



*Power Anytime, Anywhere*

# Tesla™ TI3100A Digital Volt/Amp Meter

## User Manual



*Built Smart...Proven Tough*

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**NOTE: All users must read this entire manual prior  
to operating the TI3100A DVAM.**

The TI3100A DVAM is a limited maintenance-free and sealed unit. No repairs are authorized. Warranty will be voided if unit is tampered with in any way, or if unauthorized repairs are made. For technical support please contact:

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**CAUTION**

**Shock Hazard Potential**

Improper use or failure to follow instructions in this user manual can result in unit damage and/or injury or death by electrical shock.

Any attempts to open or examine the inside of the TI3100A DVAM via a tool or device (borescope, probe, etc.) can result in unit failure and/or injury by electrical shock. This DVAM is maintenance free and should not be opened or disassembled for any reason.

Always protect the unit from short circuit.

Shipping Hazards: The TI3100A DVAM contains sealed, dry cell rechargeable batteries that do not pose a shipping hazard.

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# Abbreviations and Symbols

Abbreviations that may be used within the text, headings and titles of this manual.

## LIST OF ABBREVIATIONS




### **Abbreviation**   **Definition**

ac	Alternating Current
AFT	Airflow Technology
AWG	American Wire Gauge
amp or A	Ampere
cont	Continuous
°C	Degree Celsius
°F	Degree Fahrenheit
dc	Direct Current
EFF	Efficiency
ft	Feet
FWD	Forward
GPU	Ground Power Unit
Hr	Hour
Hz	Hertz
kg	Kilograms
kHz	Kilohertz
kW	Kilowatts
LED	Light Emitting Diode
max	Maximum
MΩ	megaohm
min	Minimum
MPU	Micro Power Unit
NEMA	National Electrical Manufacturers Association
Ω	ohm
PF	power factor
PFC	power factor correction
rms	root-mean-square
THD	Total Harmonic Distortion
TMDE	Test, Measurement, & Diagnostic Equipment
UAV	Unmanned aerial vehicle
Vac	Volts, Alternating Current
Vdc	Volts, Direct Current
W	watts

# Section 1 – Safety Review

## 1.1 - Safety Notices

Safety notices appear throughout this manual to alert the user to important information regarding proper installation, operation, maintenance and storage of the unit. These notices, as illustrated below, contain a key word that indicates the level of hazard and a triangular icon that indicates the specific type of hazard.

 <b>WARNING</b>	Indicates a condition, operating procedure or practice, which if not adhered to could result in serious injury or death.
 <b>CAUTION</b>	Indicates a condition or operating procedure, which if not strictly adhered to could result in damage or destruction of equipment.
 <b>NOTE</b>	Indicates a condition, operating procedure or practice, which is essential to highlight.

## 1.2 - Symbols

The following symbols will appear within the warning triangles to alert the user to the specific type of danger or hazard.



Figure 1.2.1 – Different types of hazard and caution symbols

### 1.3 – Hazards



**WARNING**

**Shock Hazard Potential**

Severe injury or death from electrical shock may occur, if either user or the unit is wet, while the unit is connected to a power source. If the unit has come into contact with water, disconnect ac power from the ac source. If AC Input Circuit Breaker has tripped due to water infiltration, DO NOT try to reset it with the ac line voltage attached.



**WARNING**

**Shock Hazard Potential**

Severe injury or death from electrical shock can occur when damp electrical plugs are connected to the TI3100A DVAM. Make sure the electrical outlet is switched off before making any connections. Failure to use proper grounding can cause potential shock hazard! Use only adapters with proper grounding mechanism.



Figure 1.3.1 – Universal AC Input Cannon Plug



Figure 1.3.2 – Proper Ground Grounded Plug with Grounding Pin

## Section 2 – Product Overview

### 2.1 – TI3100A DVAM Features and Overview



- 1. Digital Volt Meter** – Displays the DC voltage output.
- 2. Digital Amp Meter** – Displays the amperage draw.
- 3. Amp Meter Toggle Switch** – Provides a more detailed reading extending two decimal places.
- 4. AC Input Receptacle** – Connects to standard 10-125 VAC line voltage.
- 5. DVAM Handle** – Easily moveable to use as a handle or as a prop to angle DVAM for better view.

## 2.2 – Introduction

This manual contains the complete operating instructions and procedures for the TI3100A Digital Amp/Volt Meter (DVAM). The DVAM 3100A provides measurements for all voltage ranges and amperage draws between zero and 2,000. Perfect for high power troubleshooting and systems checks. The Ideal Diagnostics Solution! The DVAM 3100A indicates the aircraft or vehicle's current demand. Integrated with the Tesla™ Turbo Start™ GPU power supply, the DVAM is a valuable troubleshooting tool. Never before has it been so easy to isolate faults.

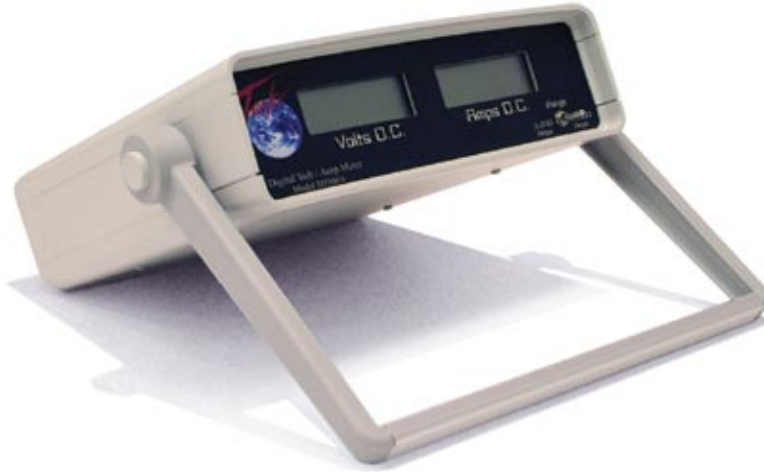


Figure 1.2.1 – TI3100A DVAM

## 2.3 – High DC Power Measuring Solution

The DVAM 3100A provides measurements for all voltage ranges and amperage draws between zero and 2,000. This is the only effective meter for high power troubleshooting. The left meter indicates DC voltage output and the right meter indicates amperage draw. The meter's range changes from 0-200 AMPS to 0-2,000 AMPS with the flip of a switch. The 200 amp setting provides a more detailed reading extending to two decimal places. The 2,000 amp setting reads higher currents such as engine starts and in rush currents.



2.3.1 - Switched to 0-200 Amps



2.3.2 - Switched to 0-2000 Amps



# Section 3 – Unit Specifications

## 3.1 – General Specifications

### Features

---

#### Voltage DC:

- 1 Vdc to 200 Vdc

#### Current DC:

- 1 amp to 2000 amps

#### Accuracy:

- .05%

#### Resolution:

- 01mV and .1 amps

#### Display:

- Dual 4.5 digit LCD Displays

#### Inputs:

- Dual Differential inputs

#### Vibration:

- Exceeds MIL-STD-810F

#### Size:

- 9.09" long x 10.90" wide x 3.69" high
- 230.89mm x 276.86mm x 93.73mm

#### Weight

- 1.6 lbs (0.7 kg)

#### Operating Temperature:

- 0°C to +70°C (32°F - 158°F)

#### Storage Temperature:

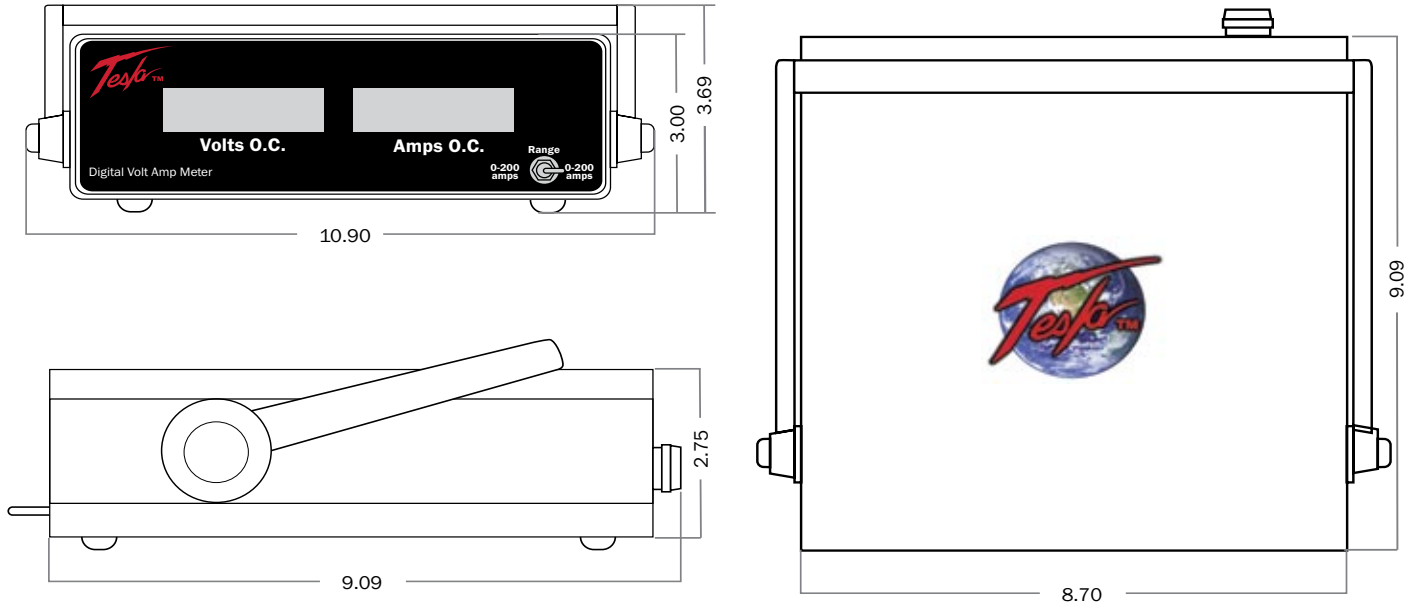
- -65°C to +80°C (-85°F to 176°F)

#### Warranty:

- 2 years (3 years optional)

### 3.2 – Physical Dimensions

\*Measurements in inches



### 3.3 – Operating Positions

The TI3100 DVAM can be operated in both the horizontal and vertical positions as shown. The moveable handle allows for the DVAM to be propped up so the two screens can be easily seen.



## Section 4 – Pre-Operation

### 4.1 – Pre-Operation

1. Be sure to check that all input and output cables are not damaged.
2. Check DVAM carefully for any evidence of damage.
3. Check that all connections are secure and free from water.



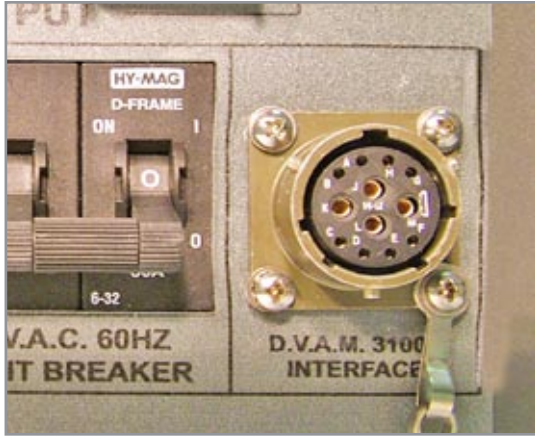
### 4.2 – Universal AC Line Cord and Interface Receptacle

The TI3100A-0010 is a Tesla™ Line cord designed to plug into either a ground power unit with a integrated receptacle, or the TI3100-00156 DC Cable equipped with a junction box.



### 4.3 – Connecting DVAM to Ground Power Unit

Some Turbo Start™ Ground Power Units are outfitted with an integrated receptacle for the TI3100 DVAM to plug directly into.



### 4.4 – Connecting DVAM Junction Box

For units other than the TI4400 and TI5400 series, a TI3100-00156 aviation cable will be needed to use the DVAM. The cable is a standard Tesla™ DC Cable equipped with a junction box, making it possible to use the DVAM with a unit that does not come with an integrated receptacle.



## Section 5 – Operation Procedures

### 5.1 – Measuring a Vehicle’s Start-Up Draw

When starting a vehicle with a Tesla™ Turbo Start™, the DVAM can be connected to measure the amount of current needed to start the vehicle. Because of the Turbo Start’s advanced electronics, the amount of current a vehicle requires is matched by our system. When starting a vehicle the amperage will peak and then level off depending on the vehicle’s current consumption curve.



### 5.2 – System Testing

The DVAM and Turbo Start™ can be used to check vehicles systems when individual systems are isolated.

- First turn off all non-related systems.
- Turn on individual system to be measured, then check current draw displayed on DVAM. Utilizing the proper military maintenance manual, compare the meter reading with the factory specifications for that system.

### 5.3 – Post Operation

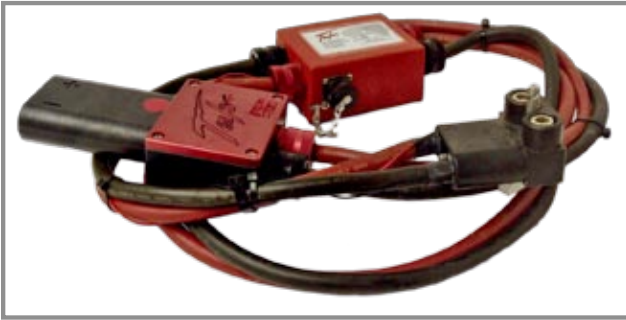
Disconnect DVAM and store in case.

### 5.4 – Unit Care

Keep DVAM in case when not in use. Keep system clean and guard from moisture.

## Section 6 – Optional Accessories

For units other than the TI4400 and TI5400 series, a TI3100A-00156 Aviation or TI3100A-00157 NATO cable will be needed to use the DVAM. Contact Tesla™ Customer Service for more information on pricing and options at (302) 324-8910.



**TI3100A-00156**  
8' DC Aviation Interface Box Cable Assembly



**TI3100A-00157**  
8' DC NATO Interface Box Cable Assembly

# Repair Request Form

Please complete the information below to ensure prompt and accurate service. Include this form with the unit you are returning. Thank you.

Date of return: \_\_\_\_\_

Company name & \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Billing address: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Contact person: \_\_\_\_\_

Phone #: \_\_\_\_\_ Fax #: \_\_\_\_\_

Email: \_\_\_\_\_

Purchase Order #: \_\_\_\_\_

Model #: \_\_\_\_\_ Serial #: \_\_\_\_\_

Model #: \_\_\_\_\_ Serial #: \_\_\_\_\_

Shipping method to Tesla™: \_\_\_\_\_

Description of shipping package: \_\_\_\_\_

Description of problem: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Return to Tesla™ Industries, Inc.**

101 Centerpoint Boulevard, New Castle, DE 19720 Attention: Repair Department



**WE GET THE MILITARY STARTED!**

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