Cartridge Separate: SCSI ULTRA WIDE/LVD, Cast Aluminum Cartridge, Latch, White
9085-135-01	Frame Separate: SCSI ULTRA WIDE/LVD, Cast Aluminum Frame, Fan
<b>DataPort V Plus Ultra Wide SCSI / LVD, 142mm</b>	
9275-745-01	142 mm Complete Assembly: SCSI ULTRA WIDE/LVD, Cast Aluminum Cartridge, Cast Aluminum Frame, Fan, Key, White
9085-745-01	142 mm Cartridge Separate: SCSI ULTRA WIDE/LVD, Cast Aluminum Cartridge, Key, White
9085-135-01	Frame Separate: SCSI ULTRA WIDE/LVD, Cast Aluminum Frame, Fan
<b>DataPort VI Ultra Wide SCSI / LVD</b>	
9276-145-01	Complete Assembly: SCSI ULTRA WIDE/LVD, Cast Aluminum Cartridge, 7 Segment SCSI ID Display, Cast Aluminum Frame, Fan, Fan Failure Alarm, Key, White
9086-102-01	Cartridge Separate: SCSI ULTRA WIDE/LVD, Cast Aluminum Cartridge, 7 Segment SCSI ID Display, Key, White
9086-103-01	Cartridge Separate: SCSI ULTRA WIDE/LVD, Cast Aluminum Cartridge, 7 Segment SCSI ID Display, Latch, White
9086-135-01	Frame Separate: SCSI ULTRA WIDE/LVD, Cast Aluminum Frame, Fan, Fan Failure Alarm

<i>DataPort VI Ultra Wide SCSI / LVD, Black</i>	
9276-145-05	Complete Assembly: SCSI ULTRA WIDE/LVD, Cast Aluminum Cartridge, 7 Segment SCSI ID Display, Cast Aluminum Frame, Fan, Fan Failure Alarm, Key, Black
9086-102-05	Cartridge Separate: SCSI ULTRA WIDE/LVD, Cast Aluminum Cartridge, 7 Segment SCSI ID Display, Key, Black
<b>DataPort VI Ultra Wide SCSI / LVD SCA 80 Pin</b>	
9286-145-01	Complete Assembly: SCSI ULTRA WIDE/LVD SCA 80 PIN, Cast Aluminum Cartridge, 7 Segment SCSI ID Display, Cast Aluminum Frame, Fan, Fan Failure Alarm, Key, White
9086-801-01	Cartridge Separate: SCSI ULTRA WIDE/LVD SCA 80 PIN, Cast Aluminum Cartridge, 7 Segment SCSI ID Display, Key, White
9086-135-01	Frame Separate: SCSI ULTRA WIDE/LVD SCA 80 PIN, Cast Aluminum Frame, Fan, Fan Failure Alarm
<i>DataPort VI Ultra Wide SCSI / LVD SCA 80 Pin, Black</i>	
9286-145-05	Complete Assembly: SCSI ULTRA WIDE/LVD SCA 80 PIN, Cast Aluminum Cartridge, 7 Segment SCSI ID Display, Cast Aluminum Frame, Fan, Fan Failure Alarm, Key, Black
9086-801-05	Cartridge Separate: SCSI ULTRA WIDE/LVD SCA 80 PIN, Cast Aluminum Cartridge, 7 Segment SCSI ID Display, Key, Black
<b>DataPort VII Ultra Wide SCSI / LVD</b>	
9370-641-01	Complete Assembly: SCSI ULTRA WIDE/LVD, Cast Aluminum Cartridge, Cast Aluminum Frame, 7 Segment SCSI ID Display, Fan, Fan Failure Alarm, Key, White
9091-601-01	Cartridge Separate: SCSI ULTRA WIDE/LVD, Cast Aluminum Cartridge, White
9092-641-01	Frame Separate: SCSI ULTRA WIDE/LVD, Cast Aluminum Frame, 7 Segment SCSI ID Display, Fan, Fan Failure Alarm, Key
<b>DataPort VIII Ultra Wide SCSI / LVD</b>	
9470-145-01	Complete Assembly: SCSI Ultra Wide/LVD, cast aluminum cartridge, cast aluminum frame, LCD display, dual fans, fan failure alarm, key, white
<i>DataPort VIII Ultra Wide SCSI / LVD, Black</i>	
9470-145-05	Complete Assembly: SCSI Ultra Wide/LVD, cast aluminum cartridge, cast aluminum frame, LCD display, dual fans, fan failure alarm, key, Black

### **Multiple removable drive configuration**

CRU offers two product lines that support Ultra160 SCSI in a multiple disk storage system, either RAID or JBOD. Both are equipped with the removable drive feature. Both solutions utilize the 80-pin SCA (Single Connector Attachment) SCSI drive only.

DAE-800 and 4-Bay sub-system configured with SCA cartridges are the “off the shelf” solutions currently available from CRU. DAE-800 RAID Ready Enclosure can be configured in either stand-up tower or 19-inch Rackmount and will hold up to eight drives. The compact 4-Bay sub-system is an ideal solution for an entry-level server or a workstation RAID solution.

<b>4-Bay Sub System with DataPort VI SCA cartridges</b>	
<b>Part Number</b>	<b>Description</b>
9-4201-02	4 Bay Enclosure with Backplane and four DataPort VI Ultra Wide SCSI 80-pin SCA cartridges.
<b>DAE-800 RAID Ready Enclosure with DataPort VI SCA</b>	
8-8507-08	8 Bay Tower with Backplane and 8 Integrated DataPort VI SCA Cartridges, White
8-8507-58	8 Bay Tower with Backplane and 8 Integrated DataPort VI SCA Cartridges, Black
8-8517-08	8 Bay Rackmount with Backplane and 8 Integrated DataPort VI SCA Cartridges, White
8-8517-58	8 Bay Rackmount with Backplane and 8 Integrated DataPort VI SCA Cartridges, Black

The 3 by 2 RAID enclosure is another Ultra160 solution provided by CRU. This new space saving design accommodates three low profile (1 inch high) 80-pin SCA hard drives in one full-height, or two half-height, drive bays. Multiple units can be daisy-chained to expand the number of disk drives per SCSI channel.

<b>Three drives in Two Bay SCA Hard Disk Enclosure</b>	
<b>Part Number</b>	<b>Description</b>
N/A	3 x 1" height SCA hard drive enclosure.

System integrators and OEMs can custom build Ultra160 SCSI disk array using the CRU DataPort VI SCA cartridge and any of the listed 2, 3 and 4 bay backplanes. Also, the integrated 3 bay system, 3 by 2, can be used.

<b>2, 3 and 4 Bay Backplanes</b>	
<b>Part Number</b>	<b>Description</b>
7600-268-02	2-Bay Backplane for Ultra Wide SCSI / LVD
7600-368-02	3-Bay Backplane for Ultra Wide SCSI / LVD
7600-468-02	4-Bay Backplane for Ultra Wide SCSI / LVD
9086-801-01	Cartridge Separate: SCSI ULTRA WIDE/LVD SCA 80 PIN, Cast Aluminum Cartridge, 7 Segment SCSI ID Display, Key, White
9086-801-05	Cartridge Separate: SCSI ULTRA WIDE/LVD SCA 80 PIN, Cast Aluminum Cartridge, 7 Segment SCSI ID Display, Key, Black
SSC-CBL-INTU205	Internal Twist/Flat cable, 68-pin Male to Male, 5" (Patch cable between backplanes)
SSC-CBL-INTU210	Internal Twist/Flat cable, 68-pin Male to Female, 10" (For connecting backplane to external SCSI cable)
SSC-CBL-INTU220	Internal Twist/Flat cable, 68-pin Male to Female, 20" (For connecting backplane to external SCSI cable)

## **Frequently Asked Questions about CRU's Ultra160 SCSI solutions**

**Q: Is Ultra160 SCSI better than Fiber Channel?**

Ultra160 SCSI offers definite advantages over Fiber Channel. To begin with, Ultra160 SCSI is 60% faster than Fiber Channel, which operates at a maximum speed of only 100 Mbytes/sec. Because SCSI has enjoyed much broader use, it also offers a wider array of devices from which to choose. This serves to keep costs down and make Ultra160 SCSI less expensive to implement. Compatibility is also at issue. While it is unquestionably one of SCSI's strengths, the history of Fiber Channel has demonstrated that compatibility between different products and versions can be a significant problem.

**Q: What is SCA (Single Connector Attachment) interface and what does it look like?**

The SCA interface was designed to provide a standard connection for systems using hot swappable drives. SCA interface drives connect to a SCSI backplane that provides power, configuration settings such as SCSI ID, and termination of the SCSI bus. Figure below shows an 80-pin SCA connector typically found on the back of a SCA hard drive.

**Q: What type of internal SCSI cable should I use?**

CRU recommends the Twist-N-Flat ribbon cable for Ultra160 applications. The twisted pairs significantly reduce cross talk on the data lines, suitable for the high frequency application.

**Q: What are the differences between the SCA cartridge/backplane and the SI-121C solution.**

The SCA cartridge with back plane provides better drive protection and security. The metal DataPort cartridge dissipates drive heat better and the robust DIN connector protects drive from possible failure due to frequent insertions and extractions. The cartridge can hold high profile, 1.6" height drives. The 3 by 2 can only use low profile drives. On the other hand, 3 by 2 can pack more drives per drive bay, making it ideal for applications with limited space.

**Q: Is there a solution for the 68-pin Ultra160 drives?**

CRU is currently working on the 68-pin Ultra160 solution. Please keep a check on our website for product update information.