Integrated Testing Equipment for Set Top Boxes

The task of testing diagnostic ports for set top cable boxes – devices that connect to a television and an external signal, turning the signal into content displayed on a television screen - is a crucial step in the manufacturing process for most cable companies.

Each set top box contains a testing diagnostic port, which is used to diagnose a problem if a failure occurs. After a set top box is manufactured, it undergoes a series of tests, one of which includes testing to ensure the diagnostic port is working properly before it is distributed to users.

To ensure that the appropriate testing was being performed with the utmost accuracy, a very large cable company partnered with a leading electronic testing service company to custom-build 85 electronic test systems. The testing system that was developed allowed for 12 set top boxes to be tested at a time. In creating this system, the electronic testing company needed a product that had both scalability and flexibility. Comtrol’s DeviceMaster serial hub was able to provide both of these qualities for the customized testing system. Two DeviceMaster serial hubs were placed into each test system. The first DeviceMaster was connected to 12 set top boxes, and the second DeviceMaster product connected multiple display monitors through video switches.

During the testing phase, a tester sends a command through the central server to Comtrol’s DeviceMaster product. The DeviceMaster relays the diagnostic test message to each of the 12 set top boxes, gathering the response data from each box. All this information is then passed back to the server through the DeviceMaster. The second DeviceMaster is connected to video switches, which are used to control multiple display monitors. The display monitors allow the tester to view different formats of diagnostic information that each set top box provides based on the command they were given. As the monitors display the appropriate information during the diagnostic testing, each set top box will pass this portion of the testing phase with complete accuracy.

In the end, the scalability and flexibility of Comtrol’s DeviceMaster product allowed the electronic testing company to provide the perfect solution of a flexible and responsive diagnostic test system for their customer.

To learn more about Comtrol’s DeviceMaster® products, visit www.comtrol.com.

Continued on back
DEVICEMASTER SERIAL HUB SPECIFICATIONS

**HARDWARE**
- Bus Interface Specification: 10/100 BASE-T
- Memory: SDRAM 8 MB, Flash 4 MB
- Enclosure: Black Finished Steel
- Installation Method: Panel Mountable
- LED Indicators: 100MB Ethernet, Collision, Ethernet Link/Activity, RX/TX per port, and Status
- Enclosure Dimensions: 10.8” x 6.3” x 1.8”
- Product Weight: 77.1 oz

**ELECTRICAL SPECIFICATIONS**
- **Device**
  - DC Input Voltage: 9-30VDC
  - Current Consumption at +24 VDC: 132mA
  - Power Consumption (max): 3.2W
- **Control External Power Supply**
  - Output Voltage: 9-30VDC
  - Output Current: +24VDC 500mA
  - Line Frequency: 47.63 Hz
  - Line Voltage: 90-264 VAC
- **ESD Surge Protection**
  - Provides minimum of 15KV for all serial lines, all Ethernet components are rated to 1.5KV magnetic surge protection

**ENVIRONMENTAL SPECIFICATIONS**
- **Air Temperature**
  - System On: -37° to 74°C
  - System Off: -40° to 85°C
- **Operating Humidity**
  - (Non-Condensing): 5% to 95%
- **Altitude**
  - 0 to 10,000 Feet
- **Heat Output**
  - 10.9 BTU/Hr
- **MTBF** (Mean Time Between Failures): 24.0 Years

**SERIAL COMMUNICATIONS**
- **Connector Type**: DB9M
- **Number of Ports**: 8
- **Supported Interfaces**: RS-232
- **Baud Rates**: 300 to 230.4Kbps
- **Receive Buffer**: 1024 bytes
- **Transmit Buffer**: 256 bytes
- **Device Driver Data Control**
  - Data Bits: 7 or 8
  - Parity: odd, even, or none
  - Stop Bits: 1 or 2
- **Flow Control**: Hardware, Software, None

**ETHERNET SPECIFICATIONS**
- **Network Protocols**: ARP, BOOTP, DHCP, HTTP, ICMP, Rarp, RFC 1006 (ISO over TCP), RFC 2217, SNMP (MIB-II), TCP/ IP & UDP socket services, Telnet, TFTP Supports IP multicast data transmission

**EXPORT INFORMATION**
- **Package Shipping Weight**: 74.6 lbs
- **Package Dimensions**: 19.63” x 4” x 14”
- **UPC Code**: 7-56727-99465-7
- **Country of Origin**: USA
- **Schedule B Number**: 8471.80.1000

**DEVICE DRIVERS**
- Microsoft® Windows® NT® 4.0
- Microsoft® Windows® Server® 2003
- Microsoft® Windows® 2000
- Microsoft® Windows® XP
- Microsoft® Windows® 7
- Microsoft® Windows® 2008 Server
- Microsoft® Windows® Vista

**FEATURES**
- SNMP Support: Monitoring Only
- Event Notification and Watchdog
- Manufacturer’s Warranty: 5 Years

**REGULATORY STANDARDS**
- **Emissions**
  - CANADIAN EMC REQUIREMENTS
  - ICES-003
  - European Standard EN55022
  - FCC PART 15 SUBPART B
  - CLASS A LIMIT
  - CISPR 22
- **Immunity**
  - European Standard EN55024
  - IEC 1000-4-2/EN61000-4-2: ESD
  - IEC 1000-4-3/EN61000-4-3: RF
  - IEC 1000-4-4/EN61000-4-4: Fast Transient
  - IEC 1000-4-5/EN61000-4-5: Surge
  - IEC 1000-4-6/EN61000-4-6: Conducted Disturbance
  - IEC 1000-4-8/EN61000-4-8: Magnetic Field
  - IEC 1000-4-11/EN61000-4-11: Dips and Voltage Variations
- **Safety**
  - IEC 60950/EN60950 (Recognized)
  - CSA C22.2 No. 60950/UL60950 Third Edition

**ORDERING INFORMATION**
99465-7 DeviceMaster 8-Port Serial Hub

**PRODUCT SUPPORT & SERVICE INFORMATION**
- Warranty Information: Comtrol offers a 30-day satisfaction guarantee and 5-year limited warranty.
- Sales Support: +1.763.957.6000
- Technical Support: +1.763.957.6000
- Email, FTP, and Web Support:
  - info@comtrol.com
  - ftp.comtrol.com
  - www.comtrol.com

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