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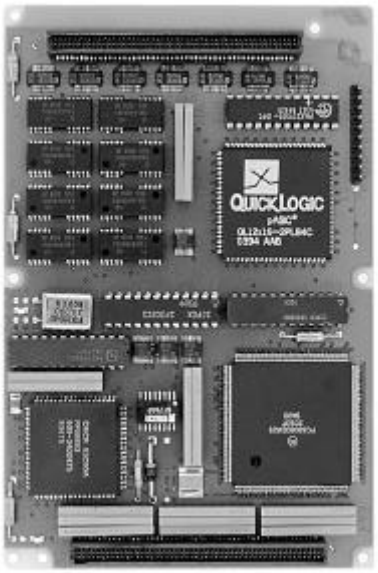
Find the *Curtiss-Wright / DY-4 MAX-220* at our website: *Click HERE*

MAX-220

Ethernet/SCSI/Serial/Parallel MAXPack

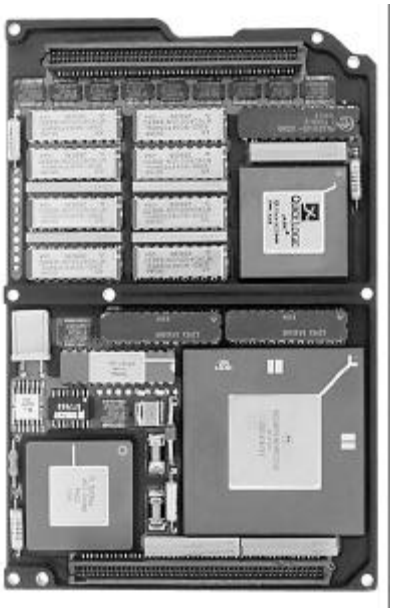
Features

- *Mezzanine board supporting MAXPack slave interface*
- *22.5 MHz 68EN360 processor*
- *Ethernet™ LAN interface*
- *SCSI II controller, 8-bit single-ended*
- *Up to 4 serial ports, configurable interfaces and clocking options*
  - *2 synchronous EIA-422/232*
  - *4 asynchronous EIA-232/422*
  - *Combinations of above*
- *Bi-directional TTL parallel port*
- *CS220 firmware package supporting all available hardware interfaces*
- *4M bytes of dual-ported DRAM*
- *Conduction cooled for MIL-E-5400, MIL-E-4158, and MIL-STD-2036*
- *Optional levels of ruggedization available*



Description

The MAX-220 MAXPack is a mezzanine module which provides Ethernet, SCSI, serial and parallel interfaces. It is an intelligent module based on the Motorola 68EN360 processor. The power of this processor off-loads I/O handling duties from the host processor. Figure 1 shows a block diagram of the MAX-220. MAXPack modules are supported by DY 4's latest generation of Single Board Computers such as the SVME/DMV-162, SVME/DMV-163 and the SVME/DMV-170. The MAX-220 is available in versions to mate with either air-cooled or conduction-cooled base boards. The compact size of the MAXPack design allows considerable I/O capability to be added to fully functional single board computers, thus increasing the packaging density available to the system integrator.



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Processor and Memory

The MAX-220 is based on the 68EN360 QUad Integrated Communication Controller (QUICC™). This device is a member of Motorola's M68300 family of peripheral controllers. The 68EN360 is a highly integrated device which mates a 68020 core with a large number of I/O sub-processors. On the MAX-220, the 68EN360 provides the Ethernet, serial, and parallel interfaces. The 68EN360 operates at 22.5 MHz, and is equipped with 4M bytes of local DRAM. The DRAM and 68EN360 registers are accessible from the base board. The executable code operating on the MAX-220 is uploaded by the host CPU.

SCSI Interface

The MAX-220 provides a single-ended, 8-bit wide SCSI-2 compliant interface. The DMA controller within the 68EN360 is used to transfer data between the local memory and the SCSI controller IC. This allows both the 68EN360 and the host processor to continue to handle processing tasks while data is being transferred to the SCSI bus.

Serial Interfaces

The MAX-220 provides serial ports which may be selected by software to operate with either EIA-232 or EIA-422 interfaces. Synchronous communications are supported at rates up to 1M bps, asynchronous communications at rates up to 703K bps. The 68EN360 supports NRZ, NRZI data formats as well as self-clocking formats such as FM0, FM1 and Manchester encoding. The MAX-220 supports a number of signal allocation configurations, all of which are selected under software control. Two to four serial ports are available, depending on the selected electrical interface. Table 1 provides details of the different serial I/O configurations.

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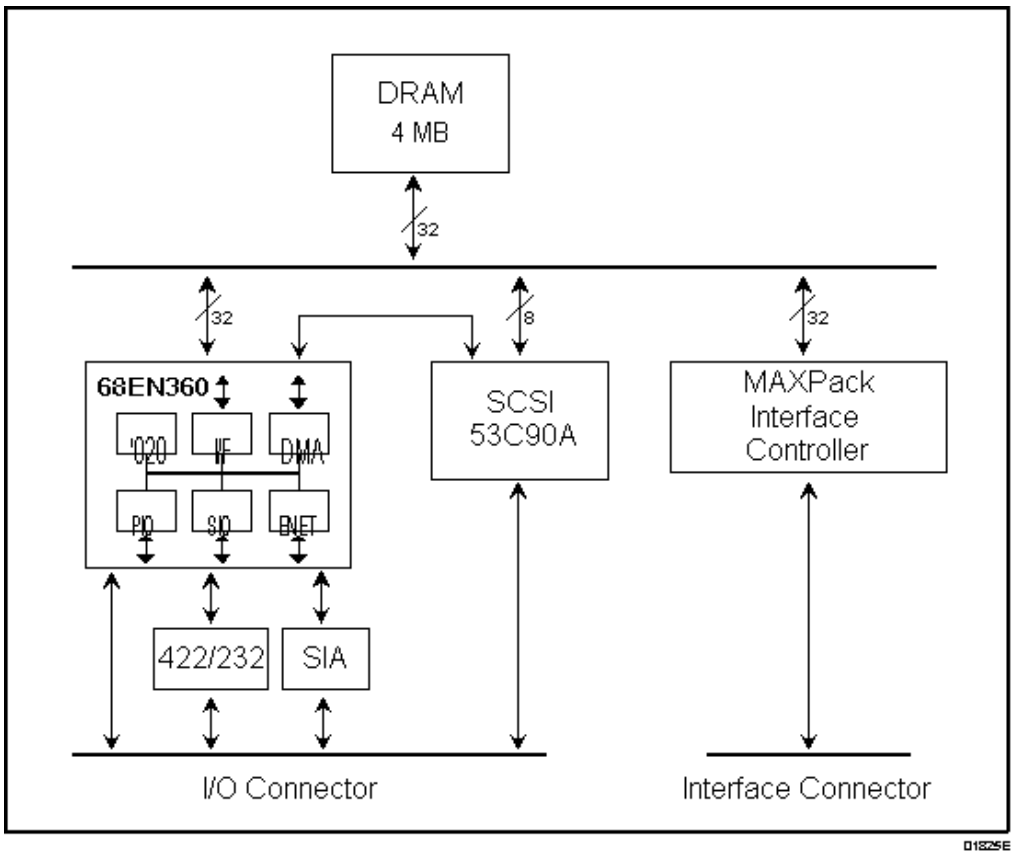


Figure 1: MAX-220 Block Diagram

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Table 1
MAX-220 Serial Port Configurations

	Channel Configuration Options					
Channel	**A**	**B**	**C**	**D**	**E**	**F**
1	TXD	TXD	TXD	TXD	TXD	TXD
1	RXD	RXD	RXD	RXD	RXD	RXD
1	TXC	TXC	TXC	TXC	TXC	
1	RXC	RXC	RXC	RXC	RXC	
2	TXD		TXD			TXD
2	RXD		RXD			RXD
3	TXD	TXD			TXD	TXD
3	RXD	RXD			RXD	RXD
3	RTS	RTS				
3	CTS	CTS				
4	TXD	TXD	TXD	TXD	TXD	TXD
4	RXD	RXD	RXD	RXD	RXD	RXD
4	RTS	TXC	RTS	TXC		
4	CTS	RXC	CTS	RXC		
4	TXC		TXC			
4	RXC		RXC			

Notes:

1. This table shows six possible configurations for the serial I/O. The differences are in the available signals and the electrical interface of the signals. Shaded entries indicate an EIA-422 interface, non-shaded entries indicate an EIA-232 interface.
2. In cases where TXC and RXC signals are shown, an RTS signal may be substituted for TXC, and/or CTS for RXC, except where all four signals are already available.
3. Channel 2 supports asynchronous communications only.
4. EIA-422 channels may operate up to 1M bps, EIA-232 channels may operate up to 200k bps
5. Synchronous operation is supported at rates up to 1M bps, asynchronous operation is supported up to 703K bps.

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Ethernet Interface

The MAX-220 is equipped with an Ethernet™ LAN interface at the three-pair AUI level. The Ethernet function is handled by the 68EN360 processor, which is also used to perform LAN protocol processing, relieving the host CPU of this burden. The LAN address is software programmable.

Parallel Interface

The MAX-220 has a bi-directional parallel port providing 14 bits of I/O. The user has the option of treating the port as 14 bits of discrete I/O or using the port as an 8-bit parallel port with hardware handshaking. In the discrete I/O case each bit may be written and read directly. The parallel port provides TTL level signals, with on-board 10K pull-up resistors.

Supported Firmware

The MAX-220 has available the following firmware:

- MAX-220 Communication Suite (CS220) - provides synchronous and asynchronous serial I/O, TCP/IP on Ethernet, standard SCSI command set, and support for parallel I/O. (refer to CS220, document number MS00215)
- Card Level Diagnostics (CLD) - provides diagnostic routines which perform a self-test function in conjunction with the Built-In-Test equipment (refer to Card Level Diagnostics, document number MS00050)

The firmware is stored in the host SBC's ROM, and is uploaded to the MAX-220 after power-up.

MAXPack Interface

MAXPacks are mezzanine modules which may be fitted to several of DY 4's latest generation Single Board Computers. There are both air-cooled and conduction-cooled versions available. The conduction-cooled models incorporate an aluminum thermal plane which provides structural rigidity, and a good thermal path to the base board. The integrated assembly of base board and MAXPack module meets the same demanding environmental specifications as all other DY 4 conduction-cooled products. The MAXPack interface specification defines the electrical and mechanical elements of the MAXPack design, so that modules such as the MAX-220 can be used on future single board computer products. This will allow the systems integrator to upgrade to higher performance hardware while preserving the software invested in the MAXPack module.

Accessories/Variants

The MAX-220 is available in varying configurations to match the features, performance and ruggedizaton required for the target application. Additional items to assist in software development and system integration are available. The MAX-220 options and accessories consist of:

- P2 I/O cable for development system use
- VxWorks driver for CS-220 firmware package

The SMAX-220 cards are available in ruggedization levels 0 to 3, and the DMAX-220 cards are available in levels 2 and 3.

Note that the 68EN360 is available only as an industrial temperature range device, resulting in a restricted operational temperature range. See Table 2 for environmental specifications.

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Table 2
Specifications

ENVIRONMENTAL SPECIFICATIONS		
Temperature	**(Level 0)**	
Operating	0°C to 50°C	MIL-STD-810
Storage	-40°C to 85°C	Methods 501.3 & 502.3
Temperature	**(Level 1)**	
Operating	-40°C to 85°C	MIL-STD-810
Storage	-40°C to 85°C	Methods 501.3 & 502.3
Temperature	**(Levels 2, 3)**	
†Operating	-55°C to 85°C	MIL-STD-810
Storage	-62°C to 125°C	Methods 501.3 & 502.3
Humidity (DMAX CCA and SMAX CCA - Level 3)		
Operating	0 to 95% non-condensing	MIL-STD-810 Method 507.3
Non-Operating	0 to 100% condensing	
Vibration (DMAX CCA)		
Sine	5g at 15 to 2,000 Hz	MIL-STD-810 Method 514.4
Random	0.1g²/Hz	
Shock (DMAX CCA)		
	40g/11ms half sine	MIL-STD-810 Method 516.4, Proc 1
Altitude (DMAX CCA)		
	21,350m (70,000 ft)	MIL-STD-810 Method 500.3

Weight	**SMAX CCA**	**DMAX CCA**
	<125g (<0.28 lb)	<200g (<0.44 lb)

POWER REQUIREMENTS		
+5v (+5%, -2.5%)	1.0 A (maximum)	0.8 A (typical)
+12v (+5%, -2.5%)	20 mA (maximum)	12 mA (typical)
-12v (+5%, -2.5%)	20 mA (maximum)	12 mA (typical)

† As a general design objective, the junction temperature of all components on the DMAX-220-XXX is limited to 110°C maximum (when the chassis cold-wall temperature is 85°C.) When reliability or performance factors permit, a component's junction temperature may exceed 110°C marginally.

SMAX board operating temperature is based on air flow of 11 cfm.

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