

2-DIGIT UP/DOWN COUNTER

Catalog No. NL-362

DESCRIPTION

Two digit Up/Down Counter with optional internal or external thumbwheels and digital readout. Includes LED and test point for A = B output.

Catalog numbers for available options:

- NL-362 (no options) Provides BCD outputs. Counts from 00 to 99.
- NL-362T (with thumbwheel).
- NL-362R (with readout).
- NL-362A (binary version) Provides binary outputs. Counts from 00 to FF.
- NL-362TR (thumbwheel and readout).
- NL-362AR (binary version with readout).

For high-speed modules (0.1 ms propagation delay) add HS to catalog number (i.e., NL-362 THS).

PICTORIAL LENS. Standard lens shown.

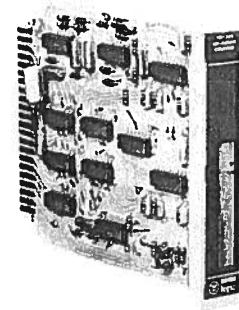
TEST POINTS. A = B output accessible at front faceplate to facilitate signal tracing.

TERMINATION. Nickel gold-plated edge pins are used for all input-output connections.

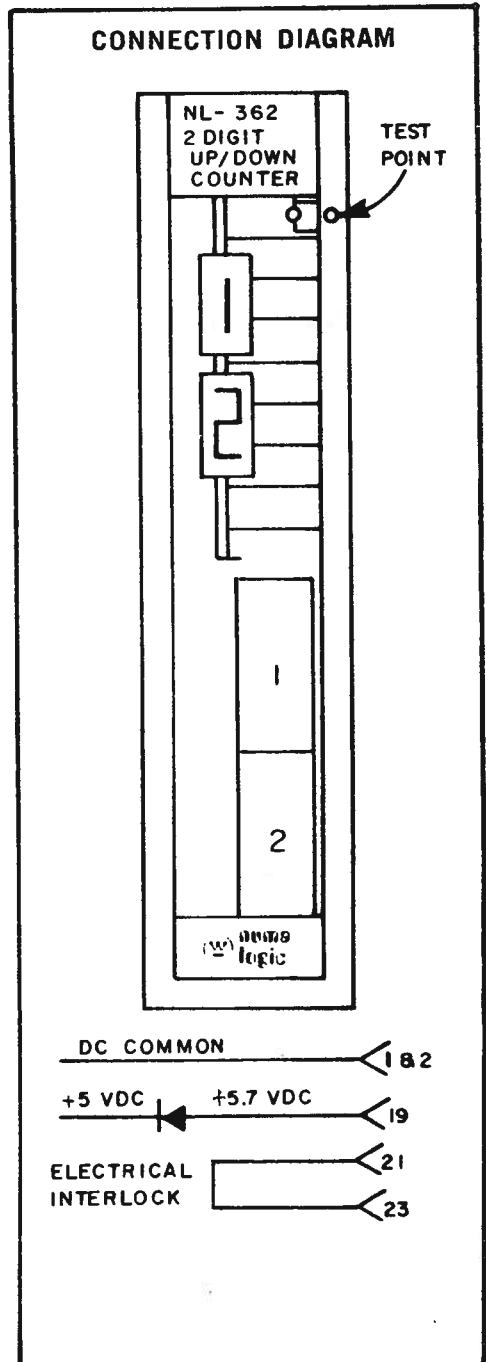
KEY SLOTS. Prevent incorrect module replacement.

SPECIFICATIONS

Number of circuits	1
Logic type	TTL
Fan-in	
Logic 1	1 unit load (1.6 mA, source)
Logic 0	1 unit load (40 microamps, sink)
Fan-out	
Logic 1	10 unit loads (16 mA, source)
Logic 0	10 unit loads (400 microamps, sink)
Logic levels	
Logic 1	0.0 to 0.8 VDC
Logic 0	2.4 to 5.0 VDC
Propagation delay	
NL-362	0.5 ms, 950 Hz (nominal)
NL-362HS	0.1 ms, 4750 Hz (nominal)
	Modules with options are also offered at both speeds.
Power requirement	+5.7 ± 0.25 VDC
Without readouts	275 mA
With readouts	650 mA
Temperature rating	0° to 85° C
With internal readout	0° to 75° C
Noise energy rejection	5 x 10 ⁻⁶ watt seconds
Mechanical keying	Between pins 13 & 15 and pins 25 & 27
Electrical interlock	Pin 21 to pin 23
Control signals	
CLOCK inputs	1 ms, min. (500 Hz)
CLEAR input	1 ms, min.
Preset load	1 ms, min.



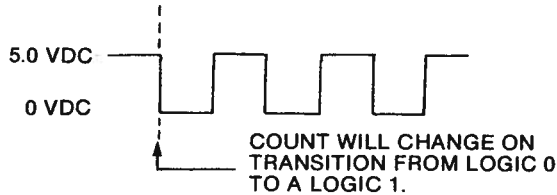
CONNECTION DIAGRAM



2-DIGIT UP/DOWN COUNTER

APPLICATION NOTES

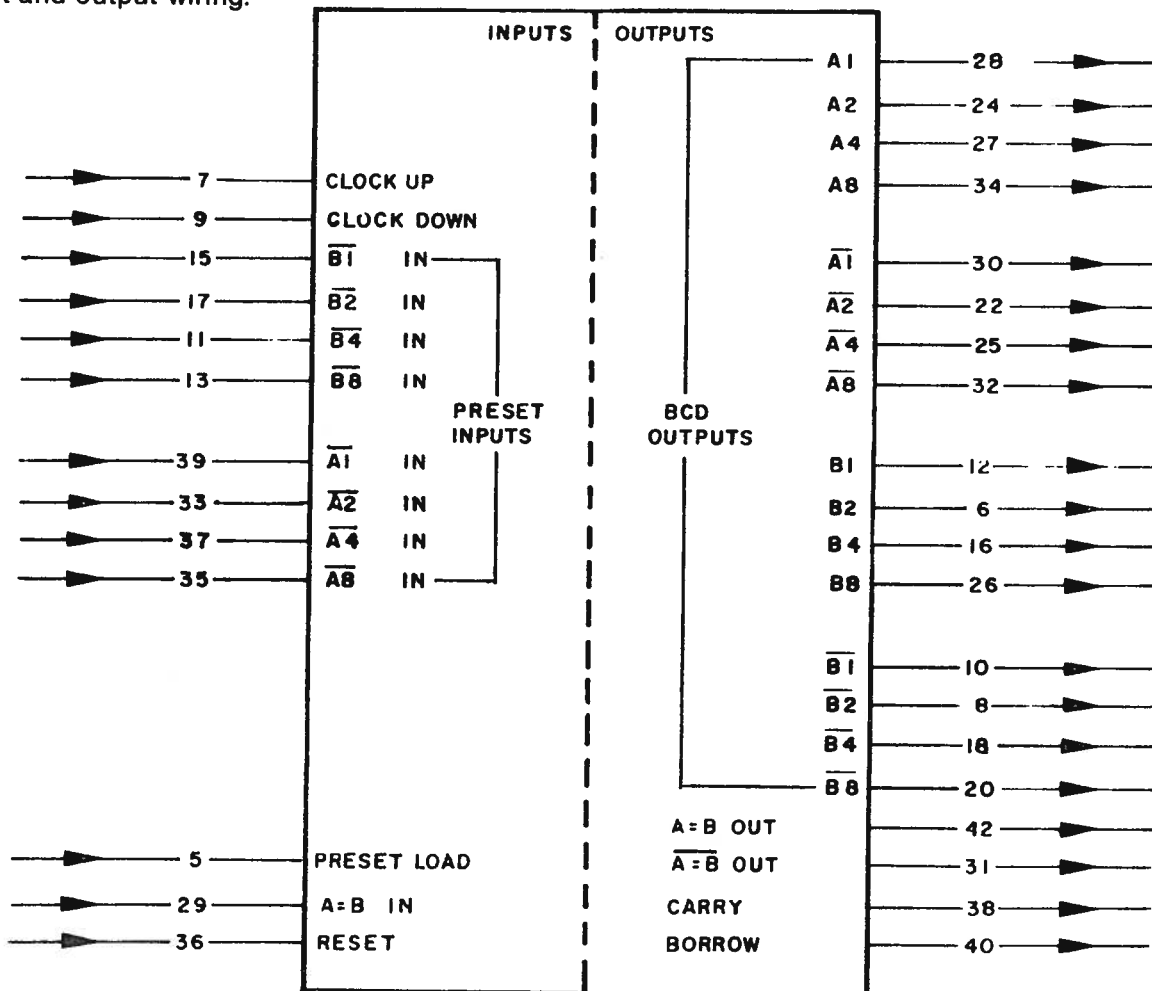
1. Contains power-on reset delay circuit; sets counter to 00 (30 ms, nominal).
2. A = B OUTPUT. When counter equals number selected by thumbwheels, output will become TRUE (logic 1) and LED will light.
3. RESET: Logic 1 at RESET input sets counter back to 00. RESET overrides clock and preset load. Preset load overrides clock.
4. COUNTER APPLICATION: A clock pulse (1 ms long, min. for NL-362; 0.2 ms, min. for NL-362HS) at CLOCK input will cause counter to increment. NOTE: Unused clock must be held TRUE.



5. The counter can be programmed by entering the desired data at the preset input (in NOT form). The information will be entered when the preset load input becomes TRUE (Pin 5).

APPLICATION EXAMPLES

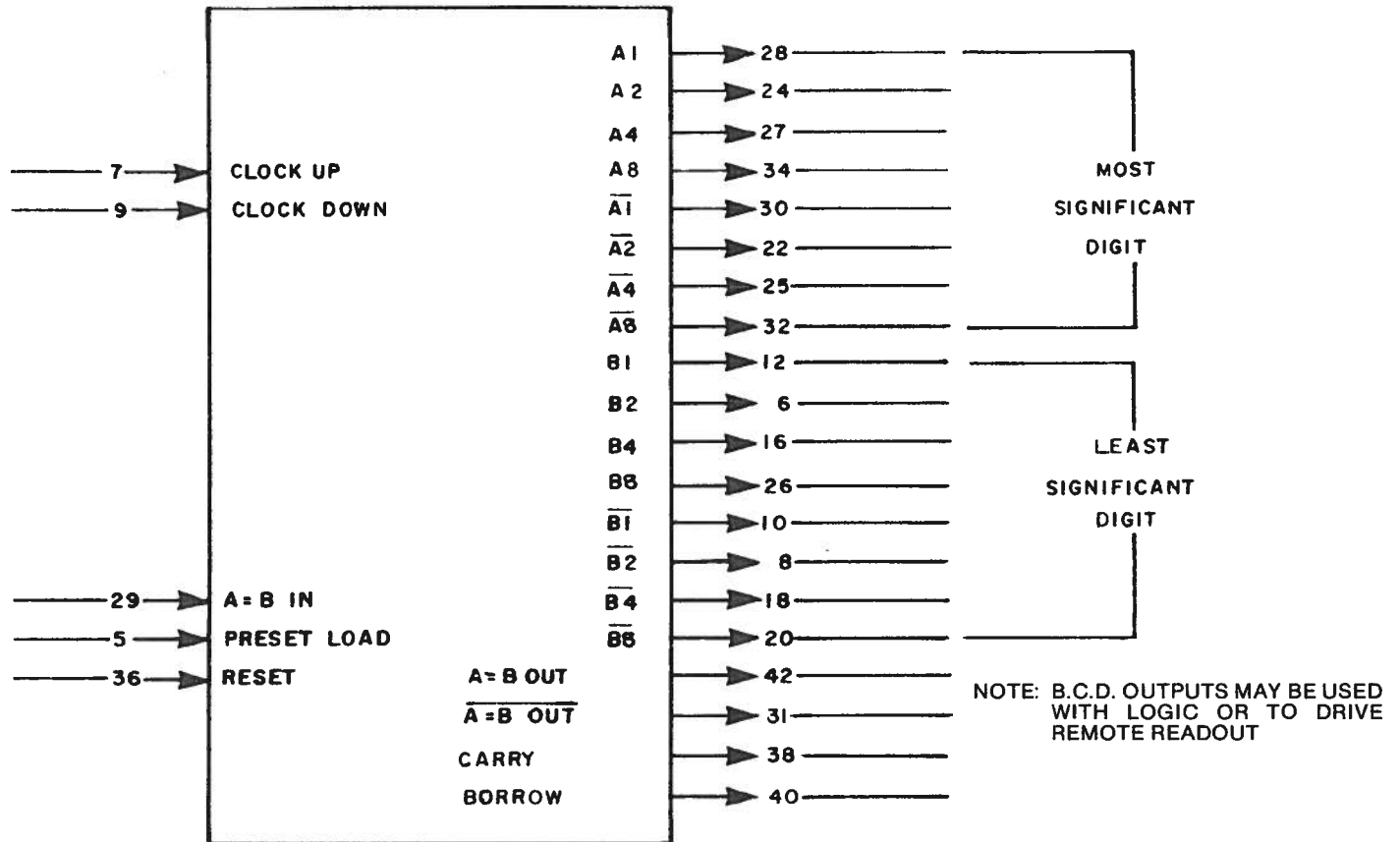
1. Input and output wiring.



APPLICATION EXAMPLES

2. Cascade Operation

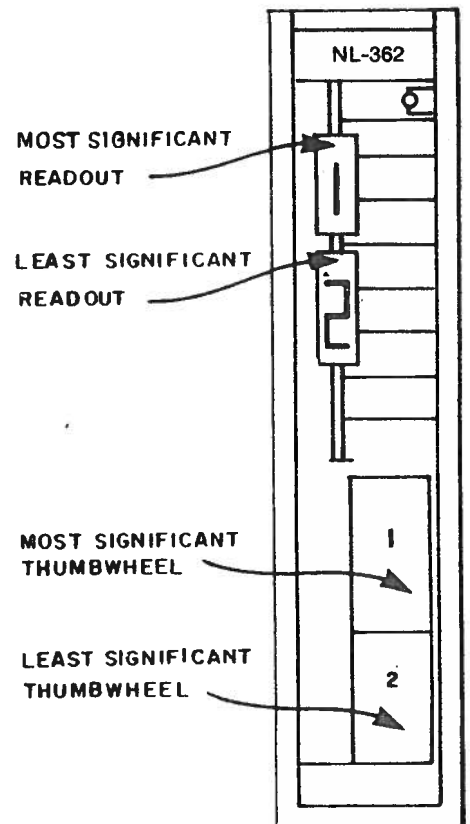
2-DIGIT UP/DOWN COUNTER



A = B OUT connected to A = B IN of next card for cascade operation.

3. Remote Operation

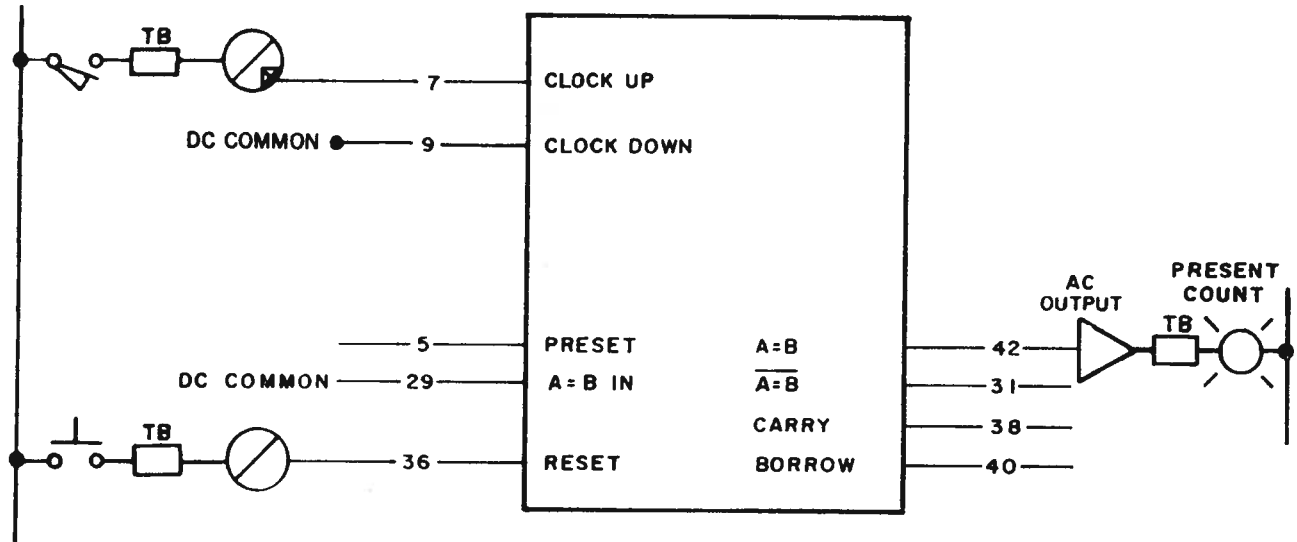
- A. Maximum distance from module to remote readout and/or thumbwheel inputs is 20 feet.
- B. Use Remote Readout, Catalog Number NLR-002
- C. Use Remote Thumbwheel, Catalog Number NLT-002
- D. Connector and Cable for external thumbwheel inputs, Catalog Number NLT-005.



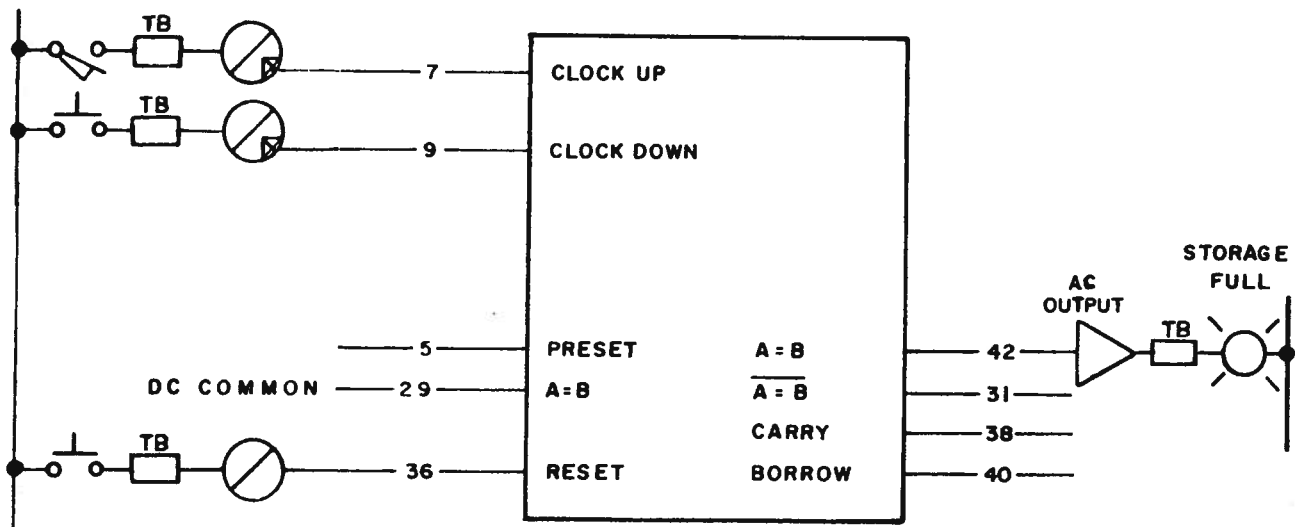
2-DIGIT UP/DOWN COUNTER

APPLICATION EXAMPLES

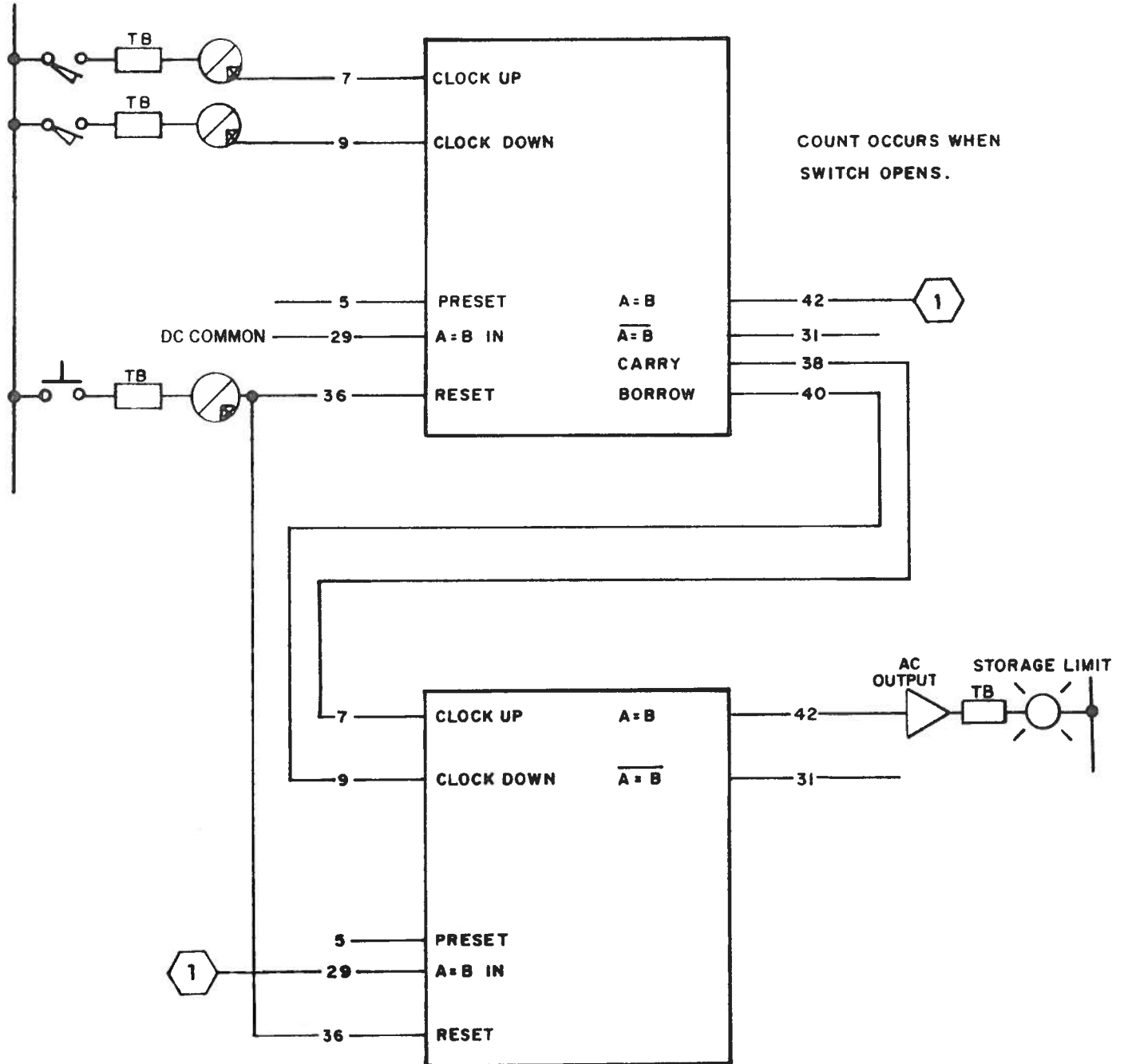
4. Digital Counter Up (0-99)



5. Digital Counter Up/Down (0-99)



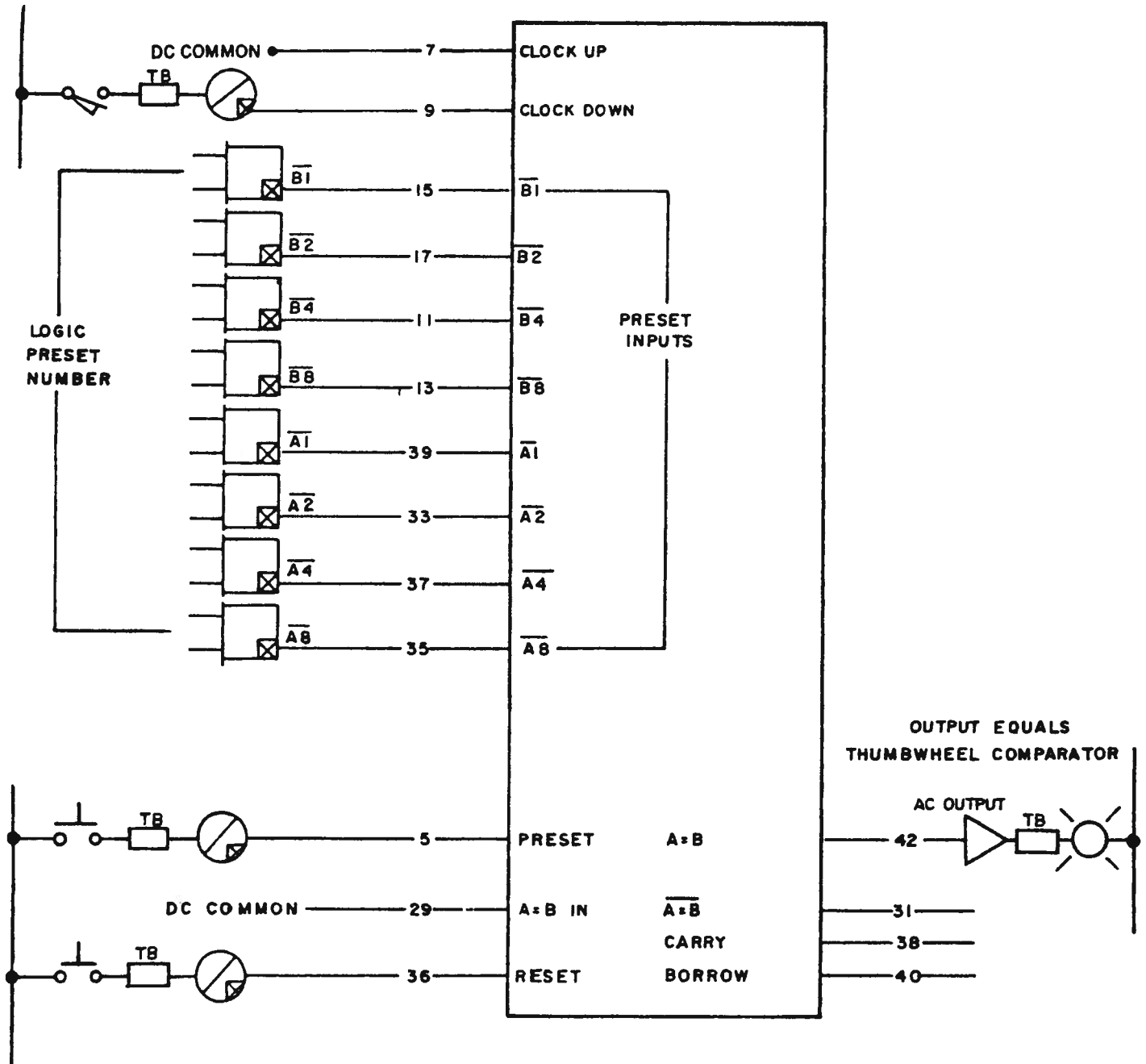
6. Digital Counter Up/Down Cascade Operation (0-9999)



2-DIGIT UP/DOWN COUNTER

APPLICATION EXAMPLES

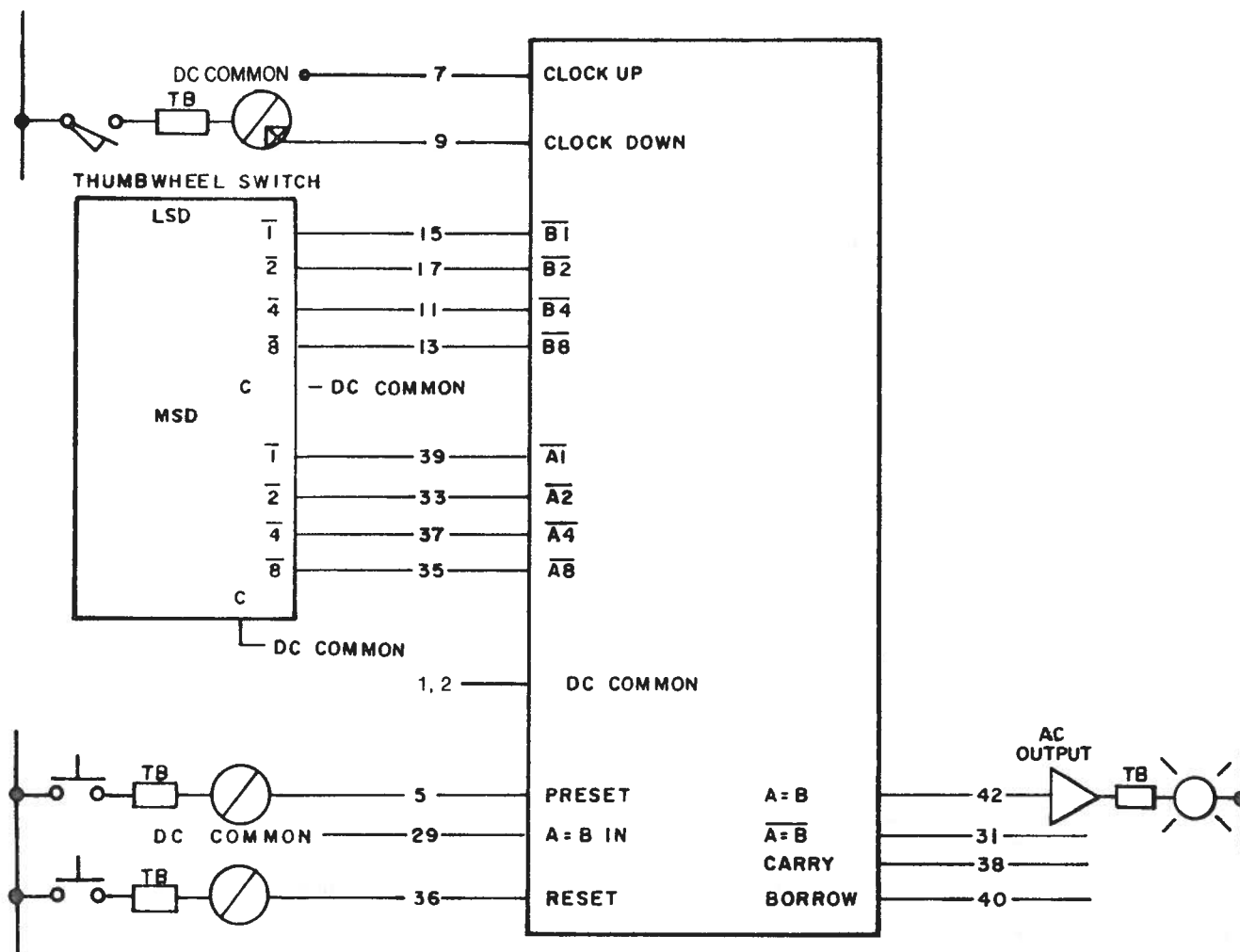
7. Thumbwheel Comparator



2-DIGIT UP/DOWN COUNTER

APPLICATION EXAMPLES

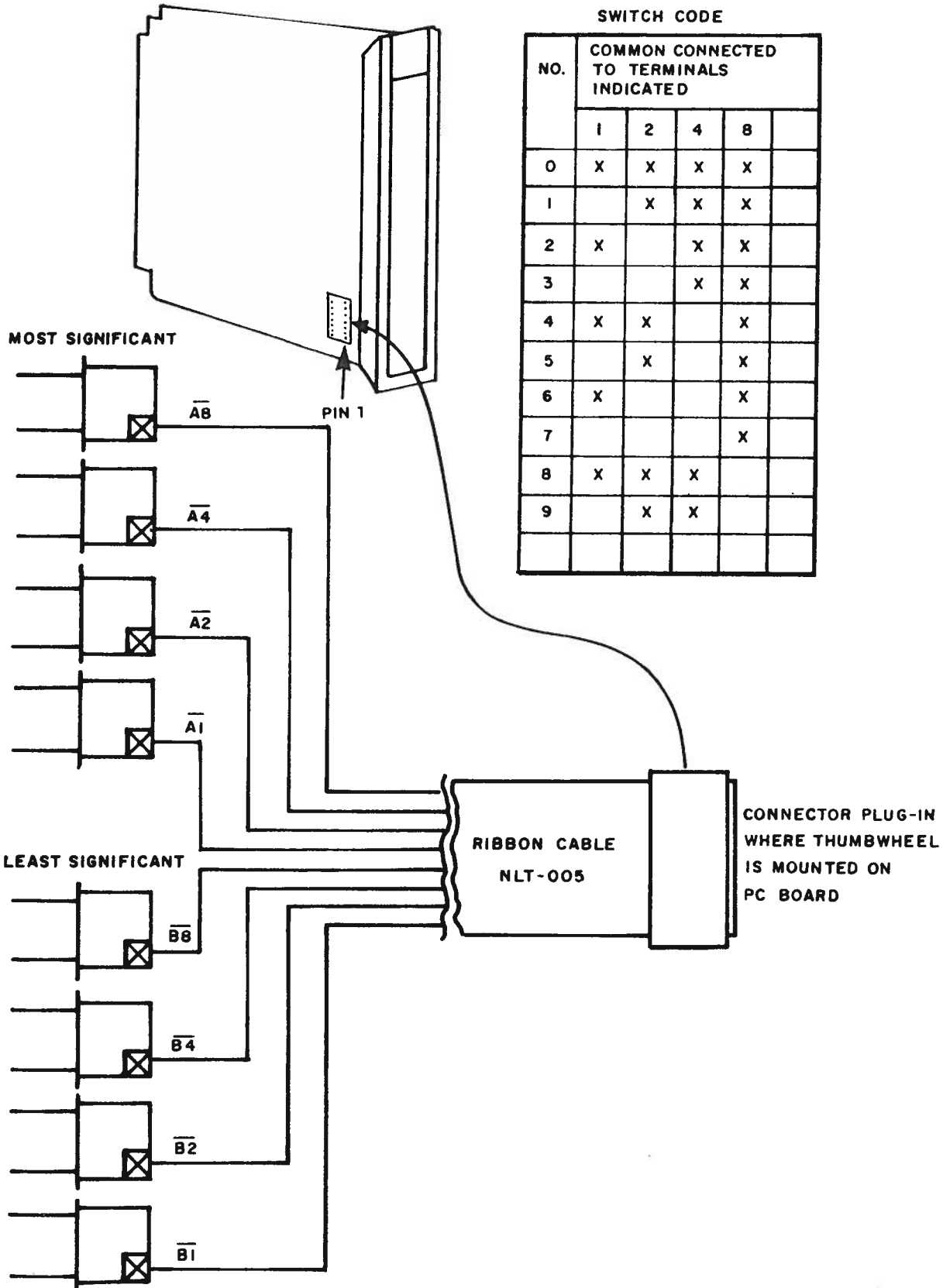
8. Digital Up/Down Counter with Remote Thumbwheel



2-DIGIT UP/DOWN COUNTER

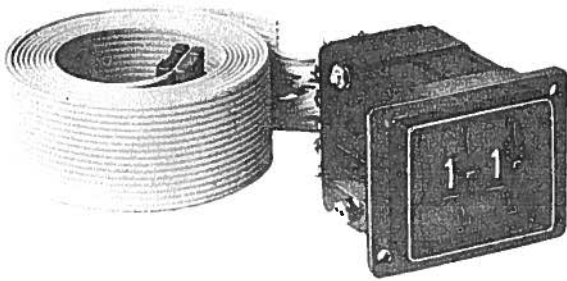
APPLICATION EXAMPLES

9. Logic Gates Used to Replace Thumbwheel Switch on Timer Cards

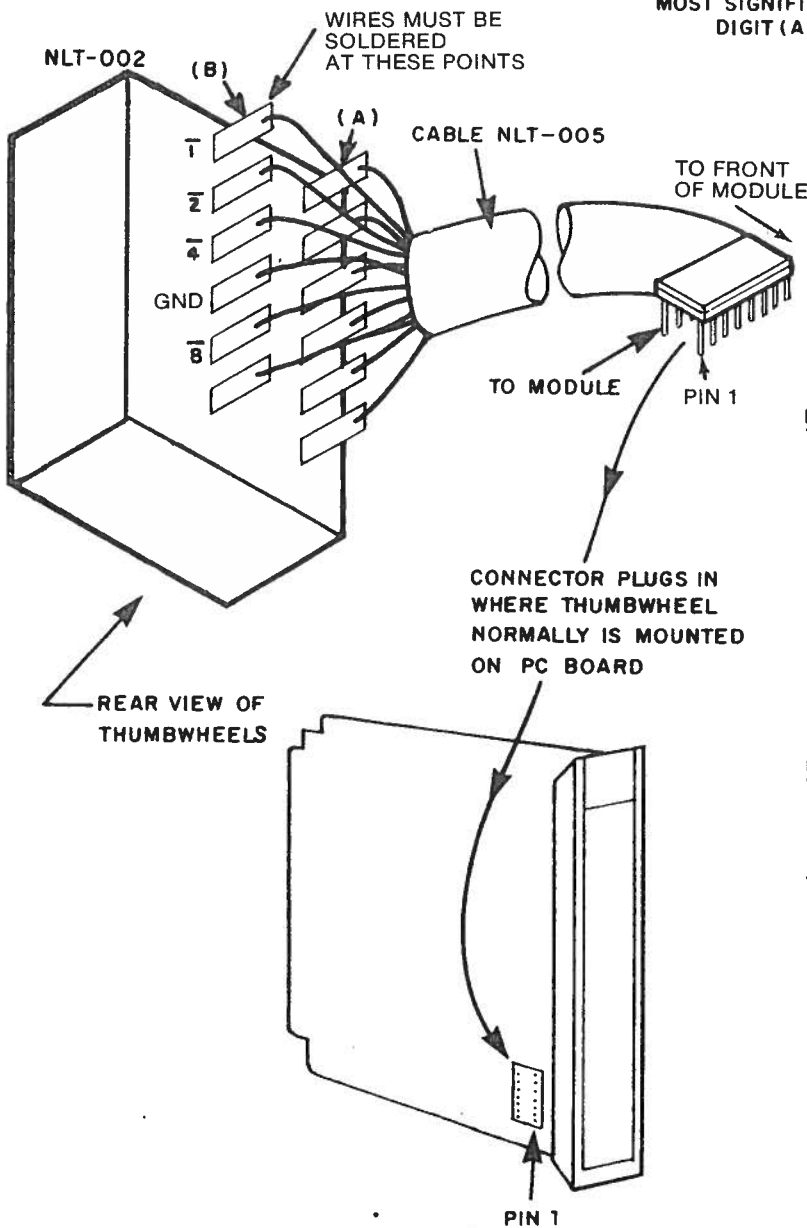
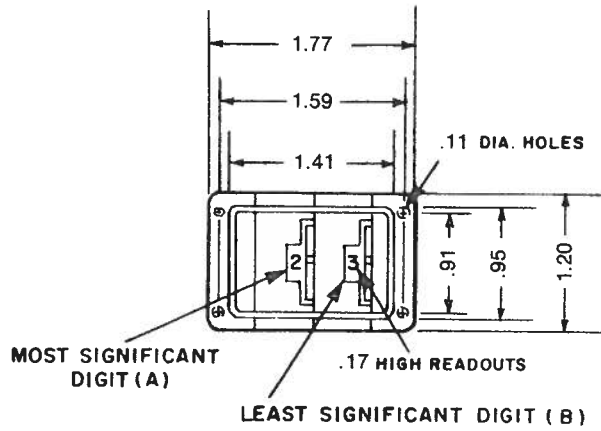


2-DIGIT UP/DOWN COUNTER

REMOTE THUMBWHEELS NLT-002. Cannot be used with the NL-362A (binary version).



DIMENSIONS in inches



NOTE:
PINS 8 AND 9 DO NOT
PLUG INTO SOCKET
BUT EXTEND OVER
TOP EDGE

CONNECTIONS

FUNCTION	WIRE NO.	CONNECTOR PIN
NC	16	8
NC	15	9
DC COMMON	GND	14
		7
NC	13	10
A ₂	12	6
B ₁	11	11
A ₁	10	5
B ₂	9	12
NC	8	4
DC COMMON	GND	7
		13
A ₄	6	3
DC COMMON	GND	5
		14
A ₈	4	2
B ₄	3	15
NC	2	1
B ₈	1	16

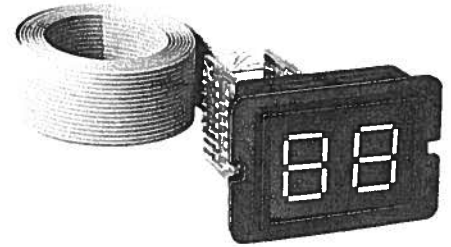
RED STRIPE
A = PREFIX MSD B = PREFIX LSD



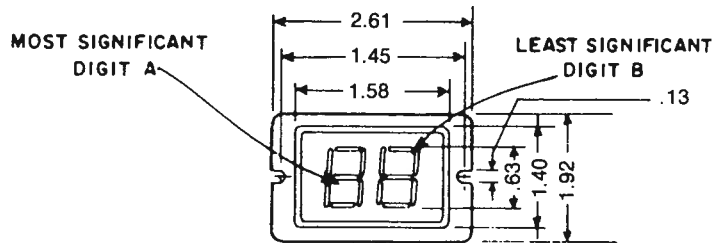
2-DIGIT UP/DOWN COUNTER

REMOTE READOUT NLR-002. Cannot be used with the NL-362A (binary version).

Temperature range	0° to 65° C
Supply voltage	+5 ± 0.25 VDC
Supply current	508 mA, all segments illuminated (2 digit)
	535 mA, all segments and decimal point illuminated (2 digit)
Maximum remote distance	20 feet
When decimal is required	Jumper pins K and J of digit A on NLR-002

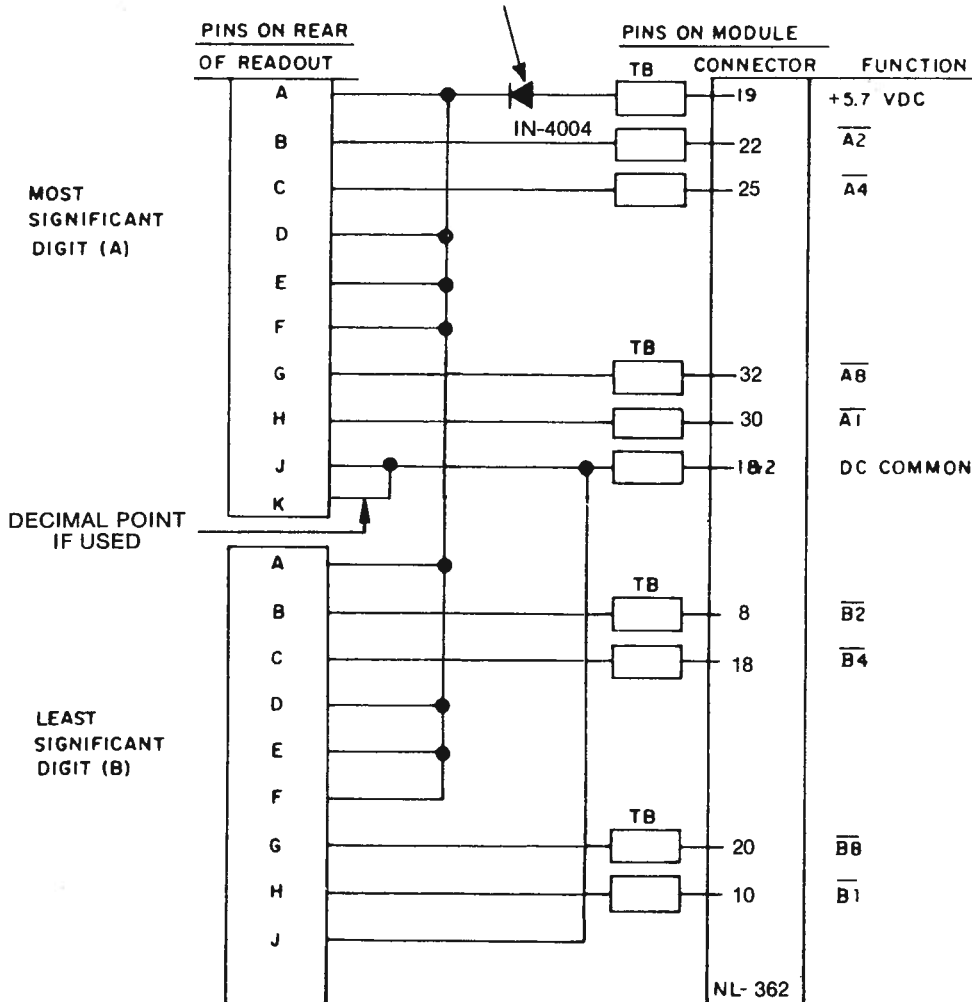


DIMENSIONS in inches



CONNECTIONS

NOTE: EXTERNAL DIODE MUST BE ADDED



COINCIDENCE INPUT Catalog No. NL-363L

DESCRIPTION

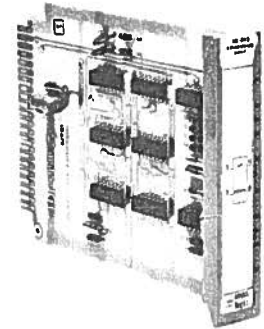
Coincidence Input: Used with Up/Down Counter whenever the possibility of simultaneous or overlapping Up/Down Clock pulses exists. Up/Down pulses will be put on the output one at a time depending on the order of the pulses coming in.

PICTORIAL LENS. Standard lens shown.

TEST POINTS. All outputs are accessible at front faceplate to facilitate signal tracing.

TERMINATION. Nickel gold-plated edge pins are used for all input-output connections.

KEY SLOTS. Prevent incorrect module replacement.

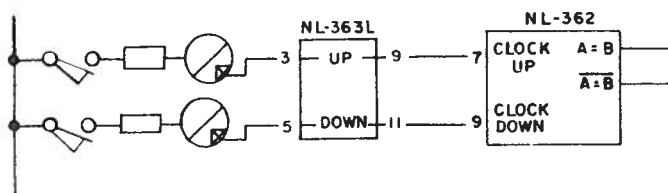


SPECIFICATIONS

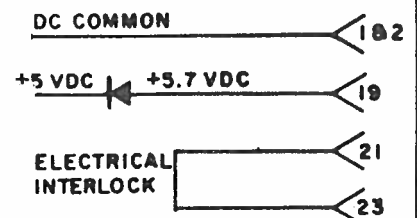
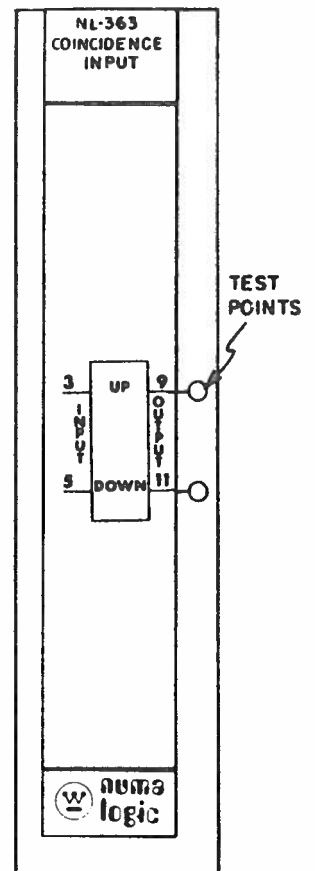
Number of circuits	1
Logic type	TTL
Fan-in	
Logic 1	1 unit load (1.6 mA, source)
Logic 0	1 unit load (40 microamps, sink)
Fan-out	
Logic 1	10 unit loads (16 mA, sink)
Logic 0	10 unit loads (400 microamps, source)
Logic levels	
Logic 1	0.0 to 0.8 VDC (nominal)
Logic 0	2.4 to 5.0 VDC (nominal)
Propagation delay	
NL-363L	3 ms, 165 Hz (nominal)
NL-363LH	0.5 ms, 950 Hz (nominal)
NL-363LHS	0.1 ms, 4750 Hz (nominal)
Power requirement	+ 5.7 ± 0.25 VDC, 137 mA
Temperature rating	0° to 85° C
Noise energy rejection	1 x 10 ⁻⁶ watt seconds
Mechanical keying	Between pins 13 & 15 and pins 27 & 29
Electrical interlock	Pin 21 to pin 23
UP input (pin 3)	Counter pulses applied to up or down inputs must have a duration of 1 ms, min. and not exceed repetition rate of 500 Hz.
DOWN input (pin 5)	

APPLICATION NOTES

1. Typical diagram of coincidence input and two-digit Up/Down Counter.

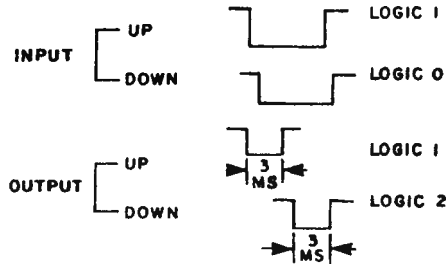


CONNECTION DIAGRAM



COINCIDENCE INPUT

2. Output pulse occurs when input becomes FALSE, except when overlapping occurs (3 ms, nominal).



3. Contains power-on reset delay circuit (30 ms, nominal).