MicroLok® II Non-Vital Input/Output (I/O) PCBs

Non-Vital I/O boards in the MicroLok II product family are designed to handle a broad range of non-vital assignments such as Local Control Panel (LCP) interfacing, input of equipment ground detector and power off indications, output to wayside event recorder, interface to non-vital relays, operation of misc. indicator lamps (e.g. maintainer’s call), interface to TWC systems, etc. Options include 8, 16 and 32-channel sets, isolated or non-isolated circuits and a bi-polar version.

Descriptions

Non-Vital Isolated 32-Output PCB (N17062701)
This board provides 32 isolated, outputs for control of external devices such as indicators and relays. Outputs are divided into two groups of eight outputs and one group of sixteen outputs, each group having a separate bussed common (negative DC) reference output. Isolation allows switching power from sources isolated from the MicroLok II power supply battery. Outputs are designed to operate at battery voltages between 9.5 and 35 Vdc. Outputs switch positive battery and are capable of supplying up to 0.5 amps. The nominal voltage drop per output is load dependent and usually less than 2.5 volts.

The Non-Vital Isolated 32-Output PCB employs PolySwitches to protect the output circuitry. A PolySwitch functions like a circuit breaker. When the over-current trip point (about 0.75 amp) is exceeded, the device switches to high impedance. The PolySwitch returns to low impedance when the overload or short circuit condition is removed. Front panel indicators on this PCB include 32 discrete LEDs in four banks of eight LEDs.

Non-Vital Isolated 32-Input PCB (N17063701)
This MicroLok II PCB system monitors the status of non-vital discrete inputs. Examples include controlled inputs from alarms, sensors and Local Control Panel switches. The PCB provides 32 isolated external inputs. Isolation allows switching power from sources isolated from the MicroLok II power supply. The 32 inputs are divided into two groups of eight inputs and one group of 16 inputs, each group having a separate bussed common (negative DC) reference input. External input voltages between 6 and 35 Vdc represent logical "1." Front panel indicators include 32 LEDs in two banks of 16 LEDs.

Non-Vital Isolated 16-Input PCB-LCP Type (N17002801)
This PCB is designed for use with the optional MicroLok II cardfile Local Control Panel N1700290X (refer to RSE-1D2.11). The board provides 16 isolated external inputs, and is suitable for lighting lamps up to 25W. These inputs each have separate “+” and “-” connections and present a logical "1" when the applied voltage is 6 to 35 Vdc. The board also utilizes Local Control Panel (LCP) N1700290X connected via a 96-pin connector to the front edge of the PCB. The 16 of the inputs are selectable via the front panel LCP pushbuttons. Isolation allows switching power from sources isolated from MicroLok II power supply battery.

Non-Vital 16/8 I/O PCB-LCP Type (N17000601)
This PCB is designed for use with the optional MicroLok II cardfile Local Control Panel N16901301 (refer to RSE-1D2.11). The PCB is fitted with 48-pin connectors on the front and back. The front connector engages the LCP, while remaining PCB I/O (16 Inputs and 8 Outputs) are externally available on the rear connector. Latch ICs are used to buffer inputs and Field Effect Transistors (FETs) to drive outputs. Front panel input/output LEDs are under software control and thus indicate the internal logic state of the inputs/outputs, as opposed to being under the direct
Descriptions (cont’d)

Hardware control of the input/output voltage. Inputs are activated from a positive voltage relative to battery ground over a range of 6 to 30 Vdc. Two outputs (31 and 32) are protected by 5 amp fuses. These output circuits are reserved for control of a relatively high current device. The board may be used with 12V or 24V circuits.

Non-Vital 32/32 I/O PCB (N17061501)
The Non-Vital 32/32 I/O PCB is similar in design to the Non-Vital 16/8 I/O PCB (see above description). The “501” PCB contains 32 input circuits and 32 Output circuits. Each output circuit contains a "low-side" FET transistor switch, which is turned on or off by the I/O Bus. This switch grounds the circuit's load; the other side of which is connected to system battery voltage. All 32 output circuits are identical except for over-current protection. Outputs (1 through 30) employ 0.5A PolySwitches (self-resetting semiconductor devices), to protect the output circuitry, allowing the PCB to drive a variety of loads. A PolySwitch functions like a circuit breaker. When the over-current trip point (about 0.75 amp) is exceeded, the device switches to high impedance. The PolySwitch returns to low impedance when the overload or short circuit condition is removed. The board may be used with 12V or 24V circuits. Front panel LEDs on this board are identical to the “601’ PCB described above.

Bi-Polar Non-Vital Output PCB (N17061801)
This PCB enables the MicroLok II system to drive bipolar outputs such as searchlight signal mechanisms. This board provides 12 independent outputs which change polarity under the control of 24 paired virtual outputs. Alternate assertion of a virtual pair changes the actual output. Two-color LEDs on the board’s front panel are used to indicate when the actual output is on, with green or yellow indicating the polarity. (Yellow indicates normal polarity, and green indicates reverse polarity.) If neither pair is asserted, the output is off and both LEDs are dark. Outputs on this board are protected from accidental connection to B12 or N12. Short circuit protection is also provided. If both virtual outputs of a pair are asserted, an error will be logged in the CPU event memory and the output will remain off.

Advantages

- Allow MicroLok II systems to interface most types of non-vital external devices and circuits.
- Ample number of I/O channels meets most application needs.
- Isolated (house-external circuit) and non-isolated (house-internal circuit) versions available.
- Separate LEDs show states of all channels, including 32-channel versions.
- Bi-Polar version available for bi-polar driver circuits (e.g. searchlight mech.)
- All boards service-proven on railroad and transit properties.
MicroLok® II Non-Vital Input/Output (I/O) PCBs

Specifications

- Refer to ordering tabulations for specifications of each MicroLok II Non-Vital I/O PCB.

Ordering and Additional Information

- Refer to tabulation for Non-Vital I/O PCBs’ part numbers.

- Contact your ASTS USA Account Executive for Non-Vital I/O PCB applications and MicroLok II applications possibilities in general.

- Request ASTS USA Service Manual SM-6800A for additional information.

<table>
<thead>
<tr>
<th>Order No.</th>
<th>Type</th>
<th>Inputs (Max.)</th>
<th>Outputs (Max.)</th>
<th>Voltage</th>
<th>Notes</th>
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</thead>
<tbody>
<tr>
<td>N17061801</td>
<td>Bi-Polar Non-Vital I/O</td>
<td>--</td>
<td>12</td>
<td>9.8-16.2 Vdc</td>
<td>(1)(2)</td>
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<tr>
<td>N17000601</td>
<td>Non-Vital 16/8 I/O - LCP Type</td>
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<td>8</td>
<td>6-30 Vdc</td>
<td>(3)</td>
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<tr>
<td>N17061501</td>
<td>Non-Vital 32/32 I/O</td>
<td>32</td>
<td>32</td>
<td>6-30 Vdc</td>
<td>--</td>
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<tr>
<td>N17002801</td>
<td>Non-Vital Isolated 16-Input</td>
<td>16</td>
<td>--</td>
<td>6.0-35.0 Vdc</td>
<td>(4), (5), (6)</td>
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<tr>
<td>N17062701</td>
<td>Non-Vital Isolated 32-Output</td>
<td>--</td>
<td>32</td>
<td>9.5-35.0 Vdc</td>
<td>(6)</td>
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<tr>
<td>N17063701</td>
<td>Non-Vital Isolated 32-Input</td>
<td>32</td>
<td>--</td>
<td>9.5-35.0 Vdc</td>
<td>(6)</td>
</tr>
</tbody>
</table>

Note (1): Bi-polar outputs (e.g. for searchlight signal mechanism).
Note (2): 250 ohm (nom.) load, poly-switch protected.
Note (3): Used with built-in Local Control Panel N16901301 (see RSE-1D2.11).
Note (4): Externally available; remaining I/O interface to built-in Local Control Panels N17002901 (with key) and N17002902 (without key).
Note (6): Isolation allows switching power from sources isolated from MicroLok II P.S. batt.