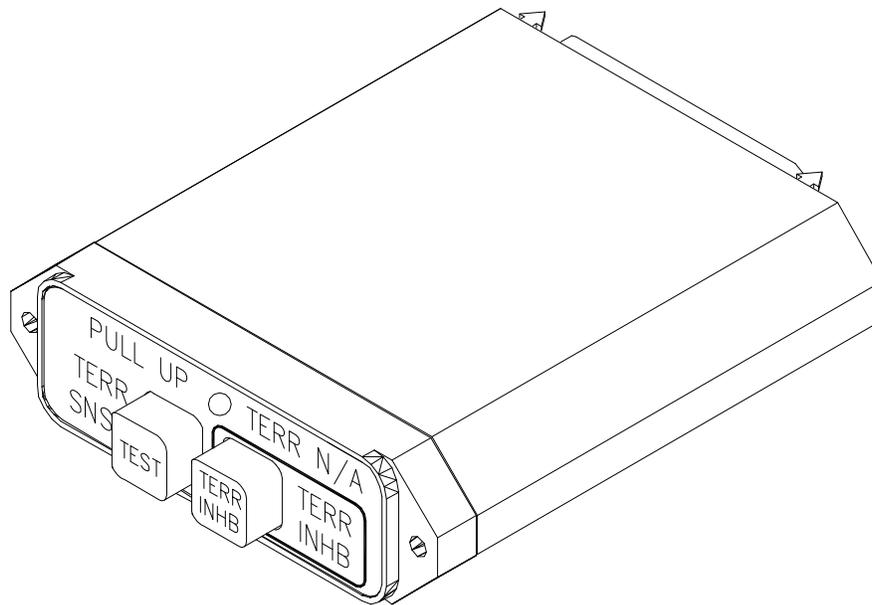




## INSTALLATION MANUAL AND OPERATING INSTRUCTIONS

### MD41-11XX SERIES TERRAIN AWARENESS ANNUNCIATION CONTROL UNIT for L-3 COMMUNICATIONS TAWS8000 and TAWS8100

MD41-1124	14vdc	Horizontal Mount
MD41-1134	14vdc	Vertical Mount (shown on page 9)
MD41-1128	28vdc	Horizontal Mount
MD41-1138	28vdc	Vertical Mount (shown on page 9)



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### Revisions

<b>Rev.</b>	<b>Date</b>	<b>Description of Change</b>	<b>Approved</b>
A	09/29/04	Changed manufacture to L-3 Communications, added TAWS8100	BB
B	07/02/12	Removed schematics, Figure 3.5	BAW

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## SECTION 1 GENERAL DESCRIPTION

### 1.1 INTRODUCTION

The MD41-11XX series is a compact, self-contained Annunciation and Control unit. The fully integrated, control unit provides annunciation and mode selection for the Landmark Terrain Awareness Warning System (TAWS) manufactured by L-3 Communications. It combines all the necessary functions required to interface TAWS systems for FAA approval.

Other features include dual 20,000 hour lamps used for all annunciations, internally lighted selection switches and choice of manual or automatic photocell dimming. A external annunciation dimming adjustment is provided for balancing low level light conditions.

### 1.2 SPECIFICATIONS, TECHNICAL

#### 1.2.1 PHYSICAL CHARACTERISTICS

Mounting:	Panel
Width:	3.25 Inches
Height:	0.80 Inches
Depth:	3.20 Inches
Weight:	0.50 lbs.

#### 1.2.2 ENVIRONMENTAL CHARACTERISTICS

PMA Compliance:	PQ3738CE
Applicable Documents:	RTCA DO-160C
Operating Temperature Range:	-55°C to +70°C
Humidity:	95% Non-Condensing
Altitude Range:	0 to 55,000 ft.
Vibration:	Cat. M and N
Operational Shock:	Rigid Mounting, 6 G Operational 15 G Crash Safety

### 1.2.3 SPECIFICATIONS, ELECTRICAL

Design	All Solid State
MD41-1124, -1134	0.30 Amps
MD41-1128, -1138	0.40 Amps
MD41-1128(5V), -1138(5V)	0.42 Amps

### 1.2.4 FRONT PANEL CONTROLS AND ANNUNCIATIONS

#### 1.2.4.1 CONTROLS

TEST	Momentary switch, when pressed, will activate the TAWS computer self-test.
TERR/INHB	Momentary switch, when pressed, will place the TAWS computer in standby mode.

#### 1.2.4.2 ANNUNCIATIONS

TERR/NA	Terrain information is not available.
TERR	Terrain is very near or above the aircraft altitude.
PULL UP	Terrain is well above aircraft altitude.
TERR/ INHB	TAWS system has been placed in standby mode.
SENSOR	Indicates failure of the remote TAWS unit.

## **SECTION 2 INSTALLATION CONSIDERATIONS**

### **2.1 COOLING**

No direct cooling is required. As with any electronic equipment, overall reliability may be increased if the MD41-11XX series is not located near any high heat source or crowded next to other equipment. Means of providing a gentle air flow will be a plus.

### **2.2 EQUIPMENT LOCATION**

The MD41-11XX series must be mounted as close to the pilot's field of view as possible. Please reference the TAWS installation manual for approved locations. The unit depth, with connector attached, must also be taken into consideration.

### **2.3 ROUTING OF CABLES**

Care must be taken not to bundle the MD41-11XX logic and low level signal lines with any high energy sources. Examples of these sources include 400 HZ AC, Comm, DME, HF and transponder transmitter coax. Always use shielded wire when shown on the installation print. Avoid sharp bends in cabling and routing near aircraft control cables.

## SECTION 3 INSTALLATION PROCEDURES

### 3.1 GENERAL INFORMATION

This section contains interconnect diagrams, mounting dimensions and other information pertaining to the installation of the MD41-11XX. After installation of cabling and before installation of the equipment, ensure that power is applied only to the pins specified in the interconnect diagram.

### 3.2 UNPACKING AND INSPECTING EQUIPMENT

When unpacking equipment, make a visual inspection for evidence of damage incurred during shipment. The following parts should be included:

1. MD41-1124 (14volt) 14 volt button lighting Horiz. Mount or MD41-1134 (14volt) 14 volt button lighting Vert. Mount or
2. MD41-1128 (28volt) 28 volt button lighting Horiz. Mount or MD41-1138 (28volt) 28 volt button lighting Vert. Mount or MD41-1128(5V) (28volt) 5 volt button lighting Horiz. Mount or MD41-1138(5V) (28volt) 5 volt button lighting Vert. Mount
2. J1 Connector Kit (25 pin). MCI P/N 7014517
3. Installation Manual. MCI P/N 9015420

### 3.3 MOUNTING THE MD41-( )

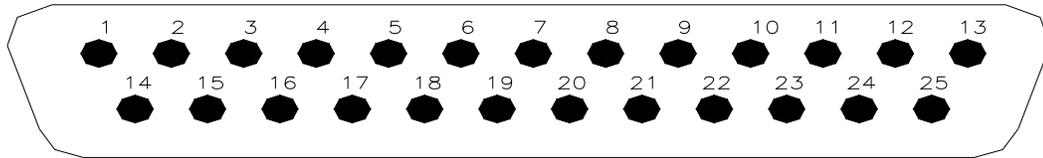
Avoid mounting close to heater vents or other high heat sources. Allow a clearance of at least 3 inches from back of unit for plug removal.

The indicator is secured in place behind the panel since it is designed for rear mount only. Make a panel cutout as shown in Figure 3-2. Secure the indicator in place with two 4-40 x 3/8 flat head Phillips screws.

### 3.4 INSTALLATION LIMITATIONS

Wire the aircraft harness according to figure 3-3 or 3-4. Use at least 24 AWG wire for all connections. Avoid sharp bends and routing cable near high-energy sources. Care must be taken to tie the harness away from aircraft controls and cables. Also see equipment limitations, section 1.2.6.

# J1 CONNECTOR

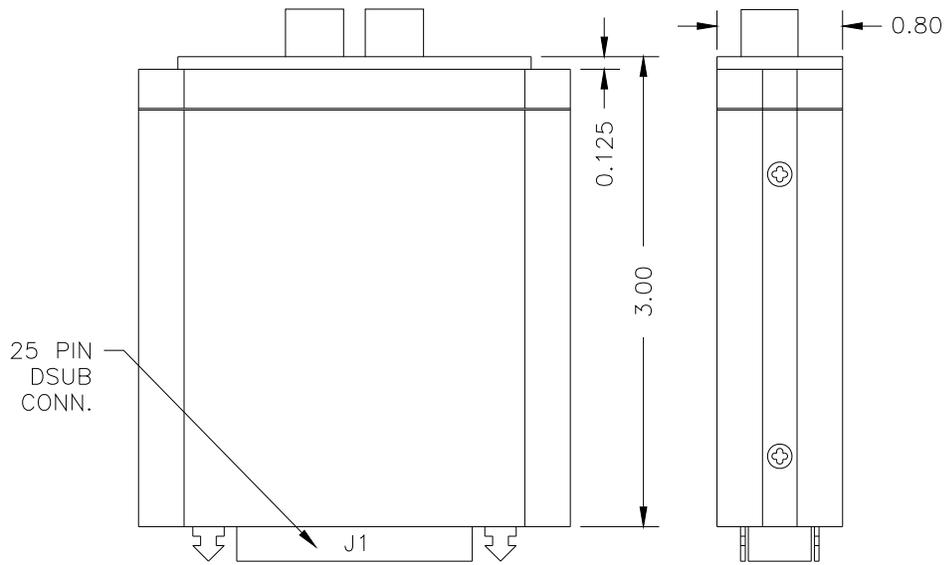


REAR VIEW OF J1 CONNECTOR

J1  
PIN NO.

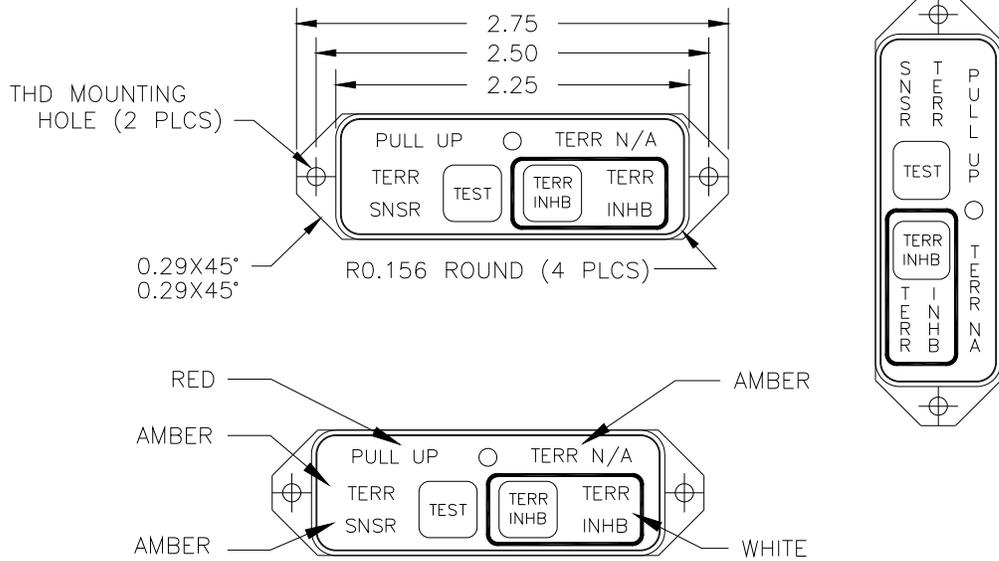
1 -----	Spare
2 -----	Spare
3 -----	Terrain Inhibit annunciation input. Receives logic low to annunciate.
4 -----	Spare
5 -----	Terrain annunciate input. Receives logic low to annunciate.
6 -----	LAMP TEST (receives ground from remote test switch)(optional conn).
7 -----	Bright/Dim annunciation lamp power.
8 -----	Push Button Lighting. To lighting buss.
9 -----	Ground for push-button lighting.
10 -----	Terrain N/A annunciate input. Receives logic low to annunciate.
11 -----	Pull-up annunciate input. Receives logic low to annunciate.
12 -----	Internal photocell dimming output. To use, jumper pin 12 to pin 7.
13 -----	14 / 28 Vdc unit power. (Depends on part number)
14 -----	Sensor annunciate input. Receives logic low to annunciate.
15 -----	Spare
16 -----	Spare
17 -----	Spare
18 -----	Terrain Self-Test switch. Momentary switch, provides ground output to select.
19 -----	Terrain Inhibit select switch. Momentary switch, provides ground output to select.
20 -----	Spare
21 -----	Power Ground
22 -----	Spare
23 -----	Spare
24 -----	Spare
25 -----	Spare

**FIGURE 3-1 SCHEMATIC PINOUT, 25 PIN DSUB**



HORIZONTAL MOUNT

VERTICAL MOUNT

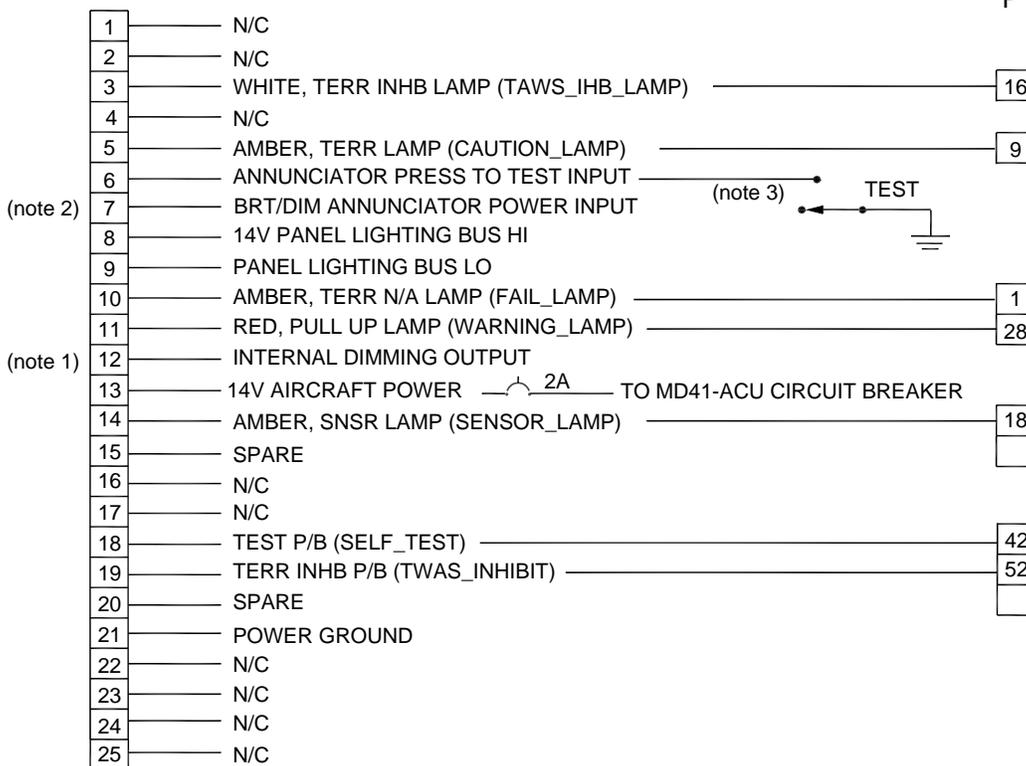


Note 1: Use two 4-40 X 3/8" Flat Head Phillips Screws for Mounting

**FIGURE 3-2 OUTLINE DRAWING**

MD41-1124 ANNUNCIATION-CONTROL  
 J1 14 VOLT

TAWS8000  
 TAWS8100  
 P1



NOTES:

- 1) JUMPER 12 TO 7 FOR ANNUNCIATION BRIGHTNESS TO BE CONTROLLED BY INTERNAL PHOTOCCELL.
- 2) IF NOT CONNECTED TO INTERNAL DIMMING, MAY BE CONNECTED TO DAY/NIGHT SWITCH.  
 NOT AIRCRAFT DIMMER
- 3) MOMENTARY SWITCH FOR LAMP TEST. (optional connection)
- 4) REFER TO L-3 COMMUNICATIONS TAWS8000 OR TAWS8100 INSTALLATION MANUAL FOR ACTUAL INSTALLATION.

**FIGURE 3-3 WIRING DIAGRAM, MD41-1124, -1134**

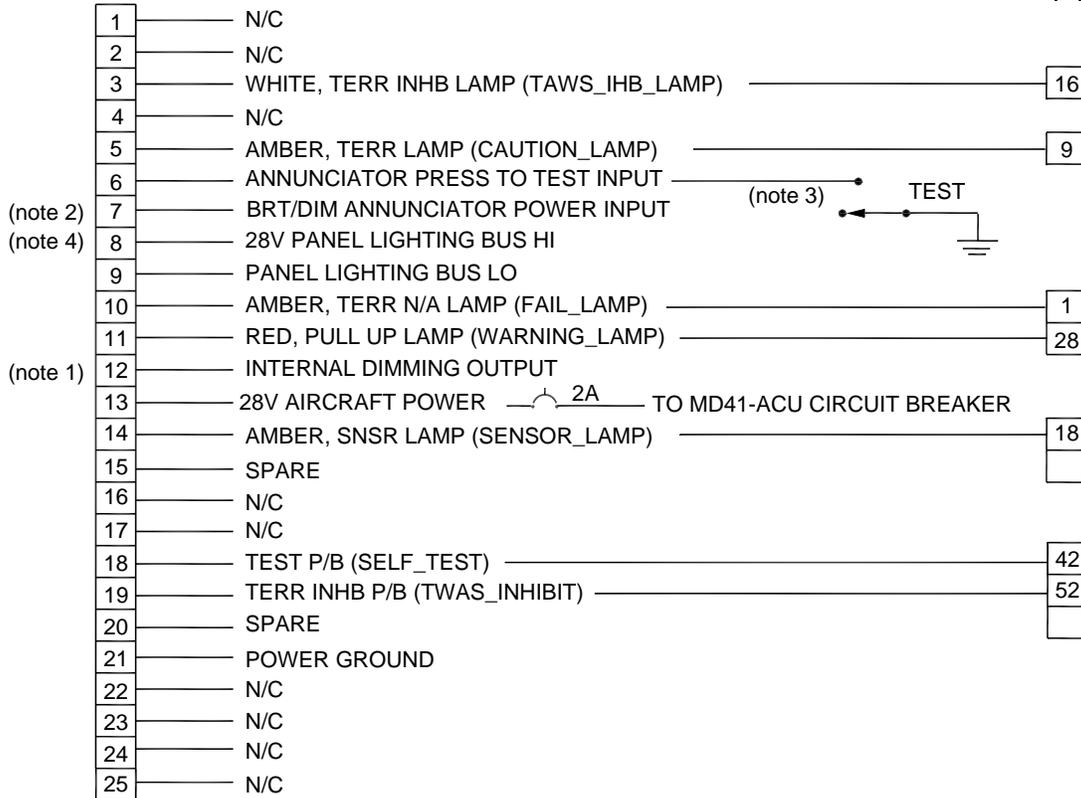
MD41-1128 ANNUNCIATION-CONTROL

J1 28 VOLT

TAWS8000

TAWS8100

P1



NOTES:

- 1) JUMPER 12 TO 7 FOR ANNUNCIATION BRIGHTNESS TO BE CONTROLLED BY INTERNAL PHOTOCCELL.
- 2) IF NOT CONNECTED TO INTERNAL DIMMING, MAY BE CONNECTED TO DAY/NIGHT SWITCH.  
NOT AIRCRAFT DIMMER
- 3) MOMENTARY SWITCH FOR LAMP TEST. (optional connection)
- 4) 5 VOLT FOR MD41-1128(5V), -1138(5V)
- 5) REFER TO L-3 COMMUNICATIONS TAWS8000 or TAWS8100 INSTALLATION MANUAL FOR ACTUAL INSTALLATION.

**FIGURE 3-4 WIRING DIAGRAM, MD41-1128, -1138, -1128(5V), -1138(5V)**

## **SECTION 4 POST INSTALLATION CHECKOUT**

### **4.1 PRE INSTALLATION TESTS**

With the MD41-11XX disconnected, turn on the avionics master switch and verify that aircraft power is on pin 13 for. Using an ohm-meter, verify pin 21 is aircraft ground.

### **4.2 OPERATING INSTRUCTIONS**

Refer to the TAWS8000 or TAWS8100 pilots guide or installation manual for final testing of the MD41-11XX.

### **4.3 AIRWORTHINESS STATEMENT**

No periodic scheduled maintenance or calibration is necessary for continued airworthiness of the MD41-11XX. If unit fails to perform to specifications, the unit must be removed and serviced by a qualified service facility.

**ENVIRONMENTAL QUALIFICATION FORM  
RTCA/DO-160C**

NOMENCLATURE: MD41-11XX SERIES TERRAIN AWARENESS  
ANNUNCIATION CONTROL UNIT

MODEL NO: MD41-()

PMA PQ3738CE

MANUFACTURER TEST SPECIFICATION:

MANUFACTURER: Mid-Continent Instruments and Avionics  
9400 E. 34<sup>th</sup> Street N.  
Wichita, KS 67226  
Phone (316) 630-0101

Conditions	Section	Description of Conducted Tests
Temperature and Altitude	4.0	Equipment tested to Categories A1 & F2 except as noted  Cooling air not required  Not Tested
Low Temperature	4.5.1	
High Temperature	4.5.2 & 4.5.3	
In-Flight Loss of Cooling	4.5.4	
Altitude	4.6.1	
Decompression	4.6.2	
Overpressure	4.6.3	
Temperature Variation	5.0	Equipment tested to Category B
Humidity	6.0	Equipment tested to Category A
Shock	7.0	Equipment tested per DO-160C Paragraph. 7.2.1
Operational & Crash Safety	7.2 & 7.3	
Vibration	8.0	Equipment tested without shockmounts to Categories M and N (Table 8-1)
Explosion	9.0	Equipment identified as Category X, no test required
Waterproofness	10.0	Equipment identified as Category X, no test required
Fluids Susceptibility	11.0	Equipment identified as Category X, no test required
Sand and Dust	12.0	Equipment identified as Category X, no test required
Fungus	13.0	Equipment identified as Category X, no test required
Salt Spray	14.0	Equipment identified as Category X, no test required
Magnetic Effect	15.0	Equipment tested to Class Z
Power Input	16.0	Equipment tested to Category B
Voltage Spike	17.0	Equipment tested to Category A
Audio Frequency Susceptibility	18.0	Equipment tested to Category B
Induced Signal Susceptibility	19.0	Equipment tested to Category A
Radio Frequency Susceptibility	20.0	Equipment tested to Category T
Radio Frequency Emissions	21.0	Equipment tested to Category Z
Lightning Induced Transient Susceptibility	22.0	Equipment identified as Category X, no test required
Lightning Direct Effects	23.0	Equipment identified as Category X, no test required
Icing	24.0	Equipment identified as Category X, no test required