4 DIGIT UP/DOWN COUNTER/TIMER
Frequency, Event, Elapse, Lap
"Flat Pack" No Panel Cut Out Required
(NEMA 3 or NEMA 4X)

MODEL 413

FLAT PACK

Features
• No Panel Cut-Out Required
• Three Mode Operation: Lap, Elapsed & Total
• Start/Stop Debounced Input.
• Cascadable
• Bright 0.6" Red LED's
• 9999 or 59:59 Display Format
• Programmable Time Base
• MTBFC: 100,000 Hours

SANITARY

SPECIFICATIONS AT 25°C

Display .... 4 Digit .6" Red LED 9999 or 59:59
MTBF .... 100,000 Hours
Power .... 200mA at 5VDC
Input Signals .... TTL/CMOS (5V)
Input Frequency (Freq. Meter) .... DC to 1MHz
Frequency Response (Counter) .... DC to 2MHz
Operating Temperature .... -10° to +60°C
Storage Temperature .... -20° to +70°C
Count Pulse Width .... >250nS
Input Impedance 100Kohms/27pF
Input Count Level (blue) .... 1 to 150V Peak
Sanitary Case .... NEMA 4X up to 250?F Steam Cleaning

DESCRIPTION: The **413** is a frequency meter, timer or counter. In the frequency and timer mode, the time base is selected by two microswitches (see table). SW2 selects one of eight primary frequencies, SW1 divides the selected primary frequency from 1 to 10 million in steps of 10. In the frequency mode, the time base is normally set for 1Hz to give direct reading in Hz with 1Hz resolution. If the time base is set at 0.0166Hz then the 413 becomes an RPM meter. In the timer/clock operation there are two modes: 2 step timer mode (1st pulse, run; 2nd pulse, stop & clear), 3 step timer/clock mode (1st pulse, run; 2nd pulse, stop; 3rd pulse, clear). The run/stop input is debounced, (after it receives the first pulse at this terminal, it will not accept any other pulses for a period of about 0.5 sec. (others on request). In the counter mode the 413 will add or subtract any pulse from 1 volt to 150 volts in amplitude and up to 2MHz. On power-up, the 413 is reset until a pulse in run/stop terminal is received. Colon (:) is standard on clock formats, D.P. (X.XXX or XX.XX) must be specified if required. To cascade two 413's, simply connect the carry-borrow of the master to the count input of the slave.

HOUSING: Otek's Flat Pack requires no panel cut out. Just drill a 10mm (3/8") ? ?hole, pass the wires through, attach the provided double-sided tape (to prevent rotation), align the flat pack, tighten the nut and make the connections to the wires. No connector or tools required! No behind the panel space needed! The case is U.L. approved ABS Polycarbonate 94VO rated. **NEMA 4X housing option does not have access to the adjustments (Counter function does not apply). If other than Otek's standard setting is required, please specify at the time of ordering.** Our New **Sanitary Case** is wall, pipe or panel mount and can include up to 2 meters, please specify**!**

POWER SUPPLIES: Externally mounted. Two types are available, the "Open Frame" style accepts 120/240VAC and delivers 5VDC at up to 400mADC. The "Power Pack" is a wall plug in module available only for 120VAC input and delivers 5VDC at up to 200mADC.

LEAD

COLOR	TERMINAL DESCRIPTION
WHITE	**RUN/STOP:** Falling edge triggerable, will command the 413 to stop or start the count/time. This terminal has a 10K pull up and is debounced for about 500mS. Do not use in freq. mode.
BLUE	**COUNT-IN:** In the timer mode, connect to Orange . In frequency/counter modes this will be the + input terminal.
VIOLET	**COUNTER HOLD:** Connect to Red for normal operation. Connect to Black to hold the count. This terminal is not debounced, undesired pulses will affect the counting.
RED	**VCC:** Connect to a +5VDC capable of supplying 200mA.
GREEN	**DISPLAY HOLD:** Do not use in freq. mode. In timer/counter modes the 413 will hold the display (not the count) when left open. Connect to Black for normal operation or to up-date the display.
BLACK	**GROUND:** VCC return path and - input.
ORANGE	**FREQUENCY OUT:** Selected time base output. Connect to Blue for timer mode. Do not use it for freq. mode.
YELLOW	**RESET:** To reset counter/timer, connect to Black. (Green should be connected to Black to clear the display). In frequency mode this terminal is not used (leave it open)
BROWN	**UP/DOWN:** In the timer/counter modes, leave it open to count up (after 9999 (59:59) counter will go to 0000), or connect to Black to count down (after 0000 counter will go to 9999 (59:59)).
GRAY	**CARRY/BORROW:** This terminal is used to connect two or more 413's in cascade. It will generate a pulse at 9999 > 0000 > 9999.

ORDERING INFORMATION

MODEL: 4 1 3 - [1][2][3]-[0][5]

FUNCTION
0 .... Counter (9999)
1 . Clock 2 Step (59:59)
2 . Clock 3 Steps(59:59)
3 .... Frequency (9999)
4 ..Timer 2 Step (9999)
5 . Timer 3 Steps(9999)

RANGE/CALIBRATION
0 .... Standard
9 .... Custom

POWER INPUT (3)
0 .... 5VDC
1 .... 120/240VAC
2 .... 120VAC

HOUSING(1,2)
0....NEMA 3(IP53)
1....NEMA 4X(IP65) **(2)**
2....Sanitary **(3)**

10/8/08

NOTES:
1. NEMA 4X does not have external adjustments. Factory adjusted per customer specs.
2.1 Meter Per Housing. For 2/Housing Add $25 ($175)
3. 120/240VAC means open frame P.S. 120VAC is wall mount P.S. (power pack).

COUNTERS,TIMERS,RATE

SANITARY CASE

Front View

ø0.3500 (4 plcs)

7.00 6.15 | 4.18 | 4.18 | 6.25

Side View

1.78 | 2.25 | 1.78

6.15 | 7.00 | 3.50

3.65

1.15

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413 FLAT PACK MECHANICALS & TYPICAL CONNECTIONS
FLAT PACK W/WIRES

1.520
1.225
.570
SW2
3/8-16
.600
.720
2.040
1.020
.330
SW1
.260
1.13
6.000 MIN.
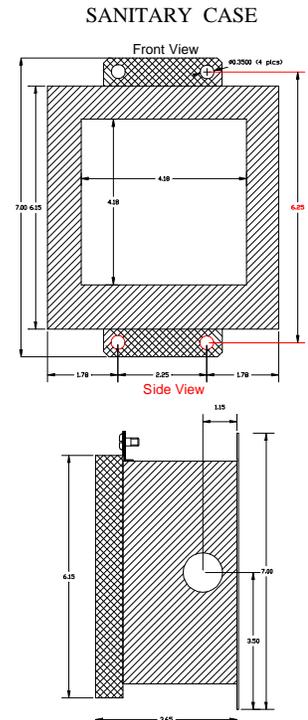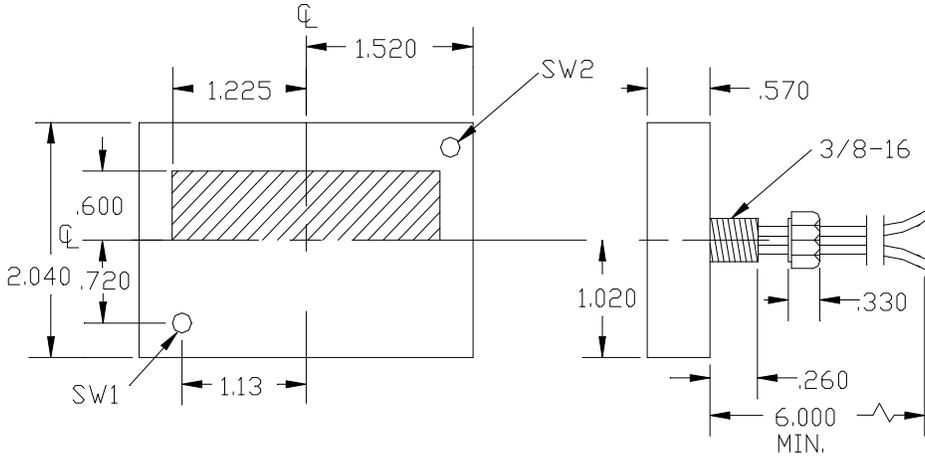
MECHANICALS FOR POWER SUPPLIES

OPEN FRAME STYLE
P/N 81-3110, 5VDC OUTPUT

2.845
.200
.200
2.200
C2
VR1
T1
2.575
DIA. .125
.130
.156
.200
6   1
.230
.375
1.225   1.090
.200
2.795

SIDE VIEW

.80
1.50
C2
.062
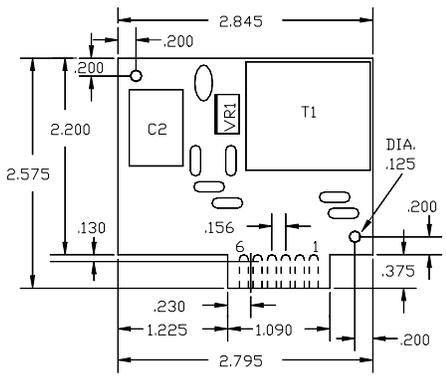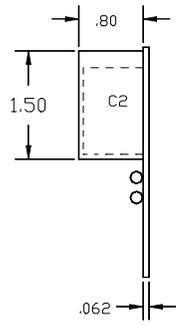
OPEN FRAME
POWER SUPPLY
TYPICAL CONNECTIONS

INPUTS
1
2   120 VAC
3
4

1
2   240 VAC
3
4

OUTPUTS   P/N 81-3110, 5VDC OUT
5 -GROUND
6 +VCC

POWER PACK STYLE

120 VAC
2.200   5VDC
+   -

1.700   2.050

ORDER P/N 75-3110 FOR 5VDC
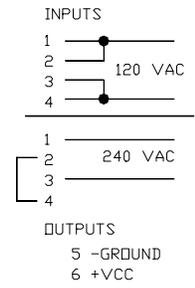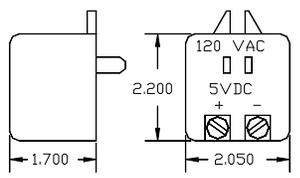
TIME BASE SELECTION

SW1 →	0	1	2	3	4	5	6	7
SW2	KHZ	KHZ	KHZ	HZ	HZ	HZ	HZ	HZ
0	1MHZ	100	10	1000	100	10	1.0	0.1
1	100KHZ	10	1.0	100	10	1.0	0.1	.01
2	500KHZ	50	5.0	500	50	5.0	0.5	.05
3	333.3KHZ	33.33	3.333	333.3	33.33	3.333	.3333	.0333
4	250KHZ	25	2.5	250	25	2.5	0.25	.025
5	200KHZ	20	2.0	200	20	2.0	0.2	.02
6	166.6KHZ	16.66	1.666	166.6	16.66	1.666	.1666	.0166
7	83.3KHZ	8.33	0.833	83.3	8.33	.833	.0833	.00833

CHART NOTE: POS. 8 & 9
ARE THE SAME AS 0 & 1.

F#87MC413.DWG

TYPICAL CONNECTIONS
CLOCK/TIMER MODE (4131)

+5V
RED 4
─┐T┌─ *
├─T─┤ *
1
RUN/   WHT   FREQ. OUT
HOLD   7 OR
8   2 BLUE
RESET   YEL   COUNT IN
9
3 VIO   COUNTER
UP/DW   BRN   HOLD
5
GRN   10 GRY
DISPLAY   CARRY/BORROW
HOLD   BLK 6

* 4130 TERMINAL
IS RUN/STOP
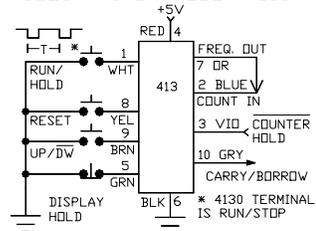
NOTE: FOR COUNTER (4130)
Pin AT PN 2/BLUE.
(7/ORANGE IS NOT USED)

FOR FREQ. (4133)
Pin AT PIN 2/BLUE
(OTHER PINS ARE NOT USED)