

# NMIS-3020 8CH CURRENT SINK CARD

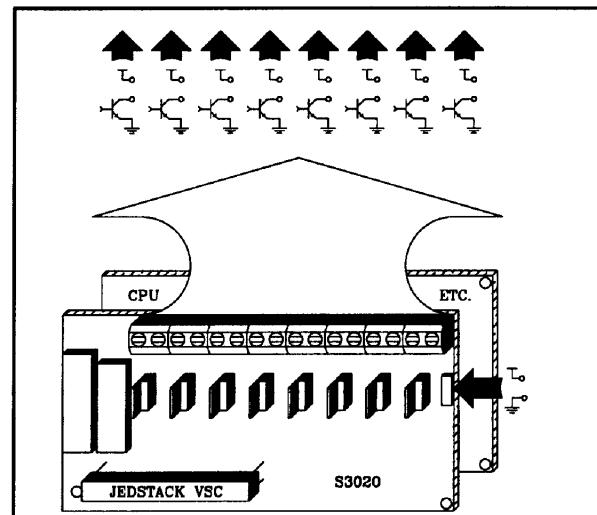
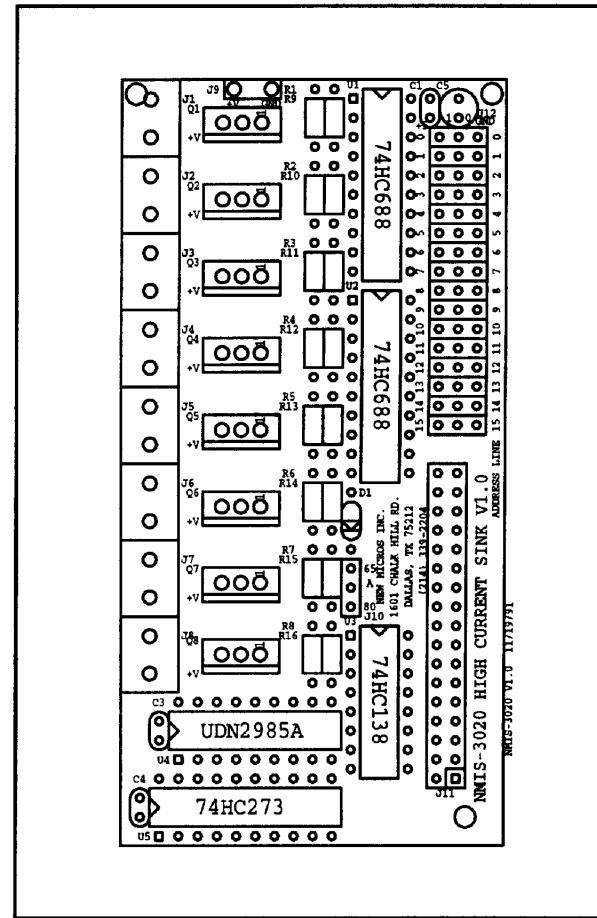
The NMIS-3020 8-Channel High Current Sink Card, in 2x4" s<sup>TM</sup> format, provides a JEDSTACK<sup>TM</sup> computer system with control of 8 sets of High Current Sink Transistors. The outputs are arranged to be easily connected by screw terminal connectors to individual wires.

- 8 TIP101 NPN Darlington transistors
  - High current switching rating:
    - 8-Amps (w/external heat sinks)
    - 80-VDC
  - Commutation diode for inductive load protection
  - Socketed resistors program base current drive
  - Screw terminals for easy connections to loads
  - Terminals for ground and +V connections
  - Latched outputs
  - Power on reset turns all sinks off

Connectors J1 through J8 attach the individual current sinks. TIP101 transistors are provided on the board. Connections are arranged so loads, such as lamps or relays, etc., can be directly wired across the terminals.

An 8-bit latch sets the output states controlling the current sinks. An octal source driver provides the necessary current sourcing and level shift to drive the bases of the high current sink transistors. The source driver is non-inverting, making programming more easily understood. A decoder chip is used to generate the chip select and timing information to operate the 8-bit latch.

A Vertical Stacking Connector in the lower right hand corner (top view) provides connections to the processor's address and data bus, control signals, 5V power and ground. Address decoding of the latch's space in memory is accomplished by two octal comparators and 16 two-position jumpers. Each jumper setting corresponds to the state of a particular address line. The NMIS-3020 occupies a single address location. Any byte location in the 64K address space of the JEDSTACK™ processor's bus can be selected by correct jumper placement.



NMMI S-3020

**NMIS-3020 8CH CURRENT SINK CARD 2x4"s**

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The NMIS-3020 8-Channel High Current Sink Card is designed to stack on the 2x4"™ NMIS Series, the "100 Squared"™ NMIX, and the "Generic Target Computer"™ NMIT Series (with the Vertical Stacking Connector added to the latter) of single board computers. The JEDSTACK™ provides interface signals to the board including address lines, data lines, control lines and 5V power and ground. The fast HC devices allow access times approaching 90nS.

The addressing of the octal latch on the NMIS-3020 is sensed by two 74HC688 (U1 and U2) octal comparators that decode the 16 address lines (A15 - A0) and one control line in order to select only one active location out of a 64K address space. The active address location is user-set by the arrangement of addressing jumpers. Each address line can be sensed for high or low condition.

When the set address is selected by the processor, the 74HC688's generate a chip select to the 74HC138. This signal is also coupled back on the VSC, via the diode, D1, to the MEMDIS' pin. On a write, the 74HC138 strobes an octal latch, 74HC273 (U5). The 74HC273 is connected directly to the Data Bus from which it accepts data from the processor. It, in turn controls an octal source driver, UDN2983A (U4), driving the transistors.

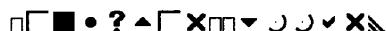
Since the bases in the current sinks are sourced from the +5V supply, there is no inversion between the latch's written data and the state of the current sink. When a zero is written, the current sink transistor is off. The UDN2983A is not sourcing, meaning the transistor can

not sink. When a one is written, the UDN2983A is sourcing, allowing the transistor to sink. (This is the inverse of the “logic” condition sensed by a logic probe at the sink terminal with a pull up to +5V.)

The UDN2983A's outputs can withstand voltages up to 80V. This limits the maximum voltage applied to the sink terminals to 80V which feeds back to the outputs via the base's resistor divider network. Output drive capability of the UDN2983A's, with all drivers on continuously, is 120 mA per driver. This far exceeds the saturation requirements of the transistors.

The TIP101 transistors used for current sinks provide the functionality of the NMIS-3020. They allow switching control of up to 8 Amps at 80 VDC. The supplied current limiting resistor (47 Ohms) in each transistors base leg sets the current from each driver to 80 mA to assure saturation at 8 Amps. With each drawing around 80 mA base drive when activated, when all bases are activated at once, the total current of the board will be about 640 mA. Although most of the circuitry is CMOS, the nature of the high current sinks requires relatively high current operations. Larger resistors can be selected to reduce the drive, and thereby reduce overall requirements on the +5V supply. At 3 Amps the transistor can be saturated with a 6 mA drive (560 Ohms).

ADDRESS	Bit # 7	Bit # 6	Bit # 5	Bit # 4	Bit # 3	Bit # 2	Bit # 1	Bit # 0
XXXX	J8	J7	J6	J5	J4	J3	J2	J1



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