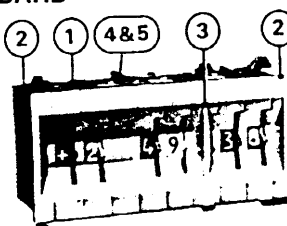
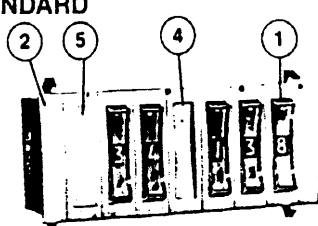
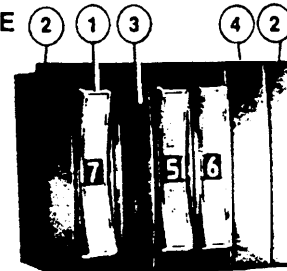
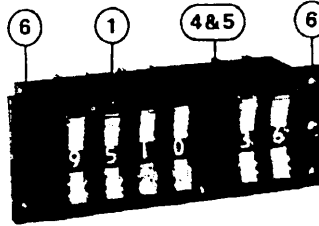
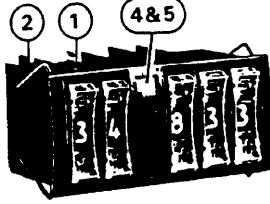
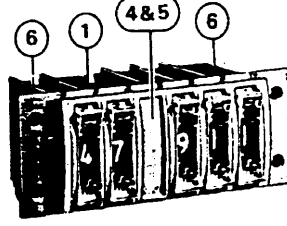
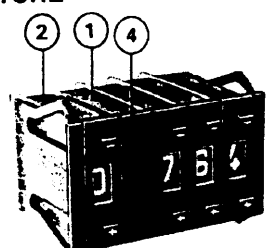
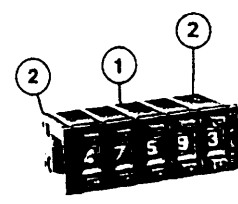
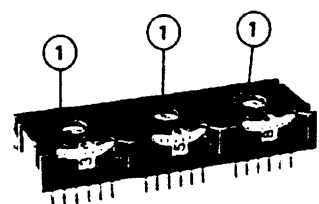


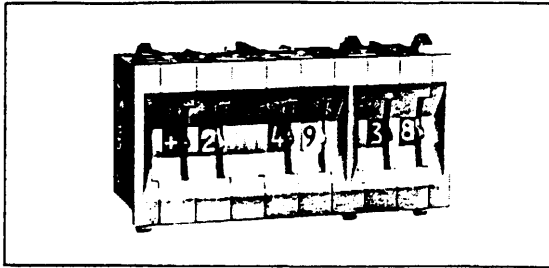
## Index

<p><b>STANDARD</b></p>  <p><b>84 210</b> Thumbwheel Standard – Panel Mount Page 5</p>	<p><b>STANDARD</b></p>  <p><b>84 211</b> Rocker Standard – Panel Mount Page 6</p>	<p><b>LARGE</b></p>  <p><b>84 212</b> Rocker Large – Panel Mount Page 7</p>
<p><b>STANDARD</b></p>  <p><b>84 213</b> Rocker Standard – Rear Mount Page 8</p>	<p><b>MINIATURE</b></p>  <p><b>84 214</b> Rocker Miniature – Panel Mount Page 9</p>	<p><b>MINIATURE</b></p>  <p><b>84 218</b> Rocker Miniature – Rear Mount Page 10</p>
<p><b>MINIATURE</b></p>  <p><b>84 230</b> Push Button Miniature – Panel Mount Page 12</p>	<p><b>SUBMINIATURE</b></p>  <p><b>84 231</b> Push Button Subminiature – Panel Mount Page 13</p>	 <p><b>84 235</b> Thumbwheel PCB – Flat Mount Page 14</p>

- 1 – **Basic Module:** Enable data input in coded form.
- 2 – **End Caps:** Snap into place to complete module assembly. Complete with 4 panel clips.
- 3 – **Separator:** Used to fit 2 switch assemblies into one unit. They come with 2 clips.
- 4 – **Spacer:** Blank module used to replace a module assembly.
- 5 – **Encoded “Dummy” Module:** Enables simultaneous switching to two circuits from one digital switch, it is driven by the adjacent module via a coupling shaft.
- 6 – **End Caps:** For rear mounting of module assembly. They come in pairs.

Other Index Items	Page
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Truth Tables .....	11 & 15
How To Order – (Switches) .....	16
L.E.D. Readout .....	17-22
How To Order – (L.E.D. Readouts) .....	23

## General Information

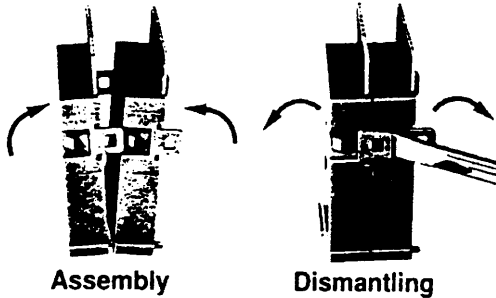


### Wheel Marking

- Large size figures or symbols give maximum readability.
- Complies with European Aeronautics standard BN Aë - NF L 70130.
- Special markings are available on request.

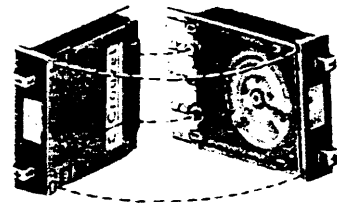
**Assembly Series:** 84210, 84211, 84212, 84213, 84214, 84218

- Modules snap into place – easily disassembled
- No mounting hardware needed



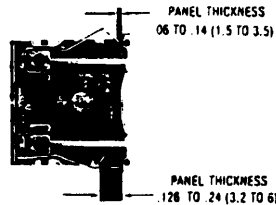
**Assembly Series:** 84230, 84231, 84235

- Snap fit – No tools, no hardware



**Clip Mounting Series** 84210, 84211, 84212, 84213, 84214, 84218

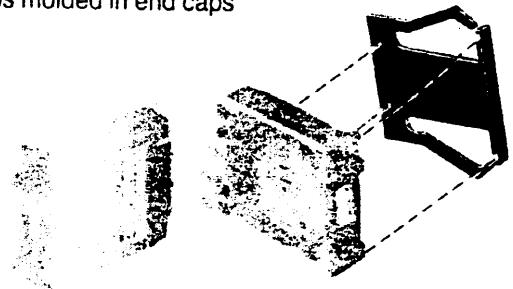
- Two clip assembly combination available: Panel thickness – .06 - .14 in. (1.5 - 3.5mm) Panel thickness – .126 - .24 in. (3.2 - 6mm).
- Clips supplied in pairs with end plates or spacers.



**Dimensions** in inches (mm)

**Series** 84230, 84231, 84235

- No clip mounting necessary
- Clips molded in end caps



### Colors

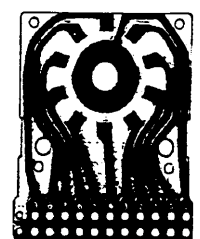
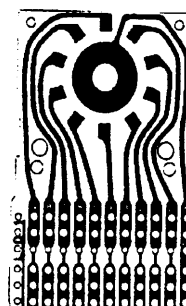
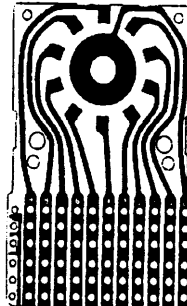
- Standard modules come in black (grey upon request).
- Standard wheels are black or red with white markings.
- Optional wheels: (except series 84230, 84231, 84235) Green or blue with white markings. Yellow with black markings

### Dial Stops

- Limit the rotation of the dial to any number of positions, to be specified when ordering.

### Circuit Boards

- All our digital switches are provided with printed circuit boards made of glass-filled P.C. 75 epoxy composite board, .03 in. (.08 mm) thick, covered with copper plated with nickel and gold.
- Two types of circuit boards are available: Short for direct connection or long for component mounting such as resistors or diodes, in series or parallel. (See photos).
- **Note** 84231 – MO1 and MO3: no long circuit board and no hole on circuit available.

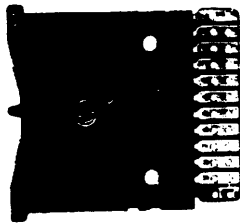


# Crouzet® Digital Switches

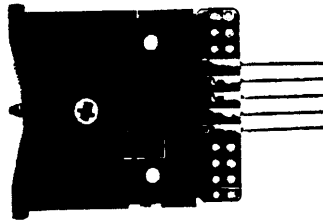
## Switch Terminations and Connectors

### Terminals

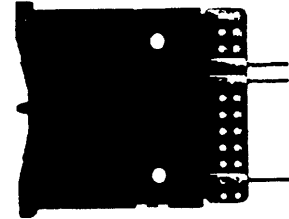
- Three types of terminations:
  - Direct soldering or plug-in for connectors (S)
  - Pins for wire wrapping (X2) – Except Series 84230, 84231, 84235
  - Pins for P.C. board soldering (X3).



**S**



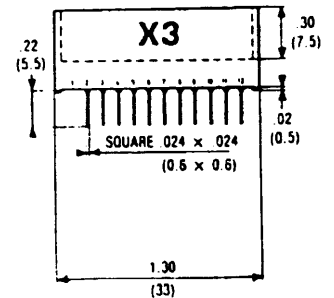
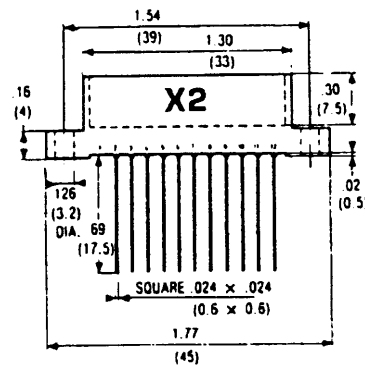
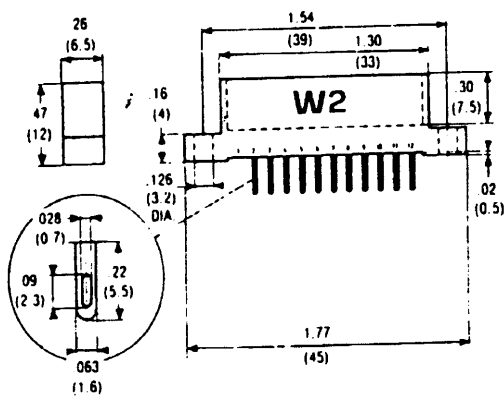
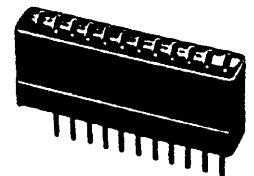
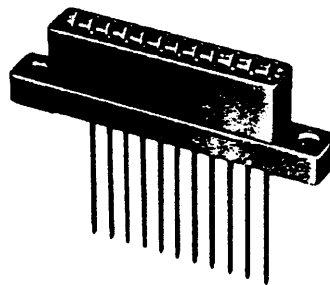
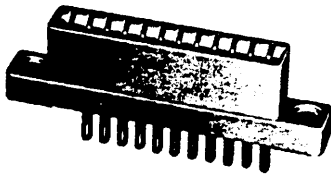
**X2**



**X3**

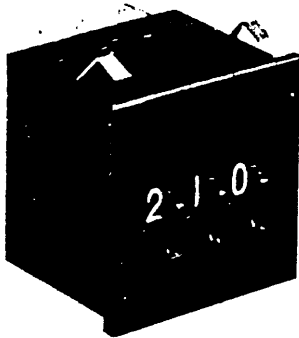
### Connectors (for Series 84210, 84211, 84212, 84213)

- Connectors available:
  - Solder terminals (W2)
  - Wire wrap terminals (X2)
  - P.C. board solder terminals (X3).



Dimensions in inches (mm)

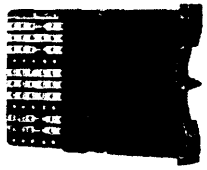
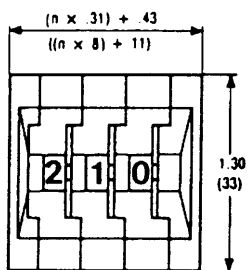
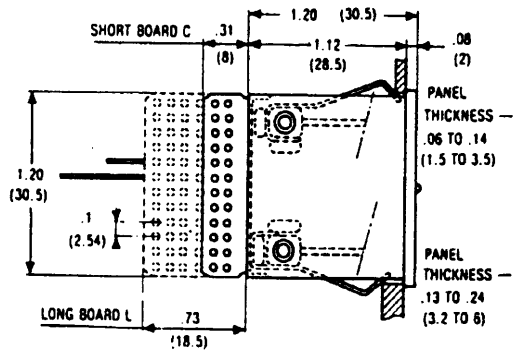
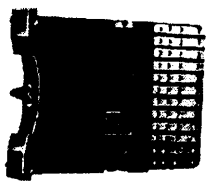
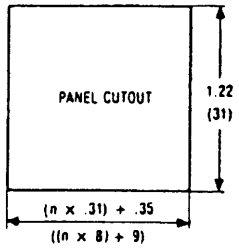
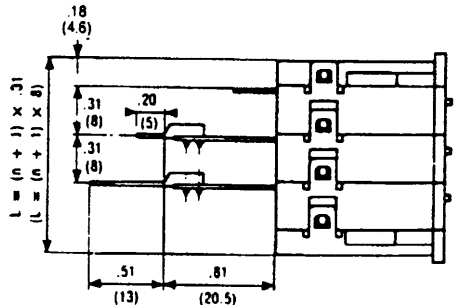
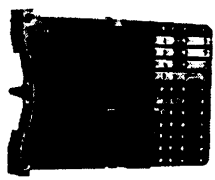
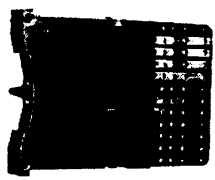
## Thumbwheel - standard - panel mount Series 84 210



- Large numerals — .18 in. (4.5 mm) high
- All modules easily assembled without hardware
- Black or red wheels standard—other colors on request
- Right-sided circuits — left-sided optional
- Modules will accommodate our L.E.D. readouts

Mechanical & Electrical Specifications		Materials
<b>Operating Voltage:</b> .1 to 250 V AC .1 to 50 V DC <b>Nominal Electrical Load (Resistive Load):</b> .1 mA to 100 mA <b>Maximum Non-Switching Load:</b> 1 A <b>Contact Resistance:</b> 70 mΩ max. <b>Life at 50 V DC, .1 A, Resistive Load:</b> 1 million operations <b>Note:</b> For voltages and currents less than the above values, please consult us.	<b>Dielectric Strength:</b> 600 V <b>Operating Temperatures:</b> —13° F. to 158° F. (—25° C. to 70° C.) <b>Storage Temperatures:</b> —40° F. to 185° F. (—40° C. to 85° C.) <b>Dial Character Dimensions:</b> .18 in. x .11 in. (4.5 mm x 2.8 mm) <b>Operating Torque:</b> 10 oz. ( 300 g)	<b>Case:</b> Noryl <b>Wheel:</b> Delrin <b>Contacts and Tracks:</b> Copper—Nickel—Gold <b>Brush:</b> Beryllium bronze <b>Printed Circuit Board:</b> Glass-filled epoxy (P.C. 75)

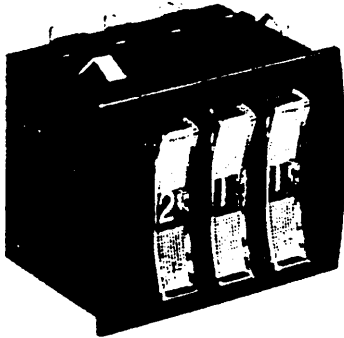
**Option:** The P.C. boards of the standard 84 210 type modules are mounted on the right side of the module. The decimal and BCD codes can, optionally, be mounted onto the left side of the module. In this case the outputs are as shown below. Please contact us.

Standard:	Dimensions in inches (mm)	
		
<b>Option:</b> 		
<b>Decimal M 09</b> 		
<b>BCD M10</b> 		



# Digital Switches

## Rocker Switch - standard - panel mount Series 84 211



- Fast switching in both directions
- Large numerals — .18 in. (4.5 mm) high
- All modules easily assembled without hardware
- Good looking—easy to read
- Black or red wheels standard — other colors on request

### Mechanical & Electrical Specifications

**Operating Voltage:** .1 to 250 V AC  
.1 to 50 V DC

**Nominal Electrical Load (Resistive Load):**  
.1 mA to 100 mA

**Maximum Non-Switching Load:** 1 A  
**Contact Resistance:** 70 mΩ max.

**Life at 50 V DC, .1 A, Resistive Load:** 1 million operations

**Note:** For voltages and currents less than the above values, please consult us.

**Dielectric Strength:** 600 V

**Operating Temperatures:** —13° F. to 158° F. (—25° C. to 70° C.)

**Storage Temperature:** —40° F. to 185° F. (—40° C. to 85° C.)

**Dial Character Dimensions:** .18 in. x .11 in. (4.5 mm x w.8 mm)

**Operating Force at End of Rocker:** 17 oz. (500 g)

### Materials

**Case:** Noryl

**Wheel:** Delrin

**Rocker Actuator:** Makrolon® (Polycarbonate)

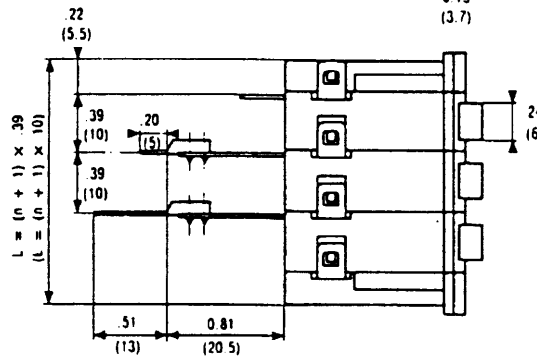
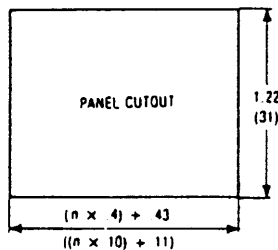
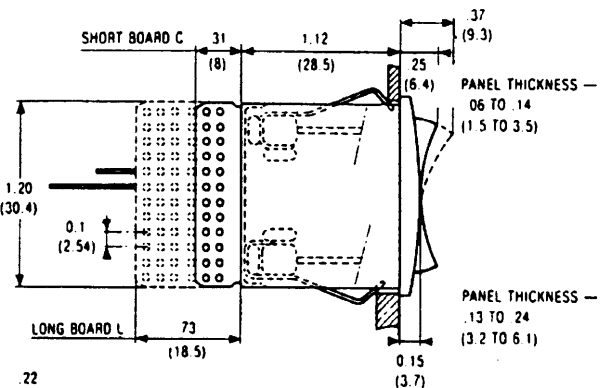
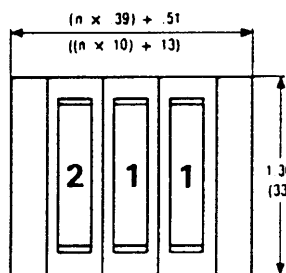
**Contracts and Tracks:** Copper—Nickel—Gold

**Brush:** Beryllium bronze

**Printed Circuit Board:** Glass-filled epoxy (P.C. 75)

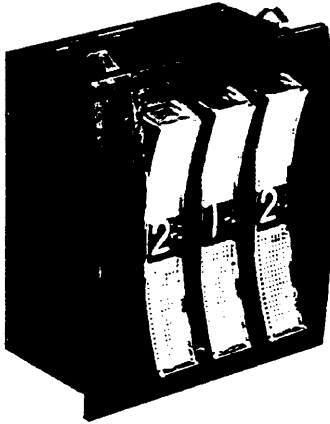
\*Special elements not used in other manufacturers' products.

### Dimensions in inches (mm)



# Crouzet® Digital Switches

## Rocker Switch - large - panel mount Series 84 212



- Fast switching with large rocker actuator
- Extra large numerals — .24 in. (6 mm) high for easy reading
- All modules easily assembled without hardware
- Attractive

### Mechanical & Electrical Specifications

**Operating Voltage:** .1 to 250 V AC  
.1 to 50 V DC

**Nominal Electrical Load (Resistive Load):**  
.1 mA to 100 mA

**Maximum Non-Switching Load:** 1 A

**Contact Resistance:** 70 mΩ max.

**Life at 50 V DC, .1A, Resistive Load:** 1 million operations

**Note:** For voltages and currents less than the above values, please consult us.

**Dielectric Strength:** 600 V

**Operating Temperatures:** —13° F. to 158° F. (—25° C. to 70° C.)

**Storage Temperatures:** —40° F. to 185° F. (—40° C. to 85° C.)

**Dial Character Dimensions:** .24 in. x .15 in. (6 mm x 3.75 mm)

**Operating Force at End of Rocker:** 10 oz. (300 g)

### Materials

**Case:** Noryl

**Wheel:** Delrin

**Rocker Actuator:** Makrolon\* (Polycarbonate)

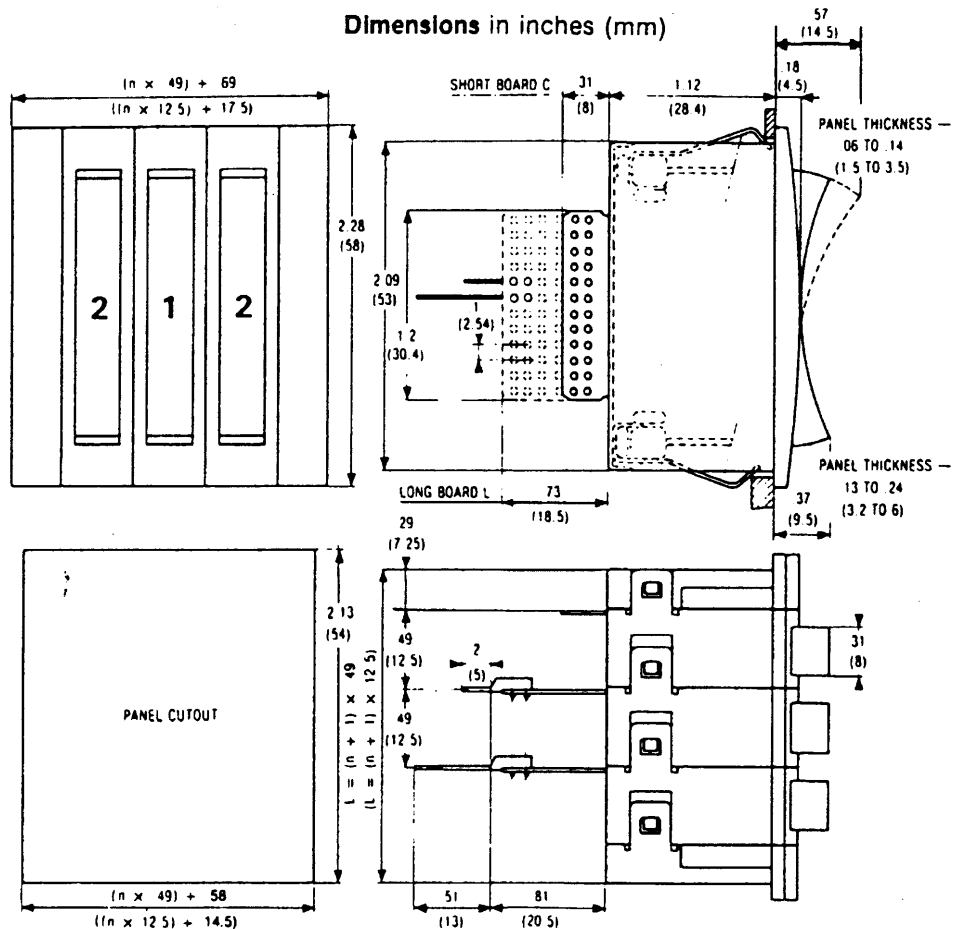
**Contacts and Tracks:** Copper—Nickel—Gold

**Brush:** Beryllium bronze

**Printed Circuit Board:** Glass-filled epoxy (P.C. 75)

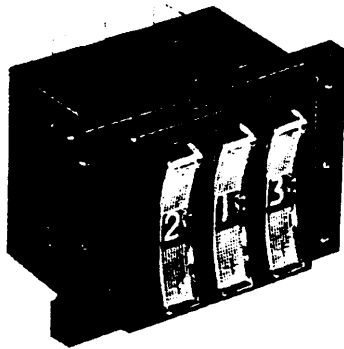
\*Special elements not used in other manufacturers' products.

### Dimensions in inches (mm)



# Crouzet® Digital Switches

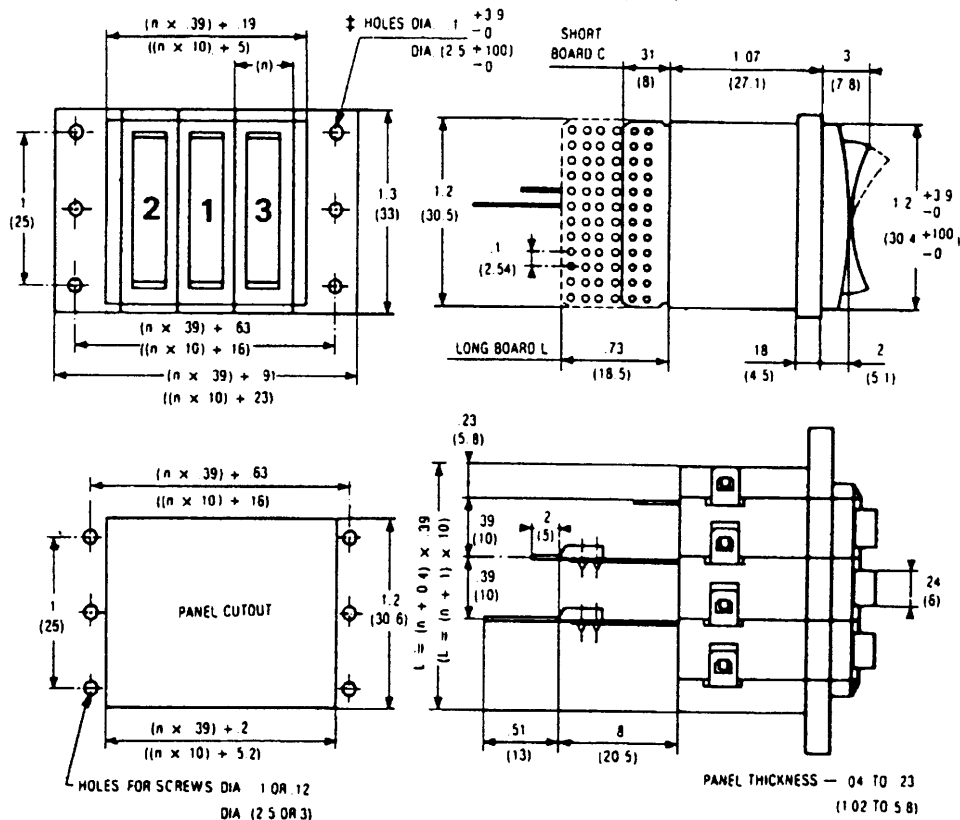
## Rocker Switch - standard - rear mount Series 84 213



- Fast switching in both directions
- Large numerals — .18 in. (4.5 mm) high
- All modules easily assembled without hardware
- Good looking—easy to read
- Black or red wheels in stock — other colors on request

Mechanical & Electrical Specifications		Materials
<b>Operating Voltage:</b> .1 to 250 V AC .1 to 50 V DC	<b>Dielectric Strength:</b> 600 V	<b>Case:</b> Noryl
<b>Nominal Electrical Load (Resistive Load):</b> 1 mA to 100 mA	<b>Operating Temperatures:</b> —13° F. to 158° F. (—25° C. to 70° C.)	<b>Wheel:</b> Delrin
<b>Maximum Non-Switching Load:</b> 1 A	<b>Storage Temperatures:</b> —40° F. to 185° F. (—40° C. to 85° C.)	<b>Rocker Actuator:</b> Makrolon* (Polycarbonate)
<b>Contact Resistance:</b> 70 mΩ max.	<b>Dial Character Dimensions:</b> .18 in. x .11 in. (4.5 mm x 2.8 mm)	<b>Contacts and Tracks:</b> Copper—Nickel—Gold
<b>Life at 50 V DC, .1 A, Resistive Load:</b> 1 million operations	<b>Operating Force at End of Rocker:</b> 17 oz. (500 g)	<b>Brush:</b> Beryllium bronze
<b>Note:</b> For voltages and currents less than the above values, please consult us.		<b>Printed Circuit Board:</b> Glass-filled epoxy (P.C. 75)
		*Special elements not used in other manufacturers' products.

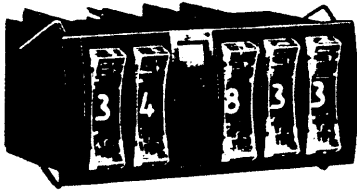
### Dimensions in inches (mm)



‡Note: Mounting by screws and nuts .09 in. (2.5 mm) dia. or self-tapping screws .11 in. (3 mm) dia.

# Rocker Switches

Rocker Switch - miniature - panel mount Series 84 214



- Fast switching in both directions
- Large numerals — .16 in. (4.0 mm) high
- All modules easily assembled without hardware
- Good looking—easy to read
- Black wheels standard — other colors on request

## Mechanical & Electrical Specifications

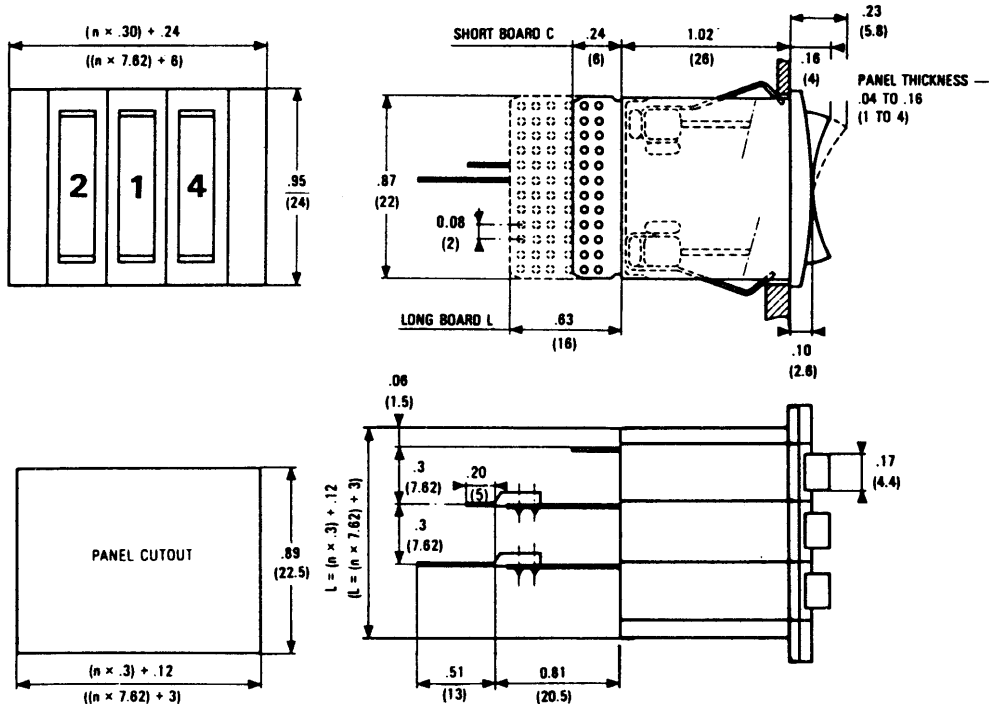
**Operating Voltage:** .1 to 250 V AC  
.1 to 50 V DC  
**Nominal Electrical Load (Resistive Load):**  
.1 mA to 100 mA  
**Maximum Non-Switching Load:** 1 A  
**Contact Resistance:** 120 mΩ max.  
**Life at 50 V DC, .1A, Resistive Load:** 1 million operations  
**Note:** For voltages and currents less than the above values, please consult us.

**Dielectric Strength:** 600 V  
**Operating Temperatures:** —13° F to 158° F. (—25° C. to 70° C.)  
**Storage Temperatures:** —40° F. to 185° F. (—40° C. to 85° C.)  
**Dial Character Dimensions:** .16 in. x .10 in. (4.0 mm x 2.5 mm)  
**Operating Force at End of Rocker:** 17 oz. (500 g)

## Materials

**Case:** Noryl  
**Wheel:** Delrin  
**Rocker Actuator:** Makrolon\* (Polycarbonate)  
**Contacts and Tracks:** Copper—Nickel—Gold  
**Brush:** Beryllium bronze  
**Printed Circuit Board:** Glass-filled epoxy (P.C. 75)  
\*Special elements not used in other manufacturers' products.

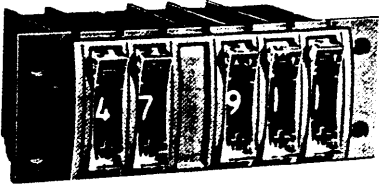
## Dimensions in inches (mm)





# Rocker Switches

## Rocker Switch - miniature - rear mount Series 84 218



- Fast switching in both directions
- Large numerals — .16 in. (4.0 mm) high
- All modules easily assembled without hardware
- Good looking—easy to read
- Black wheels in stock — other colors on request

### Mechanical & Electrical Specifications

**Operating Voltage:** .1 to 250 V AC  
.1 to 50 V DC

**Nominal Electrical Load (Resistive Load):**  
.1 mA to 100 mA

**Maximum Non-Switching Load:** 1 A

**Contact Resistance:** 120 mΩ max.

**Life at 50 V DC, .1 A, Resistive Load:** 1 million operations

**Note:** For voltages and currents less than the above values, please consult us.

**Dielectric Strength:** 600 V

**Operating Temperatures:** —13° F. to 158° F. (—25° C. to 70° C.)

**Storage Temperatures:** —40° F. to 185° F. (—40° C. to 85° C.)

**Dial Character Dimensions:** .16 in. x .10 in. (4.0 mm x 2.5 mm)

**Operating Force at End of Rockers:** 17 oz. (500 g)

### Materials

**Case:** Noryl

**Wheel:** Delrin

**Rocker Actuator:** Makrolon\* (Polycarbonate)

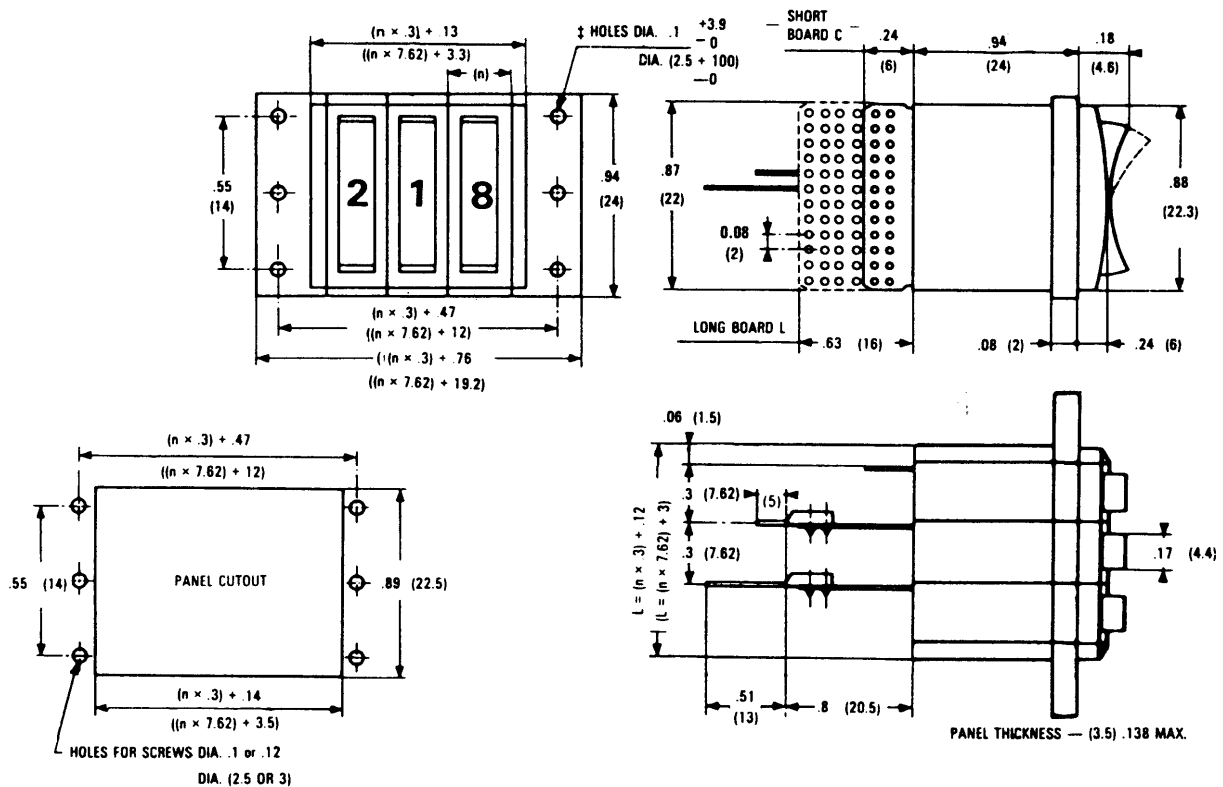
**Contacts and Tracks:** Copper—Nickel—Gold

**Brush:** Beryllium bronze

**Printed Circuit Board:** Glass-filled epoxy (P.C. 75)

\*Special elements not used in other manufacturers' products.

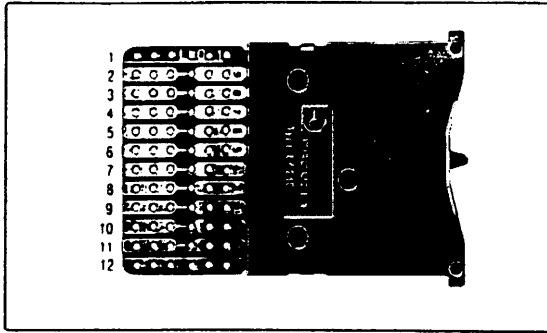
### Dimensions in inches (mm)



‡Note: Mounting by screws and nuts .09 in. (2.5 mm) dia. or self-tapping screws .11 in. (3 mm) dia.

# Crouzet® Digital Switches

## Truth Tables - Series 84 210 - 84 211 - 84 212 - 84 213 - 84 214 - 84 218



This photograph shows the numbering of each terminal for location purposes only.

The dots indicate the inter-connected tracks for each of the dial settings.

Decimal M01—M13—M14 (see note)

		C	0	1	2	3	4	5	6	7	8	9
Location on PC Board		12	11	10	9	8	7	6	5	4	3	2
Dial Setting	0	•	•									
	1	•		•								
	2	•			•							
	3	•				•						
	4	•					•					
	5	•						•				
	6	•							•			
	7	•								•		
	8	•									•	
	9	•										•

B.C.D.—M02

		C	1	2	4	8
Location on PC Board		9	8	7	6	5
Dial Setting	0	•				
	1	•	•			
	2	•		•		
	3	•	•	•		
	4	•			•	
	5	•	•	•	•	
	6	•	•	•	•	
	7	•	•	•	•	
	8	•				•
	9	•	•			•

B.C.D. + Complement—M03

		C	1	2	4	8	$\bar{1}$	$\bar{2}$	$\bar{4}$	$\bar{8}$
Location on PC Board		7	6	5	4	3	11	10	9	8
Dial Setting	0	•					•	•	•	•
	1	•	•					•	•	•
	2	•		•			•		•	•
	3	•	•	•				•	•	•
	4	•			•		•	•		•
	5	•	•	•	•			•		•
	6	•		•	•	•	•		•	•
	7	•	•	•	•				•	•
	8	•				•	•	•	•	•
	9	•	•			•	•	•	•	•

2 Position Repeating—M04

Type of Track		C	1	2
Location on PC Board		2	9	8
Dial Setting (To be specified)	+ 5	•	•	
	- 0	•		•
	+ 5	•	•	•
	- 0	•		•
	+ 5	•	•	
	- 0	•		•
	+ 5	•	•	
	- 0	•		•
	+ 5	•	•	
	- 0	•		•

B.C.D. Complement—M07

Type of Track		C	$\bar{1}$	$\bar{2}$	$\bar{4}$	$\bar{8}$
Location on PC Board		3	4	11	2	10
Dial Setting	0	•	•	•	•	•
	1	•		•	•	•
	2	•		•	•	•
	3	•			•	•
	4	•	•	•		•
	5	•		•		•
	6	•				•
	7	•				•
	8	•	•	•	•	•
	9	•		•	•	•

B.C.D. EXCESS 6 + Complement—M08

Type of Track		C	1	2	4	8	$\bar{1}$	$\bar{2}$	$\bar{4}$	$\bar{8}$
Location on PC Board		7	6	5	4	3	11	10	9	8
Dial Setting	0	•		•	•		•			•
	1	•	•	•	•					•
	2	•				•	•	•	•	
	3	•	•			•	•			•
	4	•		•		•	•			•
	5	•	•	•		•				•
	6	•			•	•	•	•		•
	7	•	•	•	•	•	•			•
	8	•		•	•	•	•			•
	9	•	•	•	•	•	•			•

Hexadecimal B.C.D. - M 29\*

		C	1	2	4
Location on PC Board		7	11	9	2
Dial Setting	0	•			
	1	•	•		
	2	•		•	
	3	•	•	•	
	4	•			•
	5	•	•	•	•
	6	•	•	•	•
	7	•	•	•	•
	8	•			•
	9	•	•		
	10	•		•	
	11	•	•	•	
	12	•			•
	13	•	•	•	•
	14	•	•	•	•
	15	•	•	•	•

Note: In decimal and BCD the following alternatives are available.\*

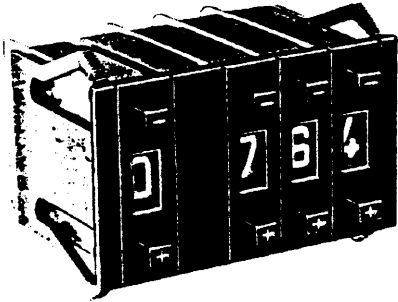
	Short Board	Long Board for Mounting of Resistors or Diodes	
		In Series on Each Track (Interrupted Tracks)	In Parallel from Track to Track (Non-Interrupted Tracks)
Break Before Make	M0 1-C (Decimal) M0 2-C (BCD)	M0 1-L (Decimal) M0 2-L (BCD)	M 14-L (Decimal) M 15-L (BCD Complement)
Make Before Break (on Request)	M 13-C (Decimal)	M 13-L (Decimal)	

\*84 210 only

\*Please consult us for special codes.

# Digital Switches

## Push Button - miniature - panel mount Series 84 230



- Long circuit boards have track interruption to allow series mounting of components
- All modules easily assembled without hardware
- Black wheel standard – white wheel with black marking on request
- Fast, smooth switching action

### Mechanical & Electrical Specifications

**Max. operating voltage:**

switched 50 VAC  
unswitched 120 VAC

**Rated amperage:** switched 1-50mA

**Max. amperage:** unswitched 500mA

**Min. contact resistance:** .1 ohm

**Min. insulation resistance:** 100,000 megohms

**Dielectric strength:**

between tracks: 500 VAC

between tracks and ground: 2,500 VAC

**Operating temperature:**

+ 15°F to + 160°F (-10°C to + 70°C)

**Storage temperature:**

-40°F to + 185°F (-40°C to + 85°C)

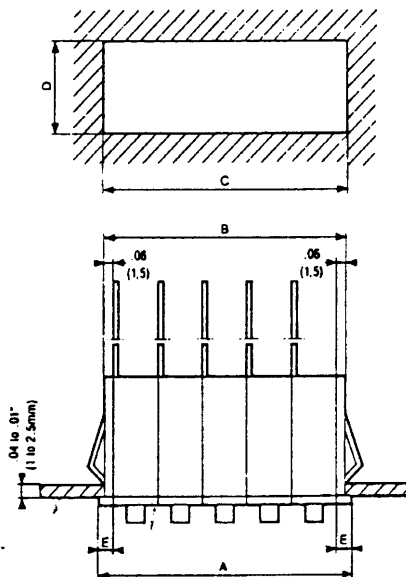
**Mechanical life:**

500,000 operations

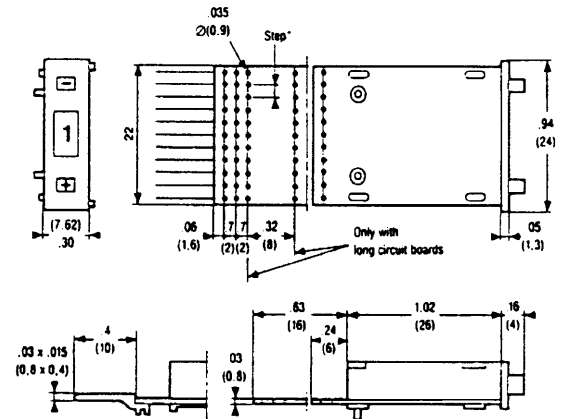
### Materials

**Case and wheel:** polycarbonate  
**Push Buttons and thumbwheel:** Delrin  
**Printed circuit board:** epoxy glass  
**Printed contact:** gold deposit  
**Contacts:** tin plated

### Panel cutout and front face dimensions in inches (mm)



### Dimensions in inches (mm)



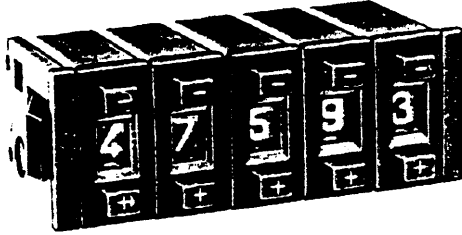
\*Step: .08 (2) – M01, M03, M04, M30  
Step: 1 (2.54) – M29 – M31  
Step: 2 (5.08) – M02 – M07

### Series 84 230

A (.30 x n) + .24 inches	(7.62 x n) + 6mm
B (.30 x n) + .12 inches	(7.62 x n) + 3mm
C (.30 x n) + .14 inches	(7.62 x n) + 3.5mm
D .89 inches	22.5mm
E .12 inches	3mm

# Crouzet® Digital Switches

## Push Button - subminiature - panel mount Series 84 231



- Subminiature size – only .59 inch high
- All modules easily assembled without hardware
- Black wheel standard – white wheel with black markings on request
- Fast, smooth switching action

### Mechanical & Electrical Specifications

**Max. operating voltage:**

switched 50 VAC  
unswitched 120 VAC

**Rated amperage:** switched 1-50mA

**Max. amperage:** unswitched 500mA

**Min. contact resistance:** .1 ohm

**Min. insulation resistance:** 1,000 megohms

**Dielectric strength:**

between tracks: 500 VAC

between tracks and ground: 2,500 VAC

**Operating temperature:**

+ 15°F to + 160°F (–10°C to + 70°C)

**Storage temperature:**

–40°F to + 185°F (–40°C to + 85°C)

**Mechanical life:**

500,000 operations

### Materials

**Case and wheel:** polycarbonate

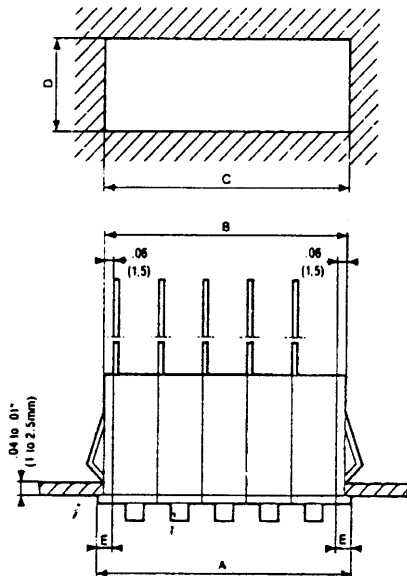
**Push Buttons and thumbwheel:** Delrin

**Printed circuit board:** epoxy glass

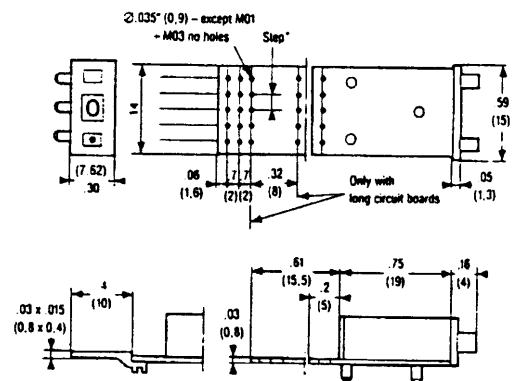
**Printed contact:** gold deposit

**Contacts:** tin plated

### Panel cutout and front face dimensions in inches (mm)



### Dimensions in inches (mm)



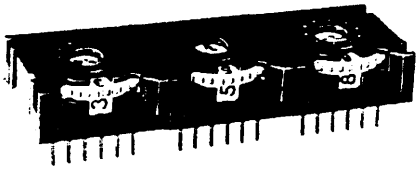
\*Step: .08 (2) – M01  
Step: .1 (2.54) – M02, M03, M04, M07

### Series 84 231

A (.30 x n) + .20 inches	(7.62 x n) + 5.08mm
B (.30 x n) + .12 inches	(7.62 x n) + 3mm
C (.30 x n) + .14 inches	(7.62 x n) + 3.5mm
D .57 inches	14.5mm
E .10 inches	2.54mm

# Crouzet® Digital Switches

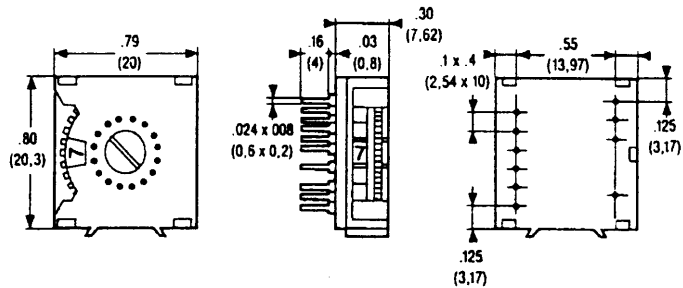
## Thumbwheel - flat PCB mount Series 84 235



- Low profile – specially designed for PCB mounting
- All modules easily assembled without hardware
- Black or red wheels standard – white wheel with black marking on request
- Fast, smooth switching action

Mechanical & Electrical Specifications	Materials
<p><b>Max. operating voltage:</b> 36 VDC/150 VAC</p> <p><b>Rated amperage:</b> switched 1-100mA</p> <p><b>Max. amperage:</b> unswitched 500mA</p> <p><b>Min. contact resistance:</b> .1 ohm</p> <p><b>Min. insulation resistance:</b> 1,000 megohms</p> <p><b>Dielectric strength:</b> between tracks: 500 VAC between tracks and ground: 2,500 VAC</p> <p><b>Operating temperature:</b> + 15°F to + 160°F (-10°C to + 70°C)</p> <p><b>Storage temperature:</b> -40°F to + 185°F (-40°C to + 85°C)</p> <p><b>Mechanical life:</b> 250,000 operations</p>	<p><b>Case and wheel:</b> polycarbonate</p> <p><b>Thumbwheel:</b> Delrin</p> <p><b>Printed circuit board:</b> epoxy glass</p> <p><b>Printed contact:</b> gold deposit</p> <p><b>Contacts:</b> tin plated</p>

### Dimensions in inches (mm)



## Truth Tables - Series 84 230, 84 231, and 84 235

The dots indicate the inter-connected tracks for each of the dial settings.

**B.C.D.**

		M02				
		C	1	2	4	8
Location on PC Board	84 230	10	2	4	6	8
	84 231	5	1	2	3	4
	84 235	7	12	10	8	4
Dial Setting	0	•				
	1	•	•			
	2	•		•		
	3	•	•	•		
	4	•			•	
	5	•	•			•
	6	•		•		•
	7	•	•	•		•
	8	•				•
	9	•	•			•

**B.C.D. + Complement**

		M03								
		C	1	2	4	8	1	2	4	8
		10	2	4	6	8	3	5	7	9
		5	10	9	8	7	1	2	3	4
		2	8	12	11	3	5	1	9	4
		6								
		10								
Dial Setting	0	•					•	•	•	•
	1	•	•					•	•	•
	2	•		•					•	•
	3	•	•	•					•	•
	4	•			•			•	•	•
	5	•	•			•			•	•
	6	•		•					•	•
	7	•	•	•					•	•
	8	•							•	•
	9	•	•						•	•

**B.C.D. Complement**

		M07				
		C	1	2	4	8
		4	2	6	8	10
		5	1	2	3	4
		8	12	10	4	2
		7				
		10				
Dial Setting	0	•	•	•	•	•
	1	•	•	•	•	•
	2	•	•	•	•	•
	3	•	•	•	•	•
	4	•	•	•	•	•
	5	•	•	•	•	•
	6	•	•	•	•	•
	7	•	•	•	•	•
	8	•	•	•	•	•
	9	•	•	•	•	•

**2 Position Repeating**

		M04		
		C	1	2
Location on PC Board	84 230	1	2	11
	84 231	2	3	4
	84 235	7	4	8
Dial Settings (To be specified)	+ 5	•		
	- 0	•	•	
	+ 5	•		
	- 0	•	•	
	+ 5	•		
	- 0	•	•	
	+ 5	•		
	- 0	•	•	
	+ 5	•		
	- 0	•	•	

**Hexadecimal B.C.D.**

		M29				
		C	1	2	4	8
Location on PC Board	84 230	5	4	7	6	8
	84 235	8	12	2	10	4
		7				
Dial Setting	0	•				
	1	•	•			
	2	•		•		
	3	•	•	•		
	4	•			•	
	5	•	•			•
	6	•		•		•
	7	•	•	•		•
	8	•				•
	9	•	•			•
	A	•	•	•		•
	B	•			•	•
	C	•	•			•
	D	•	•	•		•
	E	•				•
	F	•	•			•

**Hexadecimal B.C.D. + Complement**

		M30								
		C	1	2	4	8	1	2	4	8
		10	3	5	9	7	4	2	8	6
		4	10	11	12	8	3	2	1	5
		6								
Dial Setting	0	•					•	•	•	•
	1	•	•					•	•	•
	2	•		•					•	•
	3	•	•	•					•	•
	4	•			•			•	•	•
	5	•	•			•			•	•
	6	•		•					•	•
	7	•	•	•					•	•
	8	•							•	•
	9	•	•						•	•
	A	•	•	•					•	•
	B	•			•				•	•
	C	•	•						•	•
	D	•	•	•					•	•
	E	•							•	•
	F	•	•						•	•

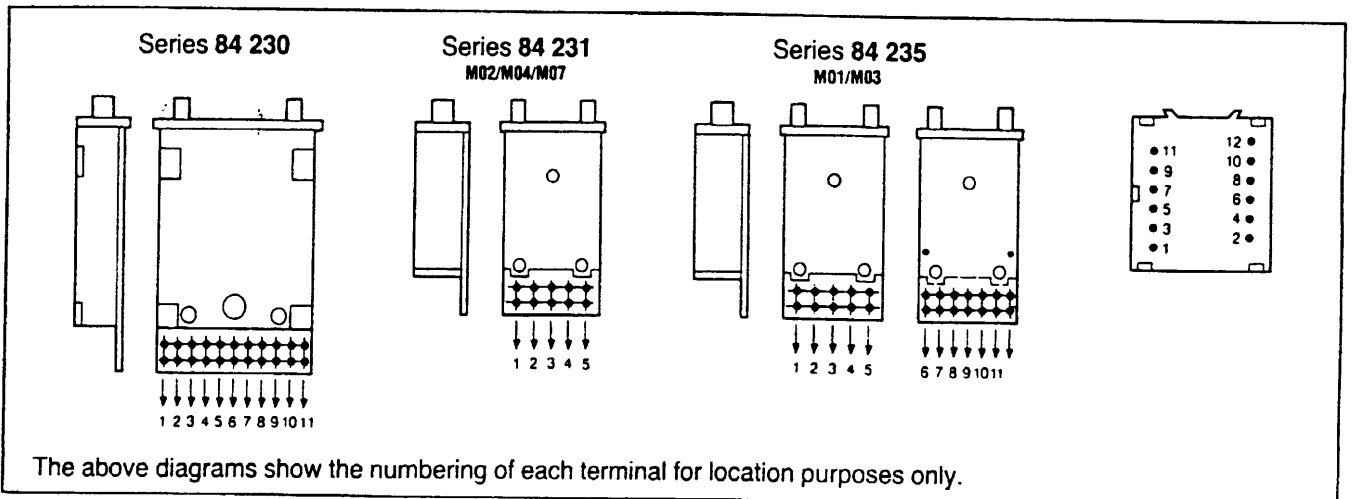
**Hexadecimal B.C.D. Complement Only**

		M31				
		C	1	2	4	8
		8	4	6	7	5
		8	12	2	10	4
		7				
Dial Setting	0	•	•	•	•	•
	1	•	•	•	•	•
	2	•	•	•	•	•
	3	•	•	•	•	•
	4	•	•	•	•	•
	5	•	•	•	•	•
	6	•	•	•	•	•
	7	•	•	•	•	•
	8	•	•	•	•	•
	9	•	•	•	•	•

**Decimal**

		M01										
		C	0	1	2	3	4	5	6	7	8	9
Location on PC Board	84 230	1	11	2	3	4	5	6	7	8	9	10
	84 231	9	6	1	11	2	10	3	8	4	7	5
	84 235	7	5	12	11	10	9	8	1	2	3	4
		6										
Dial Setting	0	•	•									
	1	•		•								
	2	•			•							
	3	•				•						
	4	•					•					
	5	•						•				
	6	•							•			
	7	•								•		
	8	•									•	
	9	•										•

### Terminal Configuration



Please consult us for special codes.

## How to Order

Example of order: **Thumbwheel** **84 210** **M02** **L** **N** **R** **S** **4-6**

1 - Description \_\_\_\_\_  
 Rocker  
 Thumbwheel ✓  
 Push Button

2 - Series \_\_\_\_\_  
 ✓ 84 210 84 213 84 230  
 84 211 84 214 84 231  
 84 212 84 218 84 235

3 - Code Definition \_\_\_\_\_  
 - Decimal ..... M 01  
 - Binary BCD 1-2-4-8 ..... M 02 ✓  
 - Binary BCD 1-2-4-8 + complement ..... M 03  
 - 2 position repeating (+/-) or (0/5) ..... M 04  
 - BCD complement ..... M 07  
 - BCD excess 6 + complement ..... M 08  
 - Hexadecimal BCD\* ..... M 29  
 - Hexadecimal BCD + complement\*\* ..... M 30  
 - Hexadecimal BCD complement\*\* ..... M 31  
 \*84 210, 84 230, 84 235 only  
 \*\*84 230 and 84 235 only

4 - Circuit Board \_\_\_\_\_  
 - Short (standard): C  
 - Long: ✓ ..... L ✓

5 - Case Color \_\_\_\_\_  
 - Black: (standard) .... N ✓  
 - Grey: (optional) ..... G

6 - Wheel Color \_\_\_\_\_  
 - Black: (standard) .... N  
 - Red: (standard) ..... R ✓  
 - Yellow: (optional) .... J  
 - Green: (optional) .... V  
 - Blue: (optional) ..... R

7 - Terminations \_\_\_\_\_  
 - Standard: Solder terminals ✓ ..... S ✓  
 - Other: For wire wrap ..... X2  
 Pins for PC board soldering ..... X3  
 Connector (see accessories) ..... S

8 - Mechanical stops (to be specified only when a limited setting range is required) \_\_\_\_\_  
 - Indicate the 1st and last positions  
 e.g. possible positions: 4-5-6 ✓  
 blocked positions: 7-8-9-0-1-2-3

**Above example to be read as:**

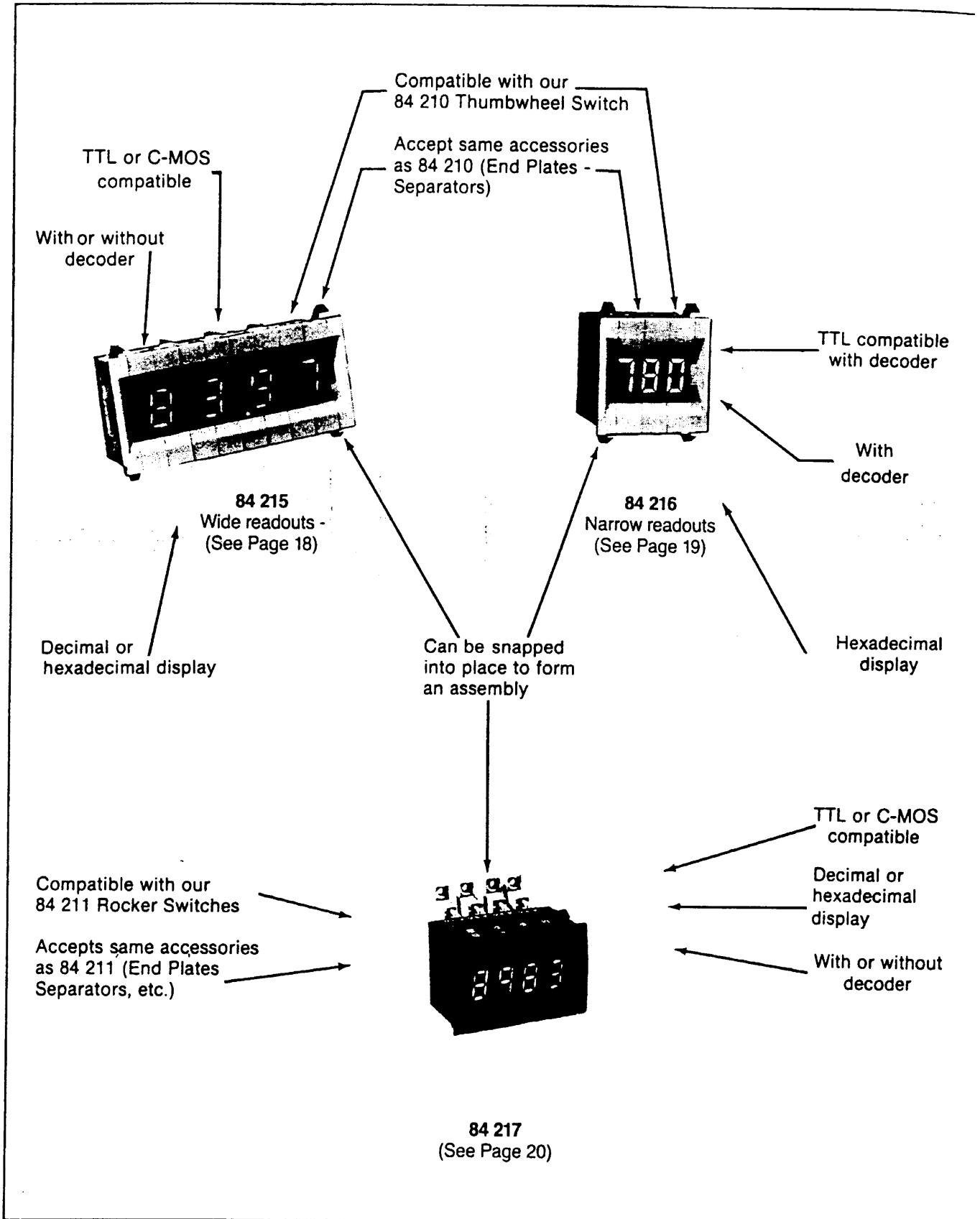
- 1 - Thumbwheel switch
- 2 - 84 210
- 3 - binary BCD 1-2-4-8 - M 02
- 4 - Long circuit board
- 5 - Black case
- 6 - Red wheel
- 7 - Standard solder terminals
- 8 - Possible positions 4-5-6

**ACCESSORIES (see page 2)**  
 (specify digital switch series number)

- **Pair of End Caps including Clips. JE/**  
 (color: N - black: standard G - grey: optional)
- **Spacer: MI**
- **Encoded "Dummy" Module: MC** - also specify code, circuit board, color connections
- **Separator including Clips: MS**
- **Connector for Plugging of Circuit C:**  
 CR/W2-Solder Terminals  
 CR/X2-Wire Wrapping Terminals  
 CR/X3-PC Board Pins

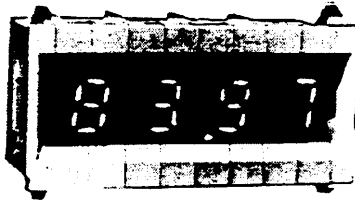
# **Crouzet**® Digital Switches

## L.E.D. Readouts - 3 main families





## L.E.D. Readouts - wide readout - panel mount Series 84 215



- The L.E.D. readout modules type 84 215 can work alongside our Thumbwheel switches, 84 210 Series.
- The same accessories (end plates, separators, etc.) can be used. This allows the assembly of counting and programming systems, offering a consistent design in a small size.
- As with our Thumbwheel switches, these modules can be snapped into place to form an assembly.
- Choice of decoders (TTL or C-MOS), memory, voltages.
- Three versions are available.

### Common Specifications

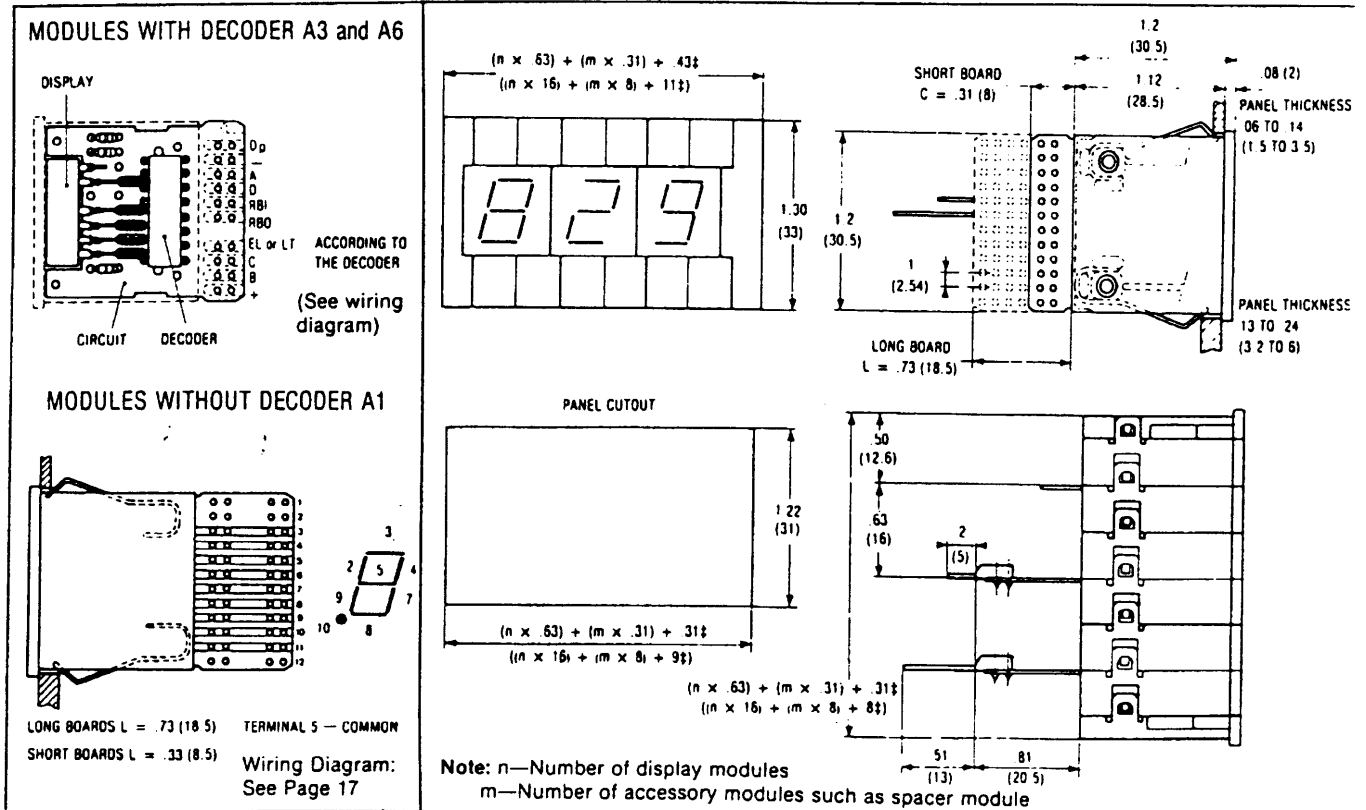
<b>Figure Height:</b> .433 in. (11 mm)	<b>Current Per Segment:</b> 7 mA
<b>Module Width:</b> .62 in. (16 mm)	<b>Display:</b> H.P. 5082 - 7653
<b>Color:</b> Red	<b>RBI - RBO output on all modules</b>
<b>Operating Temperature:</b> +32° F to +140° F. (0° C. to 60° C.)	(except A1)
<b>Case Color:</b> Black (standard) or grey (upon request)	<b>Common Cathode</b>

### Particular Specifications

Code	BCD Decoder		LT Output (Lamp Test)	EL Output (Memory)	Position of Decimal Point		Typical Consumption of Decoder at 75° F (25° C)	Voltages Available	Type of Display
	C-MOS	TTL			Left	Right			
A1	No	No	Yes	No		•	N.A.	5 V (standard) 12-15-24 V (on request)	According to User's decoder
A3	MM74 C48	No	Yes	No		•	0.05 μA	5 V (standard) 12-15 V (on request)	Decimal
A6	No	9368	No	Yes		•	45 mA	5 V	Hexadecimal

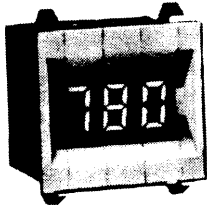
### Terminations

### Dimensions in inches (mm)



# L.E.D. Readout Modules

L.E.D. Readouts - narrow readout - panel mount Series 84 216



## With Memory

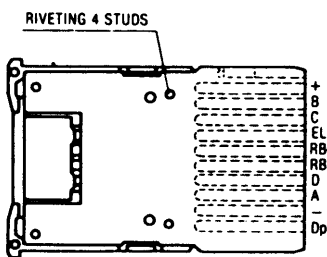
- The L.E.D. readout modules type 84 216 can be mounted together with the 84 215 L.E.D and/or 84 210 Thumbwheel.
- Therefore, the same accessories (end plates and separators) are used.
- The thickness of these modules is .31 in. (8 mm)
- The clip mounting offers a consistent design in a small size.
- Snap on assembly requires no hardware.
- Our modules are equipped with a decoder BCD compatible with TTL technology.

## Specifications

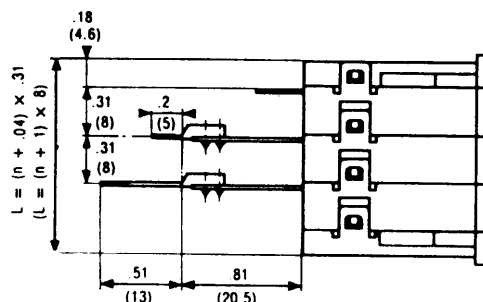
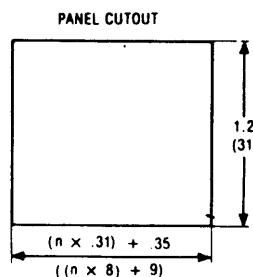
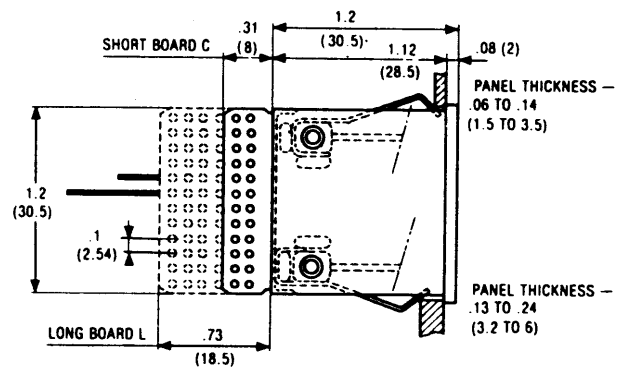
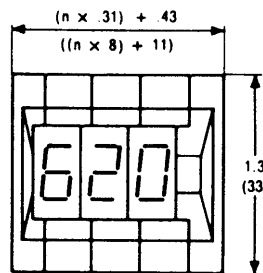
**Voltage:** 5 V  
**Current:** 16 to 22 mA per segment  
**Decoding:** BCD with TTL technology (decoder 9368)  
**Display:** 7 segment L.E.D. (Fairchild)  
**Figure Height:** .35 in. (9 mm)  
**Module Width:** .31 in. (8 mm)  
**Color:** Red  
**Case Color:** Black (standard) or grey (upon request)  
**Operating Temperature:** +32° F. to +95° F. (0° C to +35° C.)

**EL (Enable Latch) output**  
**RBI - RBO outputs**  
**Decoder Consumption at 75° F. (25° C) =**  
 45 mA  
**Common Cathode**  
**Hexadecimal Display**  
**Position of Decimal Point:** right

## Terminations



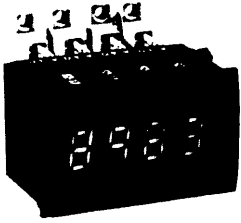
## Dimensions in inches (mm)



Wiring Diagram  
See Page 21

# L.E.D. Readout Modules

## L.E.D. Readouts - panel mount Series 84 217 - compatible with Rocker Switches



- The L.E.D. readout modules type 84 217 can be mounted together with our 84 211 Rocker switches.
- The same accessories (end plates, separators, etc.) can be used.
- As with our Rocker switches, these modules can be snapped into place to form an assembly.
- Choice of decoders, (TTL or C-MOS), memory (EL), voltages etc.
- Six versions are available.

### Common Specifications

**Figure Height:** .39 in (10 mm)  
**Module Width:** .39 in (10 mm)  
**Color:** Orange  
**Operating Temperature:** +32° F to +140° F. (0° C. to 60° C.)  
**Case Color:** Black (standard) or grey (upon request)

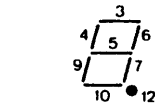
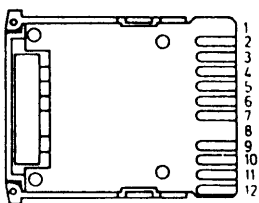
**Current Per Segment:** 7 mA  
**Display:** MAN 4640 (except 84 217-A11: MAN 4605)  
**Common Cathode**  
**Position of Decimal Point:** right

### Particular Specifications

Code	BCD Decoder		LT Output (Lamp Test)	EL Output (Memory)	RBI-RBO Outputs	Typical Consumption of Decoder at 75° F. (25° C.)	Voltages Available	Type of Display
	C-MOS	TTL						
A1	No Decoder	No Decoder	No	No	No	Not Applicable	5 V (standard) 12-15-24 V (on request)	Depends upon User's Decoder
A3	MM 74C48		Yes	No	Yes	0.05 $\mu$ A	5 V (standard) 12-15 V (on request)	Decimal
A6		9368	No	Yes	Yes	45 mA	5 V	Decimal
A8	MC 14511		Yes	Yes	No	0.015 $\mu$ A	5 V (standard) 12-15-24 V (on request)	Decimal
A10	MC 14495		No	Yes	No	0.05 $\mu$ A	5 V (standard) 12-15-24 V (on request)	Hexadecimal
A11	MC 14511		Yes	Yes	No	0.015 $\mu$ A	5 V (standard) 12-15-24 V (on request)	$\pm 1$

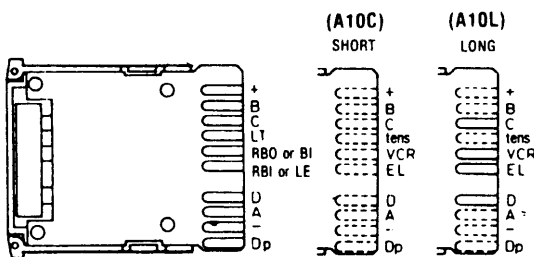
### Terminations

#### MODULES WITHOUT DECODER A1



Common: Terminal 11

#### MODULES WITH DECODER (A2 to A8 and A11)

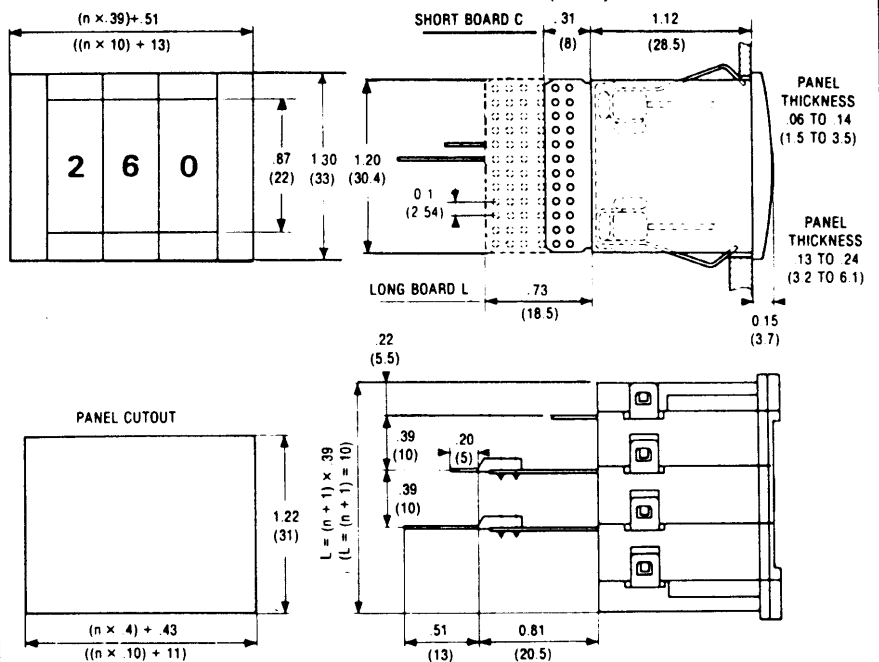


Wiring Diagram: See Page 21

ACCORDING TO THE DECODER

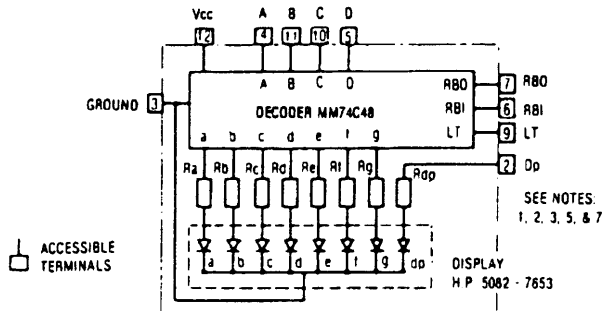
(SEE WIRING DIAGRAM)

### Dimensions in inches (mm)

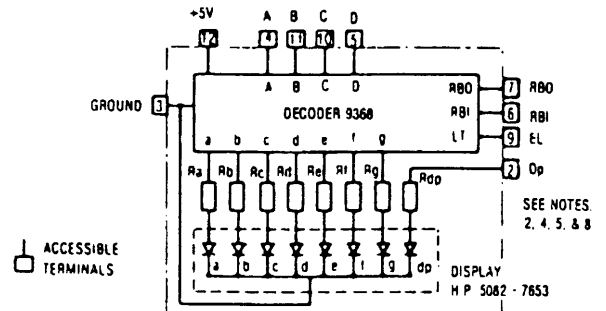


## L.E.D. Readouts - Wiring Diagrams

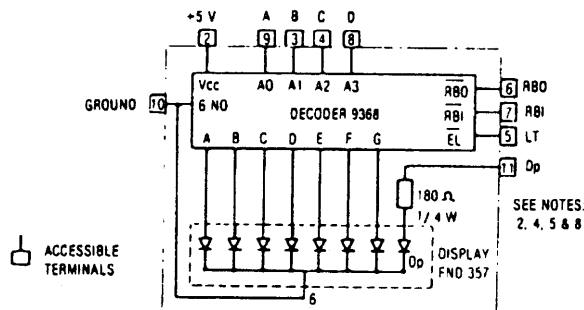
84 215 - A3



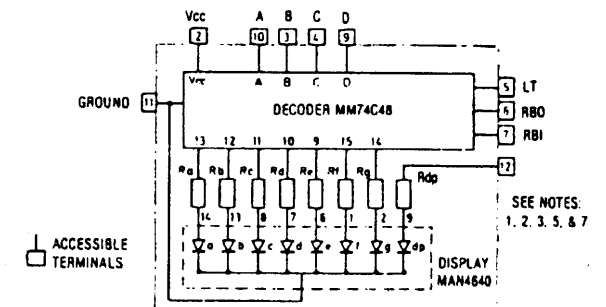
84 215 - A6



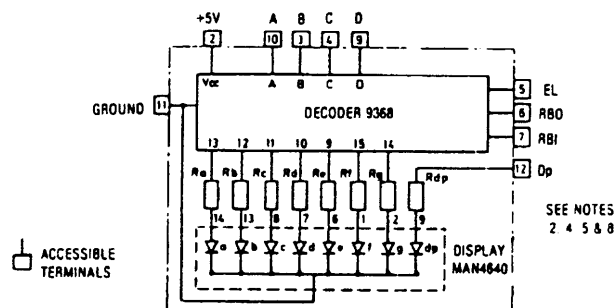
84 216



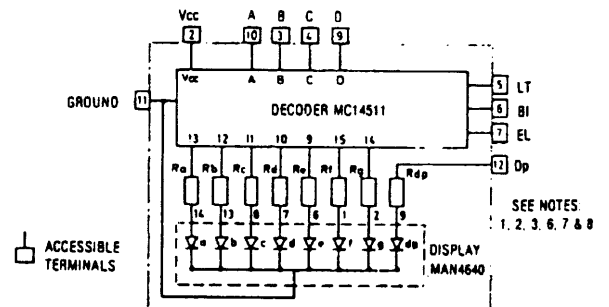
84 217 - A3



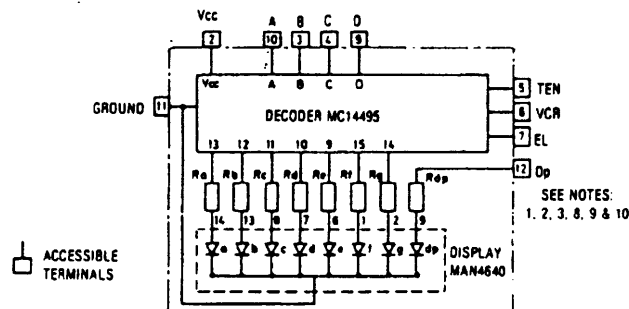
84 217 - A6



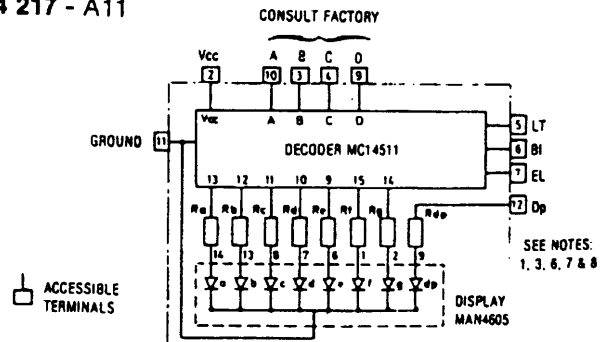
84 217 - A8



84 217 - A10



84 217 - A11

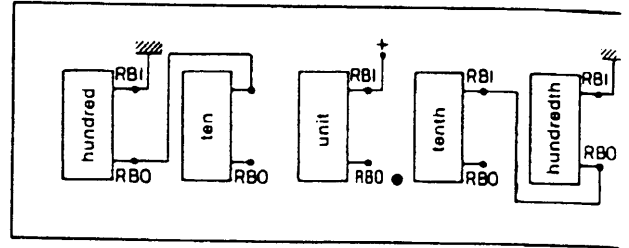


## L.E.D. Readouts - Wiring Diagrams

### Notes:

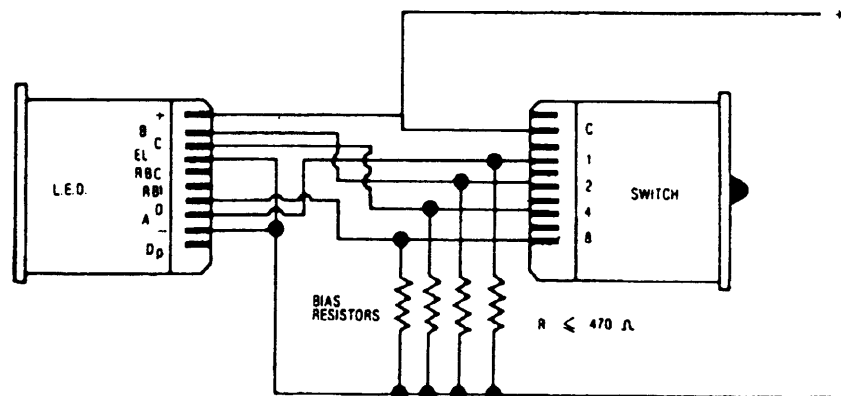
1. Vcc = 5, 12, 15 or 24 V according to the model (5 V standard - 12, 15 and 24 V on request).
2. A, B, C and D correspond respectively to 1, 2, 4 and 8 of BCD code.
3. In all C-MOS decoders, it is mandatory that all inputs be connected at ALL times either to the + or the ground (except RBI-RBO - see note 5). The use of bias resistors is therefore necessary (see diagram). Should an input not be used at all, it may be directly connected either to the + or the ground (depending on the function).
4. For TTL decoders, should an input not be connected to either the + or the ground, the decoder might not work properly (while not connected), but it would not be destroyed.
5. The non-significant zeros are cancelled when RBI (Ripple Blanking Input) is connected to the ground, if several modules are connected together the RBI of the module adjacent to the module of the units (eg: ten or tenth) must be connected to the RBO (Ripple Blanking Output) of the next unit (hundred or hundredth) etc. The first RBO's (ten and tenth) as well as the unit's are left unconnected. (the zero of the unit is never cancelled).

If the zero cancellation is not required, the RBI inputs must be connected to the + of the power supply and RBO must be left unconnected.



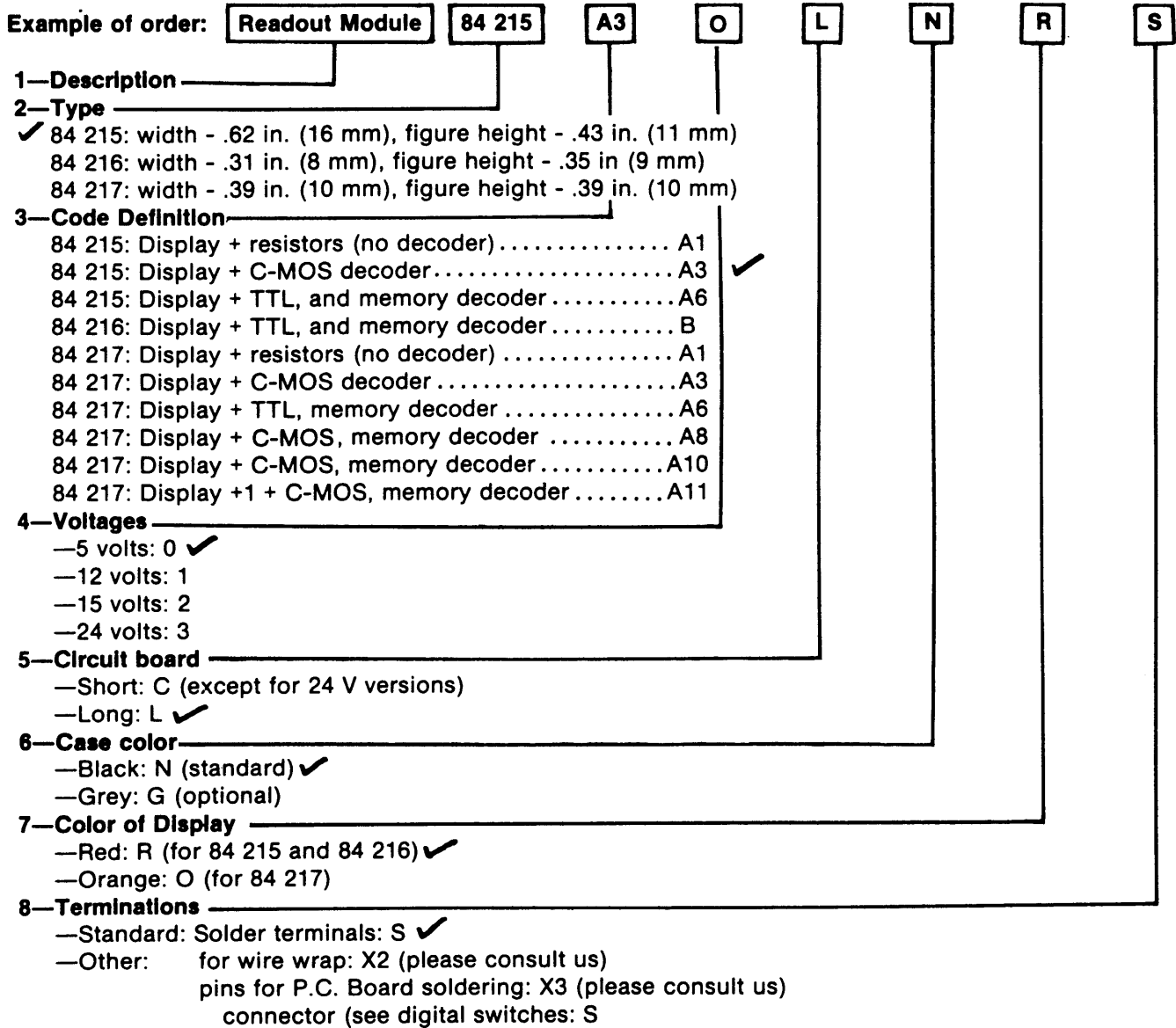
6. Connecting BI (Blanking Input) to the ground cancels the display (otherwise connect BI to + of supply)
7. Connecting LT (Lamp Test) input to ground makes possible to control all segments (otherwise connect to + of supply).
8. Connecting EL (Enable Latch) to + of supply keeps display in memory. Otherwise connect EL to ground.
9. TEN output is in state "0" when digits from 0 to 9 displayed and in state "1" when digits from A to F displayed.
10. VCR output is open for displays from 0 to E. When displayed the state is "0".

### Example of Control of a Readout Module with a Thumbwheel Switch.



# Digital Switches

## L.E.D. Readouts - How to Order



**Above example to be read as:**

- 1—Readout module
- 2—84 215 - width .62 in. (16 mm); figure height .43 in. (11 mm)
- 3—C-MOS decoder
- 4—5 volts
- 5—Long circuit board
- 6—Black case
- 7—Red display
- 8—Standard solder terminals