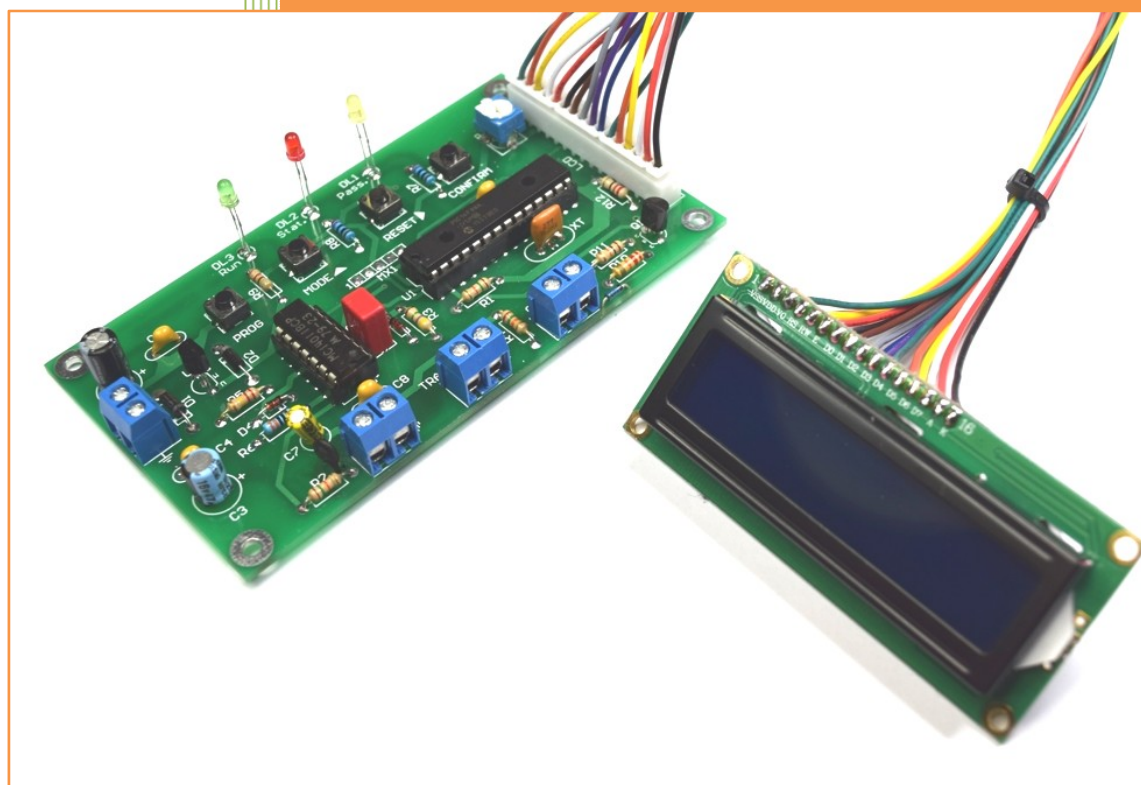




SERVICE MANUAL
MANUALE TECNICO

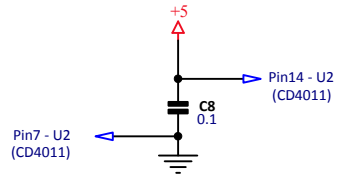
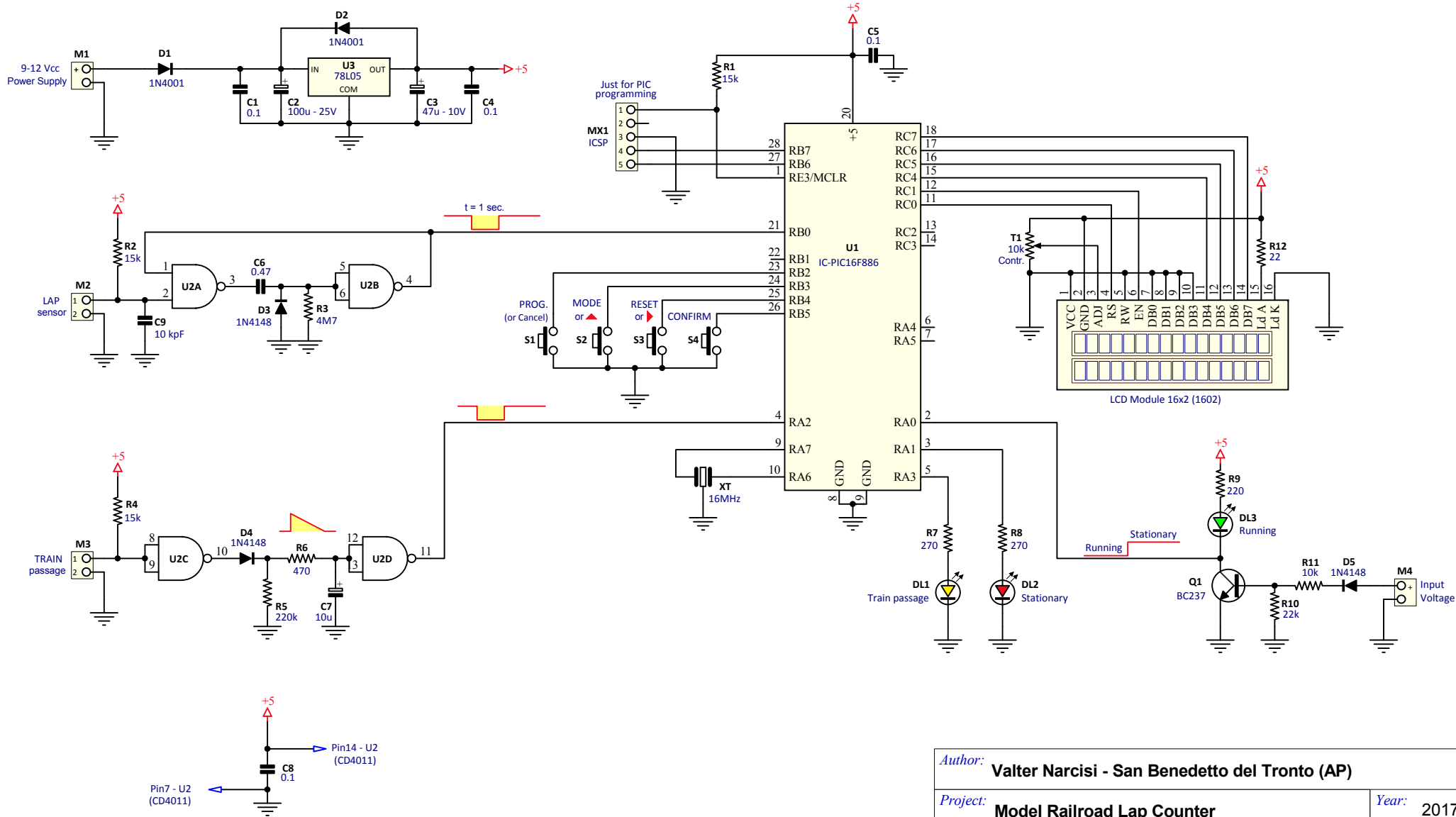
LAP COUNTER for MODEL RAILROAD



A1

CONTAGIRI PER MODELLISMO
con MICROCONTROLORE
PIC16F886

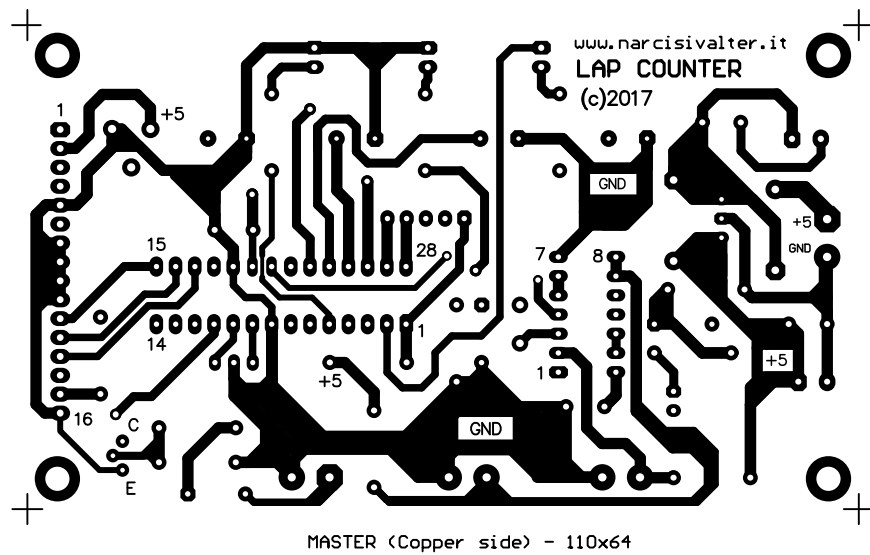
©2017 by Valter Narcisi
www.narcisivalter.it

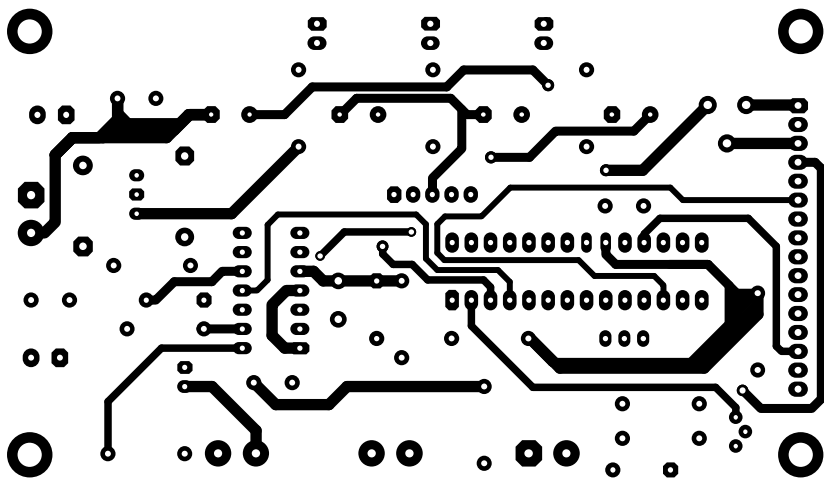


Author: **Valter Narcisi - San Benedetto del Tronto (AP)**
 Project: **Model Railroad Lap Counter** Year: 2017
 Size: A4 DWG no. 1 Rev.: 2 Scale: 1:1 Sheet: 1 of 1
 Note: <http://www.narcisivalter.it/progetti/model-lap-counter.html>

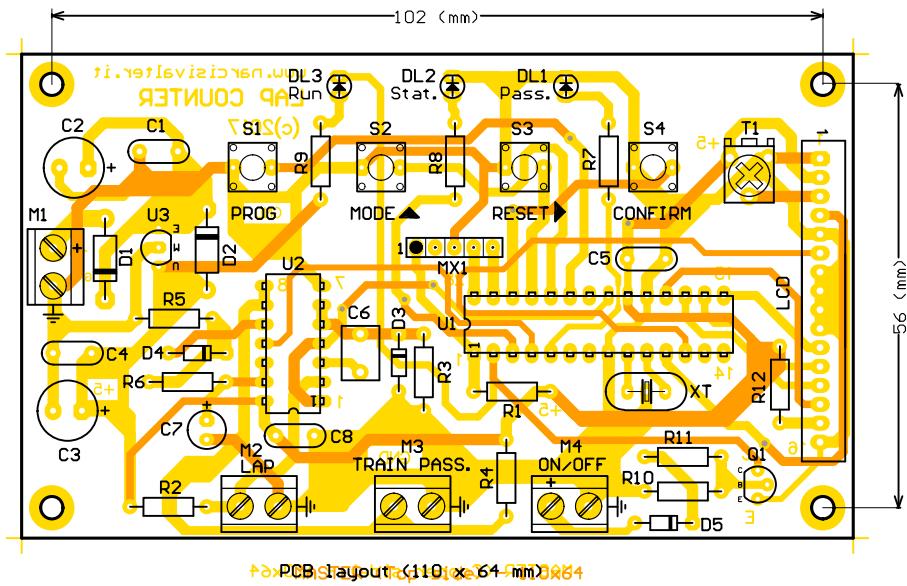
ELENCO COMPONENTI - COMPONENTS LIST

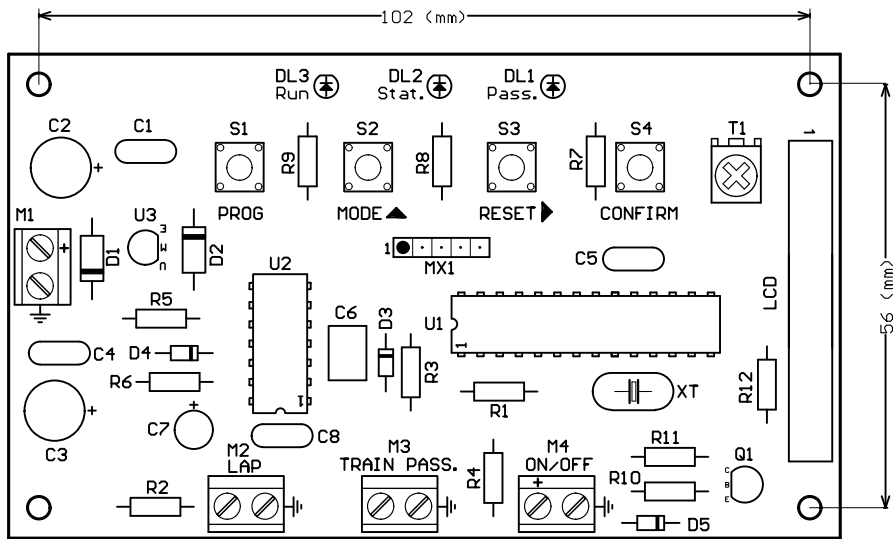
<i>Designator</i>	<i>Component description</i>
C1-C4-C5-C8	0.1u
C2	100u - 25V
C3	47u - 10V
C6	0.47
C7	10u
C9	0.01u
R1-R2-R4	15k
R3	3M3
R5	220k
R6	4k7
R7-R8	270 ohm
R9	220 ohm
R10	22k
R11	10k
R12	22 ohm
D1-D2	1N4001
D3-D4-D5	1N4148
D4	1N4148
DL1	LED Yellow 3mm (Train passage)
DL2	LED Red 3mm (Stationary)
DL3	LED Green (Running)
Q1	Transistor NPN BC237
U1	PIC16F886 Microcontroller
U2	CD4011
U3	78L05 (100 mA)
LCD	LCD Module 16x2 (1602)
T1	10k trimmer (LCD contrast)
XT	16MHz 3-pin Resonator
S1	Tactile Switch (Prog)
S2	Tactile Switch (MODE)
S3	Tactile Switch (RESET)
S4	Tactile Switch (CONFIRM)
M1	2-Way Screw Terminal (Power Supply)
M2	2-Way Screw Terminal (LAP)
M3	2-Way Screw Terminal (TRAIN PASS.)
M4	2-Way Screw Terminal (ON/OFF)
MX1	5-Way strip 2.54 (ICSP)





MASTER (Top side) - 110x64





PCB layout (110 x 64 mm)

