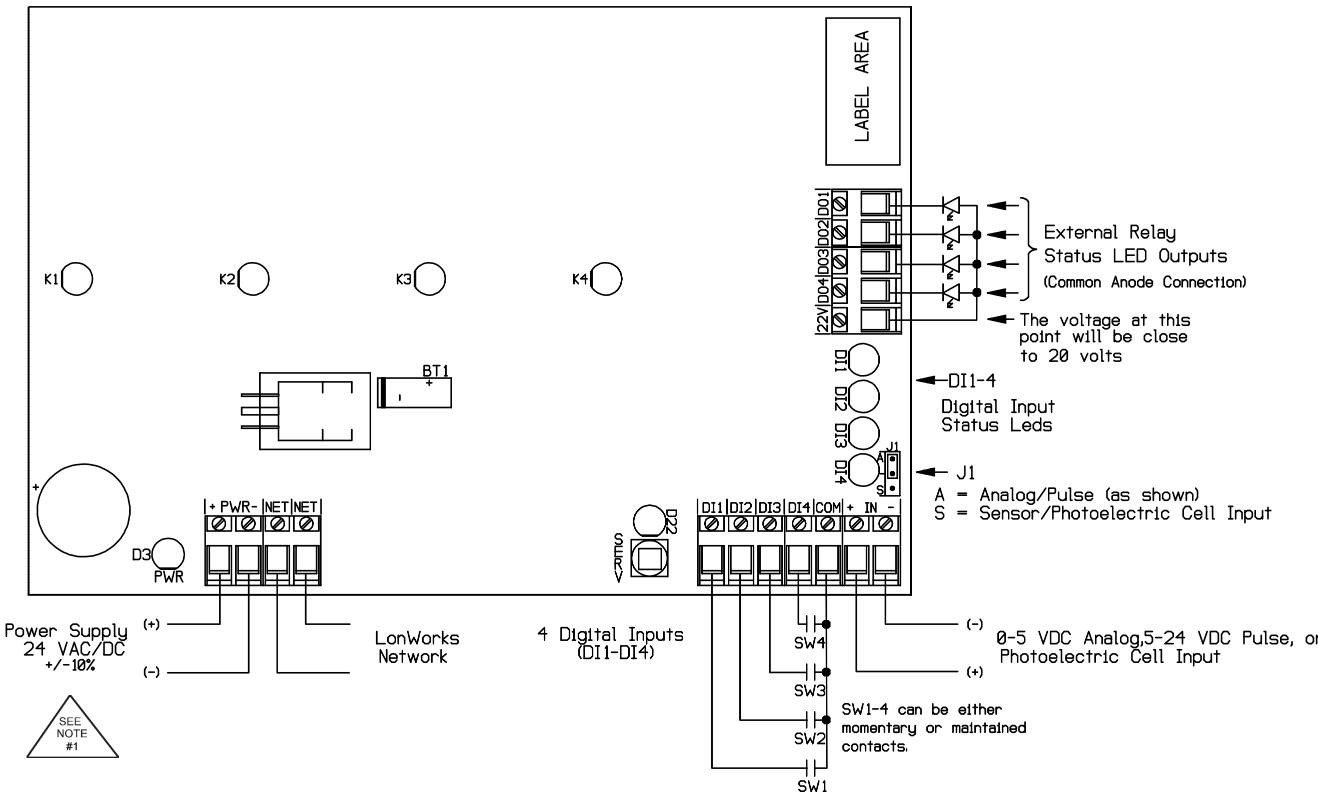
IONLON

*LonWorks Four Digital Input/Four Digital Output Node - **Version 2***



INSTALLATION

READ THESE INSTRUCTIONS BEFORE YOU BEGIN INSTALLATION.

Ground yourself before touching board. Some components are static sensitive.

MOUNTING:

Circuit board may be mounted in any position. If circuit board slides out of snap track, a nonconductive “stop” may be required. Use only fingers to remove board from snap track. Slide out of snap track or push against side of snap track and lift that side of the circuit board to remove. Do not flex board. Use no tools.

POWER CONNECTIONS - THIS PRODUCT ACCEPTS 24 VOLTS AC OR DC POWER.

NOTE #1

Be sure to follow all local and electrical codes. Refer to wiring diagram for connection information.

1) The power supply output voltage should be measured at the interface terminals and isolated from earth ground, chassis ground, and neutral leg of the primary winding. Any field device connected to this transformer must use the same common. If you are not sure of other field device configuration, use separate transformers. Failure to follow these procedures can result in improper operation.

2) If the 24 volt AC power is shared with devices that have coils such as relays, solenoids, or other inductors, each coil must have an MOV, AC Transorb, or other spike snubbing device across each of the shared coils. Without these snubbers, coils produce very large voltage spikes when de-energizing that can cause malfunction or destruction of electronic circuits.

3) If the 24 volt DC power is shared with devices that have coils such as relays, solenoids, or other inductors, each coil must have an MOV, DC Transorb, or a diode placed across the coil or inductor. The cathode or banded side of the diode (or DC Transorb) connects to the positive side of the power supply.

4) You should measure the actual voltage output of the secondary. If the output is not fully loaded you may read a higher voltage than the circuit board can handle.

CALIBRATION AND CHECKOUT

Use only with LonWorks FTT-10A free topology networks.

Jumper Shunt Selections: Select A setting on Jumper shunt J1 for analog or pulse inputs. Pulse input is configured in network software by user. Select S setting if input is to be from photocell. Cell impedance is configured in network software by user.

If digital inputs (overrides) are to be used, connect to terminals D1 through D4 and COM. If external status LED's are to be used, connect to DO1 through DO4 and 22V power source. Refer to drawing on page 1. Connect 24 VAC or 24 VDC to PWR (+) and (-). Connect LonWorks network to NET and NET (not polarity sensitive).

Supply power to terminals HOT and COM and the LED power indicator to left of power input terminal strip will light and the green LED will blink once rapidly and turn off. This indicates the IONLON Version 2 is functioning properly. Any other LED action indicates a malfunction.

The green LED to the left of the digital input(s) terminal strip will illuminate when the service switch is pressed to identify the node to the network, and anytime a WINK command is received.

Board programmed software includes Standard Network Variable Types (SNVT's) containing values

See pages 3 through 6 for setting Network variables.

Supply Voltage	24 VAC or VDC +/- 10% (21.6 to 26.4 volts)
Supply Current	150 mA maximum
Input	
Four (4) dry contact closures	DI1 to DI4. Dry contact closure to common, configured ` for momentary or maintained.
One (1) analog	0-5 VDC (Network selectable between analog or pulse counter)
One (1) Pulse	5-24 VDC, 20 mA maximum
One (1) photoelectric cell input	Analog input is shunt selectable for photoelectric cell input. Photoelectric cell impedance is network config ured by user.
Output	
Four (4) Digital Outputs	DO1 to DO4. Transistor (or open collector) outputs. Each output is limited to approximately 2.7 mA when 22V terminal is used. LED common anode connections from 22V (approx. 20V) to the DO1-4
Communications	
Neuron	MC143120E20DW (Motorola) or TMPN3120FE3M (Toshiba) (check product for brand model number)
Transceiver	Echelon Free Topology (FTT-10A)
Protocol	Echelon LonTalk ®

Configuring the IONLON, Version 2

The IONLON Version 2 is capable of operating under a variety of configurations depending upon the users need.

I. RESTORE CONFIGURATION

To configure the IONLON Version 2 to restore the digital outputs to their previous setting before power was lost, the network variable NV 30 should be set to the value of '1'.

To configure the IONLON Version 2 to have the digital outputs remain off upon power up, the network variable NV 30 should be set to the value of '0'.

Default : '1'

II. MODE CONFIGURATION

Each digital output can be programmed to react to the digital input in 1 of 6 ways called MODES. See Table 1.

Table 1 - MODE DESCRIPTIONS

MODE #	MODE DESCRIPTION
1	The digital input has no affect on the digital output.
2	The digital output reacts to the ON /OFF conditions of the digital input. No override timer
3	Same as MODE 2 except there IS an override timer
4	The digital outputs only turn ON. No override timer
5	Same as MODE 4 except there IS an override timer
6	The digital outputs only turn off. No override timer

Each digital output has a MODE variable which controls what mode the digital output will operate under. See Table 2.

To configure Digital Output 1, the network variable NV 20 should be programmed with the MODE number wanted. *For Example: if mode 3 was desired for Digital Output 1, NV 20 would be programmed with the value of '3'.*

Table 2 - MODE NETWORK VARIABLES

DIGITAL OUTPUT #	MODE NETWORK VARIABLE
1	NV 20
2	NV 21
3	NV 22
4	NV 23

Default : '2'

III. SWITCH CONFIGURATION

The digital inputs can be configured for momentary or maintained type digital outputs.

To program the digital inputs for momentary output, the assigned network variable should be programmed with the value of '0'.

To program the digital inputs for maintained output, the assigned network variable should be programmed with the value of '1'. See Table 3.

Table 3 - SWITCH CONFIGURATION

DIGITAL INPUT #	NETWORK VARIABLE
1	NV 26
2	NV 27
3	NV 28
4	NV 29

When in maintained mode, when the outputs are overridden by the LonWorks network, the switch must be toggled to regain the outputs original state.

For Example:

Digital Input 2 is turned on by a maintained switch, however digital output 2 has been turned off through the LonWorks network. To turn the digital output back on, the maintained switch must be switched to its OFF position and then back to its ON position.

Default : ‘0’.

IV. ANALOG INPUT CONFIGURATION

The analog input can be configured to function as a counter or as an analog to digital converter.

The counter can count accurately at a 2 Hz rate.

To configure the analog input for counter mode, the network variable NV 31 should be programmed with the value of ‘1’. **See section on analog input in NORMAL OPERATION for instructions on use.**

To configure the analog input for the analog to digital mode, the network variable NV 31 should be programmed with the value of ‘0’. **See section on analog input in NORMAL OPERATION for instructions on use.**

Default : ‘0’

V. OVERRIDE TIMER CONFIGURATION

Mode 3 and Mode 5 use the override timers. There are two override timers assigned to each output. They are called the “time off” timer and the “flash warning” timer. If any of the outputs are configured for Mode 3 or Mode 5, the override timers assigned to that output should be programmed with the desired “*time off”* time and with the desired “*flash”* warning time. See Table 4 for the assigned “time off” and “flash” network variables.

Table 4 TIMER ASSIGNMENTS

OUTPUT NUMBER	TIME OFF NETWORK VARIABLE	FLASH NETWORK VARIABLE
1	NV 12	NV 16
2	NV 13	NV 17
3	NV 14	NV 18
4	NV 15	NV 19

1 minute ≤ time ≤ 255 minutes.

For Example:

Output should turn off 150 minutes after it is turned on with a flash warning 10 minutes before it is to turn off.

NV 12 should be programmed with the value of 150

NV 16 should be programmed with the value of 10

To program an output with an off time *without* a warning flash time, program the value 0 into the corresponding “*flash warning*“ network variable.

To keep the output from turning off the corresponding switch should be pressed before the time runs out. The timers will restart.

Default : “*timer off” = 20*
“flash warning”= 3 (lights turn off and back on, warning that they will go off shortly)

Normal Operation

I. OVERRIDE OUTPUTS

It is possible to turn the digital outputs on or off through the LonWorks network (termed override).

The digital inputs and a request through the LonWorks network (override) have the same priority and the digital outputs (depending upon mode) will respond to the latest signal from either one. The network variables used to “override” the outputs are shown in Table 5.

To “override” an output to OFF, the network variable assigned to that output should be programmed with a value of ‘0’.

To “ override” an output to ON, the network variable assigned to that output should be programmed with a value of ‘1’.

Table 5 - OVERRIDE OUTPUTS OFF = ‘0’ ON = ‘1’

DIGITAL OUTPUT	NETWORK VARIABLE
1	NV 8
2	NV 9
3	NV 10
4	NV 11

II. INPUT STATUS

The status of the digital inputs can be determined through the LonWorks network using the network variables assigned to each input. The digital input number and the network variable assigned to that input are given in Table 6.

Table 6 - INPUT STATUS ‘0’ = OFF ‘1’ = ON

DIGITAL INPUT	NETWORK VARIABLE
1	NV 0
2	NV 1
3	NV 2
4	NV 3

The input status variables always toggle when switch is pressed except for the following circumstances:

When changing modes after IONLON Version 2 has been installed, the digital inputs status variables will take the current status of the outputs . This occurs only if in momentary mode.

When an output has been overridden, the inputs will take on the value OPPOSITE of the outputs whenever the switch is used again. *For Example:*

The input status has the value of ON however, the corresponding output has been overridden by the LonWorks network to OFF: When the switch is pressed again, the input status will STILL have a value of ON, the output status (MODE 2,3, 4, or 5) will have the value of ON and the digital output will turn on.

III. OUTPUT STATUS

The status of the digital outputs can be determined through the LonWorks network using the network variables assigned to each output. The digital output number and the network variable assigned to that output is given in Table 7.

Table 7 - DIGITAL OUTPUT NETWORK VARIABLES ‘0’ = OFF ‘1’ = ON

DIGITAL OUTPUT	NETWORK VARIABLE
1	NV 4
2	NV 5
3	NV 6
4	NV 7

IV. ANALOG INPUT OPERATION

When the Analog Input is configured for the analog to digital converter, the IONLON Version 2 will detect a 0 - 5 VDC input on a 0 - 255 scale. The digital value will be contained in network variable NV 25.

When the Analog Input is configured for PULSE input, the counter will count to 65535 before flipping back to 0 and begin counting again. The count will be contained in network variable NV 25.

If the Analog Input is configured for PULSE input, a span of time can be evaluated by writing a ‘0’ to the network variable NV 24. When this network variable is updated, the network variable NV 25 will reset to 0 and begin counting again.