DILOG

Model DQ212

SMD INTERFACE COMPATIBLE DISC CONTROLLER

DEC LSI-11 COMPATIBLE

FEATURES

- **Interfaces LSI-11, 11/2, and 11/23 computers to any two SMD flat cable interface compatible hard disc drives with capacities from 8 to 160 megabytes.**
- **Cost effective for 8″ Winchester yet allows larger 14″ Winchester, SMD pack or CMD cartridge type drives to be used without changing controllers.**
- **Runs DEC RP02/RP03 software drivers.**
- **Low cost microprocessor based intelligent controller is completely contained on one quad printed circuit module.**
- **Up to 60% less power consumption than other similar controllers.**
- **Contains an expanded error correction code (ECC). Utilizing a 56-bit checkword, plus bad-sector flagging and transparent, automatic, track-skipping features.**
- **Automatic power down data protection.**
- **Full sector data buffer for elimination of data late errors due to DMA latency.**
- **On-board bootstrap loader for RP02/RP03, RK06/RK07, RX02, RK05, RL01/RL02 and TM-11 support, with jumper selectable bootstrap address.**
- **Automatic self test mode with built in micro-diagnostics and a data protect feature.**
- **Multiple sector transfers across track boundaries to 64K words.**
- **Memory addressing to 128K words.**

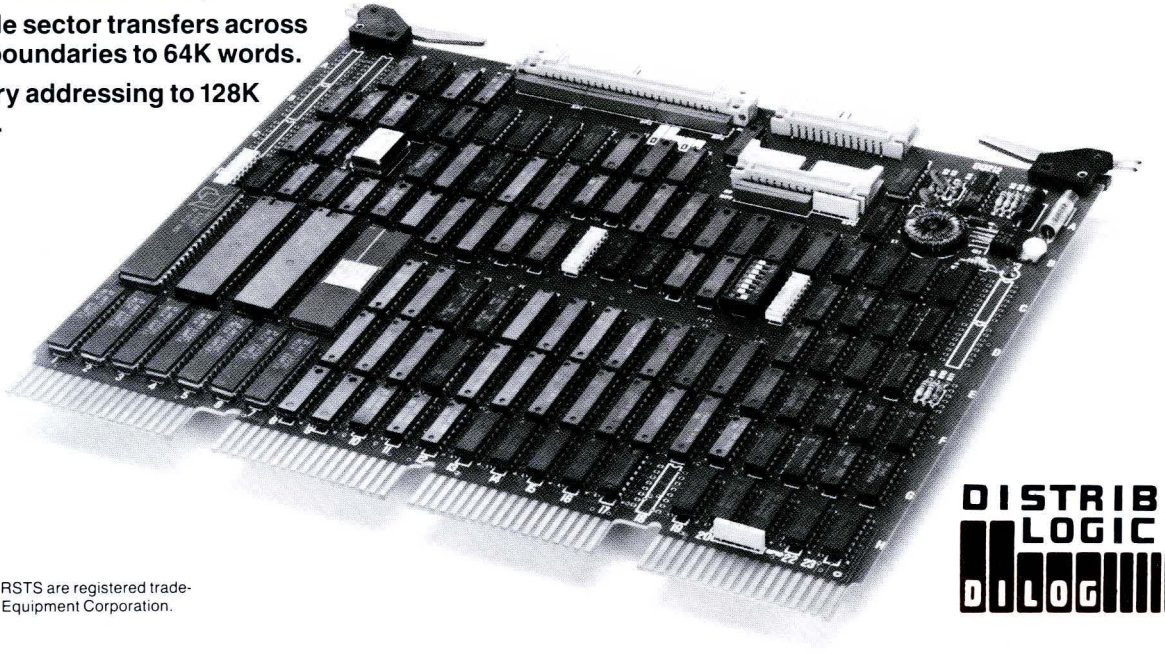
DESCRIPTION

The Distributed Logic Corporation (DILOG) Model DQ212 Disc Controller allows the user to mix-or-match up to two each 8″ and/or 14″ Winchester, SMD pack or cartridge type disc drives *without changing the controller or components on the controller.* The Model DQ212 emulates DEC RP02/RP03 software drivers in RT-11, RSX-11 and RSTS operating systems.

An expanded 56-bit error correction code (ECC) has been incorporated in the DQ212 for detecting and correcting data errors from the disc drive. This is in addition to the media flaw compensation features used on all DILOG disc controllers.

A complete disc subsystem is comprised of the controller, one or two disc drives, and the necessary interconnecting ribbon cables.

No specially wired connectors, additional chassis, power supplies or bus converters are required. The single quad printed circuit module contains all necessary disc controller interface and formatting circuitry.



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DISC DRIVE COMPATIBILITY

The Model DQ212 can interface up to two SMD interface compatible drives having up to 300 megabytes of unformatted capacity each. Two drives with the same or different characteristics and/or types (Winchester, SMD pack, or CMD cartridge) may be handled by the same controller. This includes mixing 8″ or 14″ Winchester, SMD pack, or CMD cartridge type drives.

MEDIA FLAW COMPENSATION

Incorporated in the DQ212 are three features used to compensate for data errors whether they are caused by media flaws, minor drive misalignment or weak components in the drive (i.e. soft servo system). First the DQ212 flags bad sectors on the disc and assigns alternate tracks when formatting. Second an automatic read retry is incorporated once the pack is formatted. This feature compensates for soft errors that can occur due to marginal components. Read retries will compensate for soft errors that can occur due to marginal drive components. Third, an expanded 56-bit ECC Polynomial is used for detecting and/or correcting single or double burst errors, which are greatly reduced when compared with the commonly used 32-bit Polynomial. These features are transparent to the RT-11, RSX-11 & RSTS operating systems.

HARDWARE BOOTSTRAP

The Model DQ212 contains an on-board bootstrap loader for RP02/RP03, RK06/RK07, RX02, RK05, RL01/RL02 and TM-11 mag tape support. On-board jumpers allow selectable bootstrap addresses, in addition to enabling/disabling the bootstrap. When the bootstrap is disabled, the Model DQ212 will boot from the standard DEC REV-11 Module.

SOFTWARE SUPPORT

The Model DQ212 is transparent to the RP02/RP03 drivers contained in the various DEC operating systems, such as RT-11, RSX-11 and RSTS. A format/diagnostic routine is supplied with each unit.

DATA FORMAT MAPPING

The Model DQ212 allows the various types of physical drives with which it is compatible to be mapped into up to 8 logical units. Logical unit size may vary with drive capacity and type.

MICROPROCESSOR BASED

The heart of the Model DQ212 is a proprietary, high speed, bipolar microprocessor configuration. The majority of controller functions are implemented in firmware. This allows a parts count significantly reduced from conventional controllers. User benefits include reduced size, increased controller reliability and applications flexibility.

AUTOMATIC SELF TEST

The Model DQ212 is supplied with an automatic self test feature which causes on-board microdiagnostics to be run on the controller each time the Q-Bus is initialized. A green card-edge LED indicator is lit and remains lit after each successful completion of the microdiagnostics. Should the microdiagnostics fail, the LED indicator is extinguished and a data protect feature is invoked which disallows any communications between the CPU and the disc, thus protecting critical data base areas from the overwriting of erroneous information.

MODE CONTROL SWITCHES

Model DQ212 contains on-board jumpers and switches for selection of starting bootstrap address, bootstrap enable/disable and disc mapping control. Device address selection is jumper selectable.

LOW POWER CONSUMPTION

With its single board architecture and extensive use of Low Power Schottky circuitry, the Model DQ212 exhibits up to 60% less power consumption than other DEC compatible SMD type disc controllers.

FULL SYSTEMS SUPPORT

Distributed Logic Corporation also supplies fully integrated and tested disc subsystems including the disc drives themselves. For the customer that wishes to purchase drives directly from the manufacturer they can be drop shipped to DILOG where they will be integrated, tested and shipped as a complete system with the Model DQ212.

DOCUMENTATION

Each Model DQ212 is supplied with an Instruction Manual.

OPTIONS

Disc drive I/O cables • Disc drives • Factory integration of customer-supplied drives.

DISC DRIVES SUPPORTED

The Model DQ212 will interface to industry standard SMD flat cable interface compatible disc drives including manufacturers and drive types as follows:

CDC—SMD/CMD/MMD/LARK
CENTURY DATA—TRIDENT SMD—MARKSMAN
BALL COMPUTER PRODUCTS—SMD
AMPEX—SMD/WINCHESTER/CMD
FUJITSU—WINCHESTER
MITSUBISHI—SMD/WINCHESTER
SLI INDUSTRIES
KENNEDY—WINCHESTER
OKIDATA—WINCHESTER
PRIAM—WINCHESTER
BASF—WINCHESTER

Rotational Rates—to 3,600 rpm
Unformatted Capacities—to 300 megabytes

CONTROLLER SPECIFICATIONS

Mechanical—The Model DQ212 is completely contained on one quad module 10.44 inches wide by 8.88 inches deep, and plugs into and requires one slot in any DEC LSI-11 based system quad backplane.

Computer I/O

Register Addresses (PROM selectable)
Factory set at:
—Device Status Register (RPDS) 776 710
—Error Register (RPER) 776 712
—Control Status Register (RPCS) 776 714
—Word Count (RPWC) 776 716
—Bus Address (RPBA) 776 720
—Cylinder Address (RPCA) 776 722
—Disk Address (RPDA) 776 724
—Silo Memory (SILO) 776 726

Data Transfer
—Method: DMA
—Maximum block size transferred in a single operation is 64K words.

Bus Load
—1 std unit load

Address Ranges
—Disc drive: up to 240 megabytes total
—Computer memory: to 128K words

Interrupt Vector Address
—PROM selectable (factory set at 254, priority level BR5)

Disc Drive I/O Connector—one 60 pin type "A" flat ribbon cable mounted on outer edge of controller module. Two 26 pin type "B" ribbon cable (1 for each drive interfaced with).

Signal—SMD A/B flat cable compatible

Power— + 5 volts at 3.5 amps, + 12 volts at 300 milliamps from computer power supply.

Environment—Operating temperature 40°F. to 140°F., humidity 10 to 95% non-condensing.

Shipping Weight—5 pounds, includes documentation and cables.

†Specifications subject to change without notice.

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