SLICE PRO/SLICE PRO LAB
TOM User's Manual

December 2018

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DTS Support

SLICE PRO systems are designed to be reliable and simple to operate. Should you need assistance, DTS has support engineers worldwide with extensive product knowledge and crash test experience to help via telephone, e-mail or on-site visits.

The best way to contact a DTS support engineer is to submit a request through the DTS Help Center web portal (support.dtsweb.com). You must be registered (support.dtsweb.com/registration) to submit a request (https://support.dtsweb.com/hc/en-us/requests/new). Registration also enables access to additional self-help resources and non-public support information.

This manual supports the following products:
    13000-30730: SLICE PRO TOM (Timed Output Module)
    13000-30731: SLICE PRO TOM (Timed Output Module) (squib only)
    13100-30730: SLICE PRO LAB TOM (Timed Output Module)

Introducing the SLICE PRO TOM

The SLICE PRO Timed Output Module (TOM) is a self-contained system with 12 independently-programmable timing channels. Four (4) channels have programmable drivers for firing pyrotechnic initiators (hereinafter referred to as squib) common to air bags and safety belt pre-tensioning devices. There are also 8, fully-isolated, digital output channels that may be used to generate switch closure or 5 V TTL logic signals for devices such as cameras, strobes, braking systems, etc.

- Shock hardened to 100 g for dynamic testing environments (crashworthy version only).
- 4 completely independent energy delivery channels that can fire air bag squibs or other pyrotechnic devices via capacitive discharge or constant current.
- 8 digital output channels.
- Alarm output.
- Internal battery with up to 1 hour capacity functions as primary or back-up power (crashworthy version only).
- LED indicators for power, system status and squib channel status.
- Easy communications via the SLICE PRO Ethernet Controller or SLICE PRO USB Controller. (SLICE PRO LAB available with Ethernet Controller only.)
- Chainable with up to three other SLICE PRO modules.

Connector information and pin assignments can be found in Appendices A and B. Mechanical specifications are included in Appendix C. Please see your packing list for your hardware's specifications.

Connector Panel

The connector panel provides access to all squib channels (4), LED indicators, arm enable, digital output channels (8) and alarm output.

| P/N 13000-30730 | P/N 13000-30731 | P/N 13100-30730 |
| **SLICE PRO** (crashworthy) | | **SLICE PRO LAB** (stationary) |

(images not to scale)

Squib Channels (1-4)

Each SLICE PRO TOM contains 4 independent squib driver channels[1] that support both capacitive discharge and constant current. Each channel may be configured individually via software. When the system is armed, the energy storage capacitor in each programmed channel charges to ~17 V.

Current and voltage are automatically recorded for all programmed squib channels. Current is recorded via a dedicated current shunt and amplifier that converts the current into an accurate voltage. Two voltage-recording options are available under software control; you may record either the output voltage to the squib (***Record Voltage***) or the timer drive signal (***Record Initiation***).

CAUTION:

DTS does not recommend using level trigger for any testing that includes the SLICE PRO TOM.

DC Capacitive Discharge

The charged capacitor is connected to the output connector through a low resistance, solid-state switch at the pre-programmed time. Typical peak output currents are ~7 A with a 2 ohm load.

DC Constant Current

The charged capacitor is connected to the output connector through a switching regulator. Active feedback is used to regulate the output current to the programmed value. Current may be set between 1.0 A and 4.0 A in 0.1 A steps.

The duration that each TOM channel will be able to deliver the selected current is dependent upon the resistance of the connected load and the current setting. The table below provides the typical maximum pulse width at the set current for a few common settings. A detailed graph is provided in Appendix D.

Current Setting	With 2 ohm Load	With 1 ohm Load
1.0 A	44.0 ms	48.0 ms
2.0 A	17.5 ms	22.0 ms
3.0 A	9.2 ms	12.8 ms
4.0 A	4.8 ms	8.0 ms

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[1] The squib channels for P/Ns 13x00-30730 and the TDAS PRO TOM are wired identically.

Squib Resistance Test

Each squib channel contains a resistance measurement circuit that measures the voltage drop across any connected load resulting from a 1 mA current source. The useful measurement range is 0.2 to 9.5 ohms. The software records the connected squib resistance to within about 0.1 ohm accuracy during the set-up routine prior to arming.

Once the system is armed, the squib resistance of all programmed channels is constantly monitored. If any channel's resistance falls outside of the user-programmed limits for that channel, the TOM will generate a system fault and the test can be aborted if desired.

Electronic Identification (EID)

Each squib channel supports communication with silicon serial number devices manufactured by Dallas Semiconductor/Maxim Integrated Products. When an ID chip is connected to the proper pins on the squib connector, the software can read these devices and correlate the serial number to channel set-up information stored in the sensor database. (P/N 13000-30731 does not support EID.)

Squib LEDs (1 per channel)

Pre-Test		Post-Test
Channel armed (squib energized); squib within resistance tolerance limits	🟢	
System fault; channel armed (squib energized) but squib resistance out of tolerance; test may proceed	🟡	**CAUTION** – channel triggered but squib still showing continuity (no USB)
	🔴	Channel triggered (squib fired); squib now open (no USB)
Channel not armed; module idle	⚫	Channel not armed; module idle; USB active

DIGITAL OUT (8 channels)

Each SLICE PRO TOM contains 8 independent and fully isolated digital output channels[2]. (See Appendix E for digital output drive strength.) Each channel may be configured individually via software for contact closure (normally open or normally closed) or 5 V TTL logic mode signals. In either mode, these channels are not powered and remain in a high-impedance state whenever the module is idle, not armed or the data collection time window has passed.

If a device requires a certain signal level when the TOM is not powered, you may have to use pull-up or pull-down resistors as appropriate. If it is necessary to control larger loads or you have questions about your specific application, please contact DTS.

Alarm Output

An alarm output is also available on the DIGITAL OUT connector. It can be used to turn on a high-visibility, facility warning device to alert technicians of the potential safety hazards of armed/live pyrotechnic devices. Whenever the internal squib voltage source is energized or the module is armed, this output goes high. See Appendix F for alarm output drive strength.

> **WARNING:**
>
> **DTS STRONGLY RECOMMENDS all TOM users implement a high-visibility warning system and safety protocol to keep people away from potentially dangerous devices, such as air bags.**

Power Output

P/N 13000-30731 also supports 5 VDC output power (200 mA maximum) via the DIGITAL OUT connector. Please see Appendix A for pin assignments.

ARM Enable

The TOM must be hardware enabled to arm and fire the squib channels. (The squib outputs are shorted when the unit is not hardware enabled.) To hardware enable your TOM, install the ARM Enable Plug provided or move the toggle switch to the ARM position (pull out on the switch to move—*do not force*).

It is also possible to connect multiple ARM inputs in parallel and use a long cable (e.g., 70 m) to ARM enable the TOM. If you have questions about your specific application, contact DTS.

Please use caution and care when setting up and arming your . A procedure to safely disarm the SLICE PRO TOM begins on page 12.

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[2] The DIGITAL OUT connector for P/Ns 13x00-30730 and the TDAS PRO TOM are wired identically.

ARM Enable Plug (P/N 13000-30950)
(use with P/Ns 13x00-30730)

Sampling Rates

The SLICE PRO TOM has user-selectable sampling rates from 100 sps to 1 Msps. For information on how to calculate data storage duration, please see Appendix G.

Data Memory Size

With 15 GB of flash memory available for data storage, the SLICE PRO TOM can record ~14 minutes of data at the maximum sampling rate. Since the recording capacity is very large, it is generally best to limit sampling rates and event durations to the minimum necessary to avoid large and cumbersome data files. Large files take longer to download and may also be time-consuming to post-process or difficult to share. Use of the Region of Interest (ROI) download can save a great deal of time if implemented properly. For information on how to calculate data storage duration, please see Appendix G.

UP/DOWN (Bus) Interface Connectors

SLICE PRO

The UP interface connector allows the unit to interface to a SLICE PRO Ethernet Controller, USB Controller or another SLICE PRO module. (The UP connector may appear loose, however do not tighten.) The DOWN interface connector allows the unit to interface to another SLICE PRO module (chainable with up to 3 other modules). The LAB TOM uses a single 25-pin bus connector for the same functions and interfaces directly to the SLICE PRO LAB rack. Please see Appendix B for pin assignments.
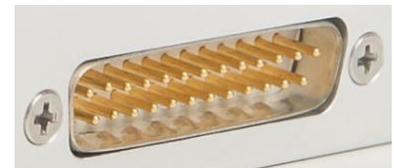
SLICE PRO LAB

Status (STS) and Power (PWR) LEDs

There are 2 LED indicators. The STS LED indicates communication and arm status and the PWR LED indicates power status. At system power-up, the red-green-blue LED initialization sequence is performed by the STS LED followed by the PWR LED.

LED behavior is summarized below.

Recorder Mode	STS	Circular Buffer Mode
Armed and waiting for Start Record signal to begin data collection	🔵	
Start Record signal received and recording data; waiting for Event signal	🟢	Armed and recording data; waiting for Event signal
Event signal received –or– fault	🔴	Event signal received –or– fault
Event signal received + data collection completed (no USB)	🔴✴	Event signal received + data collection completed (no USB)
Fault received + data collection completed (no USB)	🔴✴	Fault received + data collection completed (no USB)
Data collection completed; PC downloading data	🟢✴	Data collection completed; PC downloading data

Condition	STS	PWR
Charging (system off and connected to external power)[1]		
Unit is charging (power OK)[1]	⚫	🟢✴
Unit fully charged[1]	🟢	⚫
System on; not armed		
Power up	🔴🟢🔵⚫ . . .	🔴🟢🔵⚫
Power OK; no USB	⚫	🟢
Power OK; USB connected		🔵
Power fault (out of range)		🔴
Communicating with host	🟢✴	

[1] SLICE PRO LAB systems do not contain internal batteries and must be connected to external power at all times.

Timing Functions

Each TOM has a total of 12 timing channels which are programmable in 0.1 ms increments. There are 2 time-related software settings for each channel: ***DELAY*** and ***DURATION***.

DELAY is the interval between the event signal and the beginning of the output pulse (i.e., a switch closure at impact or T=0). This interval can be set independently for each channel from 0.25 ms (hardware limitation) to 99,000 ms (99 seconds).

DURATION is the time window during which the output signal will be active. This interval begins at the end of the delay period.

By checking the "Limit Duration" box in the software, the duration parameter may be set independently from 0.2 to 25.5 ms for each of the four squib driver channels. (If the "Limit Duration" box is not checked, the output driver will turn on and stay on for 40 ms or the length of the test, whichever is less.) Additionally, digital output duration can be set independently between 0.2 ms and 1600.0 ms for each channel.

In either case, all channels may be active only during the pre-programmed data collection time window. This means that the post-event data collection duration must be greater than the longest duration output event on any squib or digital output channel.

Basic Care and Handling

SLICE PRO systems are precision devices designed to operate reliably in dynamic testing environments. Though resistant to many environmental conditions, care should be taken not to subject the unit to harsh chemicals, submerge it in water, or drop it onto any hard surface.

> **WARNING:**
>
> **Electronic equipment dropped from desk height onto a solid floor may experience up to 10,000 g. Under these conditions, damage to the exterior and/or interior of the unit is likely.**

The SLICE PRO TOM is supplied with calibration data from the factory. DTS recommends annual recalibration to ensure that the unit is performing within factory specifications. The SLICE PRO TOM is not user-serviceable and should be returned to the factory for service or repair.

When not in use or if shipping is required, we suggest that you always place the unit in the padded carrying case originally provided with your unit.

Safety

TOM modules employ a three-tiered safety protocol:

1. The software must receive set-up and arming commands from the user in the correct sequence.
2. The module firmware must load a safety key (bit pattern) into the fire controller.
3. The unit must be hardware enabled (i.e., the ARM Enable Plug is installed or the toggle switch is in the ARM position).

> **WARNING:**
>
> **DTS STRONGLY RECOMMENDS all TOM users implement a high-visibility warning system and safety protocol to keep people away from potentially dangerous devices, such as air bags.**

DTS recommends the following procedure to disarm the TOM (note: do *not* turn off the Controller if the system is armed):

1. <u>Enable hardware safing of all TOMs</u>. (Remove the ARM Enable Plug or move the toggle switch to the SAFE position.)
2. <u>Disarm the unit via your software</u>. (Hardware safing is done first in the event of a communication/software failure.)
3. If you are using TDAS Control, <u>use *Post→DisArm Test*</u> as an additional safety pre-caution. This will remove power from the TOM firing circuit.

Shock Rating
The SLICE PRO TOM is rated for 100 g, 12 ms half-sine duration, in all axes.

SLICE PRO LAB equipment is not crashworthy and should not be exposed to shock, vibration or other extreme environmental conditions.

Mounting Considerations
Crashworthy SLICE PRO equipment should be bolted securely to the test vehicle or dynamic testing device to provide the best shock protection. Mounting methods and hardware selection should be carefully calculated to withstand expected shock loading and facilitate proper grounding. Check bolt tightness periodically to ensure that 1) the unit is securely fastened to the baseplate, and 2) the baseplate is securely fastened to the testing platform. (See Appendix C for the unit's mechanical specifications.)

DTS strongly recommends that all equipment be properly grounded to minimize any risk of data noise due to high-current transients. The test vehicle or dynamic testing device should be connected to earth ground. Crashworthy SLICE PRO equipment should be grounded to each other and bolted to the test vehicle. SLICE PRO LAB modules should be bolted to the rack and the rack properly grounded. DTS recommends checking continuity between the enclosures of each unit to confirm resistance readings of <1 ohm.

Thermal Considerations
SLICE PRO systems are low power devices with negligible self-heating and it is unlikely that self-heating will be an issue in real-world testing. Should you have any questions about using SLICE PRO in your environment, please contact DTS.

> **WARNING:**
>
> **Due to battery chemistry, do not operate SLICE PRO DAS at temperatures below 0°C (32°F) or in excess of 60°C (140°F).**

Power Management

A good power source is of paramount importance. SLICE PRO TOMs should be powered from a SLICE PRO Controller. (One Controller can support up to 4 SLICE PRO modules.) Be sure to consider any power drop due to cable length.

Input Voltage, System OFF/ON	Power Consumption, System OFF*	Power Consumption, System ON**
11.5-15 VDC; 15 VDC nominal	7.5 W; 500 mA per module***	12 W; 800 mA per module***

* charging all internal batteries   ** fully armed + charging all internal batteries
*** Controllers are considered modules for the purposes of power calculations.

SLICE PRO LAB systems do not contain internal batteries and must be connected to external power at all times (15 VDC nominal; 9-15 V range at 40 W via the SLICE PRO LAB Ethernet rack).

Power Consumption

Power off: When connected to sufficient external power, the SLICE PRO TOM will draw up to 500 mA for charging the internal battery.

Power on: When the TOM is initially powered, all excitation circuits, signal conditioning sources, etc., are in a shutdown state. When the user runs a test set-up, the software automatically energizes these circuits. The current draw per TOM will increase to as much as 800 mA when the system is fully armed.

During data collection: Once the system has been armed, all circuits remain in a full power state until data collection is finished. After the data collection routine has completed, the system de-energizes several circuits to minimize power consumption.

Internal Battery

The SLICE PRO TOM contains an internal 7.4 V (nominal) lithium battery that operates as primary power or back-up power should primary power fail. When fully charged, battery capacity is sufficient to provide primary power and sustain full operation for 1 hour. It charges whenever sufficient external power is connected to the module via a SLICE PRO Controller. The maximum charge time is 3-4 hours from complete discharge to full capacity. The module does not need to be ON in order to charge the internal battery.

Charging practices can affect the useful operational life of the battery. In addition to good charging habits, conditioning the battery may be useful—3 deep-discharge/recharge cycles may help increase battery performance. The battery's useful capacity is greatly shortened near the end of its service life and should be replaced when it has decreased to 50% of its initial capacity. The battery is not user-serviceable and should be returned to the factory for battery replacement.

> **WARNING:**
>
> **Due to battery chemistry, do not operate SLICE PRO DAS at temperatures below 0°C (32°F) or in excess of 60°C (140°F).**

SLICE PRO LAB systems do not contain internal batteries and must be connected to external power at all times (15 VDC nominal; 9-15 V range at 40 W via the SLICE PRO LAB Ethernet rack).

Power-up and Power-down Procedures

The SLICE PRO TOM is powered up when the proper signal is connected at the UP interface connector. This is typically accomplished via a SLICE PRO Controller. Power-up of the module takes 10 seconds (USB Controller) or between 1-2 minutes (Ethernet Controller), after which communication is enabled.

To restart a system, turn off the Controller and wait ~30 seconds before reinitializing. (Press and hold the switch firmly for 2 seconds to start or stop the system.) If a system is armed for data collection, it will remain on until it is disarmed or power reserves are exhausted. An incomplete power-down/power-up cycle can result in errors, so be certain to follow proper procedures.

> **CAUTION:**
>
> **Do not turn off the Controller if the system is armed. You must disarm the system before initiating a system restart.**

Communication Features

Communications with the SLICE PRO TOM is accomplished via 1) a SLICE PRO USB Controller and USB comm cable (USB A to USB B) or 2) a SLICE PRO Ethernet Controller and Ethernet (REC) comm cable (P/N 10700-0015x). Please see the SLICE PRO USB Controller or SLICE PRO Ethernet Controller User's Manuals for additional information.

Appendix A: SLICE PRO TOM Connector Pin Assignments
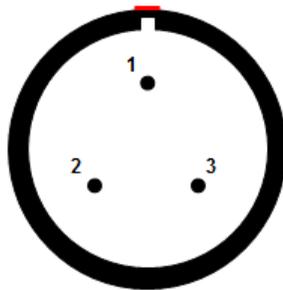
6-pin Squib Output channels 1-4*
(EEG.2B.306.CLL)
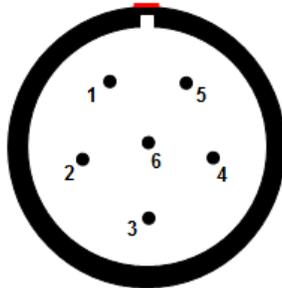
(panel view)

Suggested cable connector P/N:
FGG.2B.306.CLADxx**

Pin	Function
1	+ Squib
2	+ Sense***
3	+ ID
4	- ID
5	- Squib
6	- Sense***

3-pin ARM connector
(EEG.2B.303.CLL)

(panel view)

Suggested cable connector P/N:
FGG.2B.303.CLADxx**

Pin	Function
1	Arm enable (short to pin 2)
2	Arm enable (short to pin 1)
3	No connection

19-pin DIGITAL OUT connector*
(EEA.2B.319.CLL)

(panel view)

Suggested cable connector P/N:
FGA.2B.319.CLADxx**

Pin	Function
1	+ Digital out (Ch 1)
2	- Digital out (Ch 1)****
3	+ Digital out (Ch 2)
4	- Digital out (Ch 2)****
5	+ Digital out (Ch 3)
6	- Digital out (Ch 3)****
7	+ Digital out (Ch 4)
8	- Digital out (Ch 4)****
9	+ Digital out (Ch 5)
10	- Digital out (Ch 5)****
11	+ Digital out (Ch 6)
12	- Digital out (Ch 6)****
13	+ Digital out (Ch 7)
14	- Digital out (Ch 7)****
15	+ Digital out (Ch 8)
16	- Digital out (Ch 8)****
17	+ Alarm output
18	- Alarm output (do not connect to ground)
19	No connection

 * P/Ns 13000-30730 and 13100-30730 are wired identically to TDAS PRO TOM.
 ** Connector shell is ground and may be used to connect the cable shield. xx denotes diameter of cable to be used; e.g.,
     52 = 5.2 mm. See www.lemo.com for more information.
*** See page 17 for information on ±Sense leads.   **** All –Digital Outputs must be within 24 V of ground.
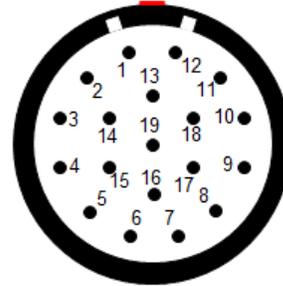
2-pin SQUIB OUTPUT channels 1-4
(ECP.0S.302.CLL)

(panel view)

Suggested cable connector P/N:
FFA.0S.302.CLACxxZ**

Pin	Function
1	+ Squib (socket)
2	- Squib (pin)

19-pin DIGITAL OUT connector*
(EEA.2B.319.CLL)

(panel view)

Suggested cable connector P/N:
FGA.2B.319.CLADxx**

Pin	Function
1	+ Digital out (Ch 1)
2	- Digital out (Ch 1)***
3	+ Digital out (Ch 2)
4	- Digital out (Ch 2)***
5	+ Digital out (Ch 3)
6	- Digital out (Ch 3)***
7	+ Digital out (Ch 4)
8	- Digital out (Ch 4)***
9	+ Digital out (Ch 5)
10	- Digital out (Ch 5)***
11	+ Digital out (Ch 6)
12	- Digital out (Ch 6)***
13	+ Digital out (Ch 7)
14	- Digital out (Ch 7)***
15	+ Digital out (Ch 8)
16	- Digital out (Ch 8)***
17	+ Alarm output
18	- Alarm output (do not connect to ground)
19	+5 VDC output (200 mA maximum)
Shell	-VDC/Ground

  * Only P/N 13000-30731 supports output power.
 ** Connector shell is ground and may be used to connect the cable shield. xx denotes diameter of cable to be used; e.g., 52 = 5.2 mm. Z denotes bend relief (optional). See www.lemo.com for more information.
*** All –Digital Outputs must be within 24 V of ground.

Voltage Sensing

Four-wire resistance measurements are also available via the squib connectors. As delivered, use of the ±Sense leads is optional and do not need to be connected for normal operation. This feature is enabled by removing jumpers inside the TOM and properly connecting the ±Sense leads on the squib connectors. Please contact DTS if you need to implement this feature. (P/N 13000-30731 does not support voltage sensing.)

Suggested Connector Sources

DTS uses LEMO connectors on the SLICE PRO TOM. If you need to purchase connectors, we suggest first going to LEMO directly (www.lemo.com). Their web site and worldwide sales team are very helpful. Should you have difficulty obtaining a specific part number, they can suggest connector variations or alternates and explain options that may be useful for your particular application. Another U.S. source is Alpine Electronics (www.alpine-electronics.com) in San Jose, California. They are a stocking distributor for LEMO connectors.

Suggested Cable Specifications

DTS strongly recommends using a quality, shielded cable with the SLICE PRO TOM. Cable shields should always be connected to the DAS end using either the connector shell or available ground/shield pin. *Do not connect the shield at both ends*—this will create a ground loop.

Belden 8412 or 8424 is suggested for use with the squib channels, but a smaller gage could also be used (20 AWG is the maximum gage recommended for the LEMO squib connector solder contacts). Belden 9509 or 9542 is suggested for the digital/alarm outputs.

Appendix B: UP/DOWN (Bus) Connector Information

UP interface connector*
(Omnetics A99077-015;
MMDS-015-N06-SS)
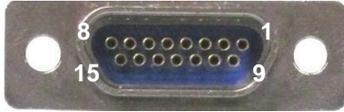
(panel view)

**DOWN interface connector**
(Omnetics A98000-015;
MMDP-015-N00-SS)

(panel view)

Pin	Function
1	VDC in (UP)/out (DOWN)
2	VDC in (UP)/out (DOWN)
3	Ground
4	Ground
5	/ON (contact closure input to ground)
6	/EVENT (contact closure input to ground)
7	/START (contact closure input to ground)
8	Status input (UP)/output (DOWN) (5 V via 10k with respect to ground)
9	VDC in (UP)/out (DOWN)
10	VDC in (UP)/out (DOWN)
11	Ground
12	Ground
13	USB_DP
14	USB_DM
15	USB power

* The UP connector may appear loose. Do not tighten.
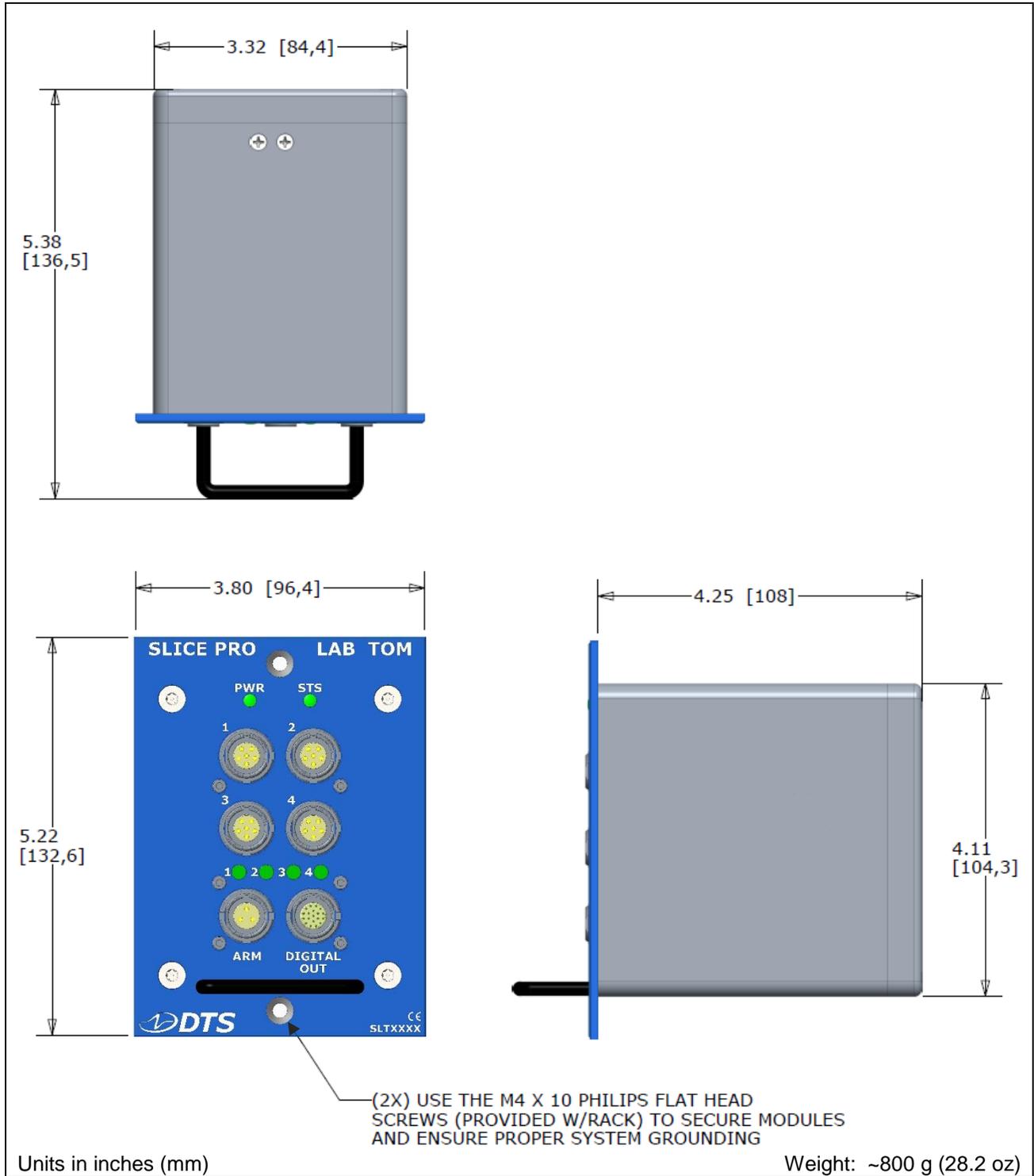
25-pin Bus connector
(172-025-102R021)
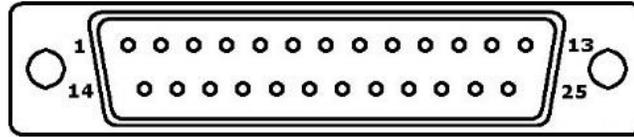
(panel view)

Pin	Function
1	Reserved
2	Reserved
3	No connection
4	USB_DM (UP)
5	USB_DP (UP)
6	USB power (UP)
7	No connection
8	Reserved
9	Reserved
10	VDC in
11	VDC in
12	VDC in
13	VDC in
14	Reserved
15	USB_DM (DOWN)
16	USB_DP (DOWN)
17	USB power (DOWN)
18	Status (5 V via 10k with respect to ground)
19	/START, CC to ground
20	/EVENT, CC to ground
21	/ON, CC to ground
22	Ground
23	Ground
24	Ground
25	Ground

Appendix C: Mechanical Specifications

| Units in mm (inches) | Torque spec: 84 in-lb (M6) | Weight: ~750 g (26.5 oz) |

3.32 [84,4]

5.38 [136,5]

3.80 [96,4]

4.25 [108]

SLICE PRO **LAB TOM**

PWR   STS

1   2

3   4

1 2 3 4

ARM   DIGITAL OUT

DTS

SLTXXXX

5.22 [132,6]

4.11 [104,3]

(2X) USE THE M4 X 10 PHILIPS FLAT HEAD SCREWS (PROVIDED W/RACK) TO SECURE MODULES AND ENSURE PROPER SYSTEM GROUNDING

Units in inches (mm)   Weight: ~800 g (28.2 oz)
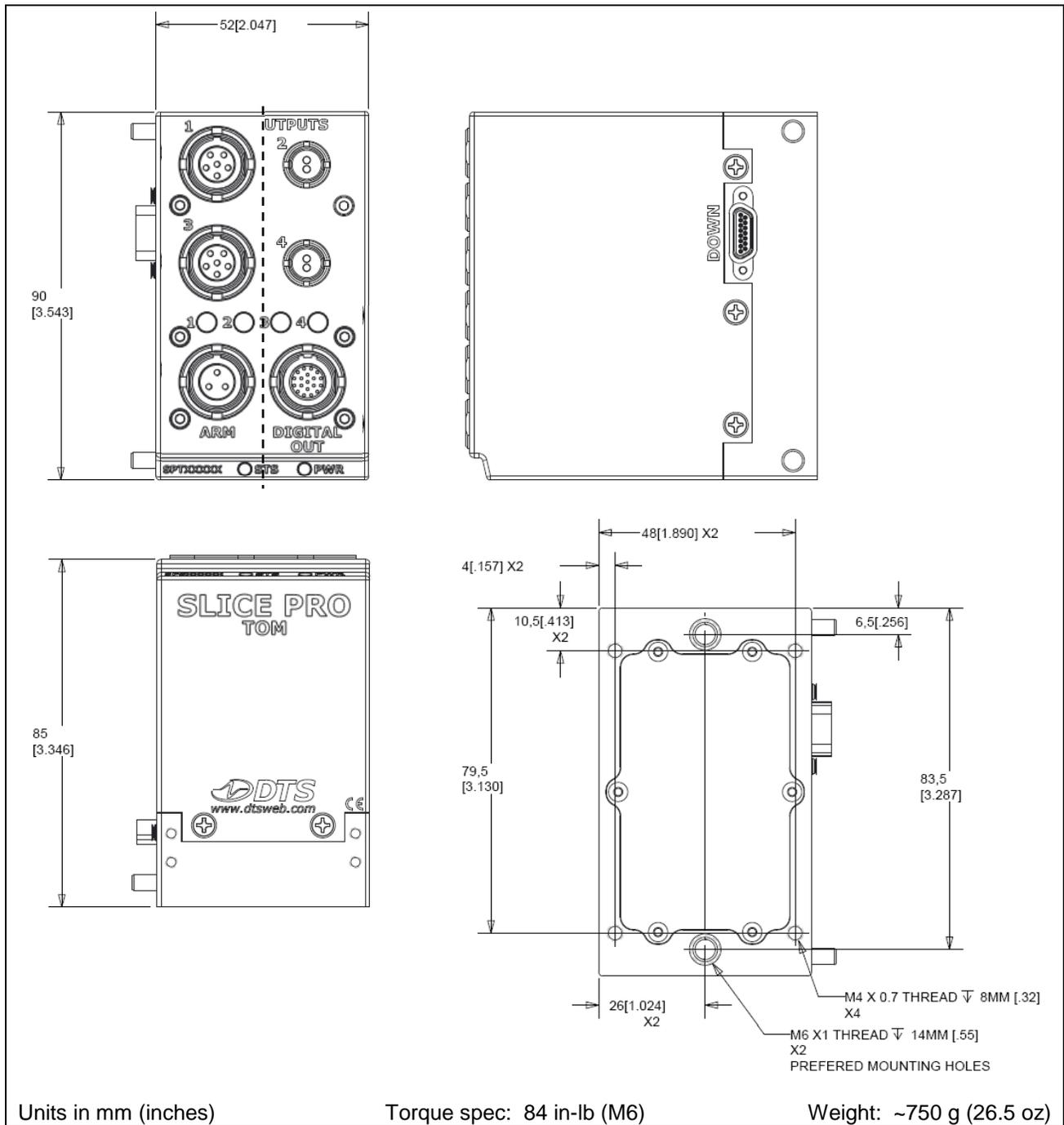
Accessories/Support Equipment:

10200-00030: TOM Squib Fire LED Indicator Plug (use with 13x00-30730)
10200-00031: TOM Squib Fire Dummy Load Plug (use with 13x00-30730)
10200-00040: TOM Shorting Plug for Squib Output (TSX) Cable (use with 10700-0024x)
10700-00230: Cable, TOM DIG OUT to TOM terminal box (12000-00110) (150 cm)
10700-0024x: Cable, TOM squib out to pigtail term (TSX) (use with 13x00-30730)
12000-00110: TOM (Timed Output Module) Terminal Box
13000-30950: SLICE PRO TOM ARM Enable Plug (photo page 9) (use with 13x00-30730)
13000-31080: SLICE PRO LAB Rack Benchtop Enclosure (DAS not included)
13000-31220: Cable, TOM squib out to pigtail term (TSX) (6 m) (use with 13000-30731)
13100-00010: SLICE PRO LAB 4-module Rack, Ethernet
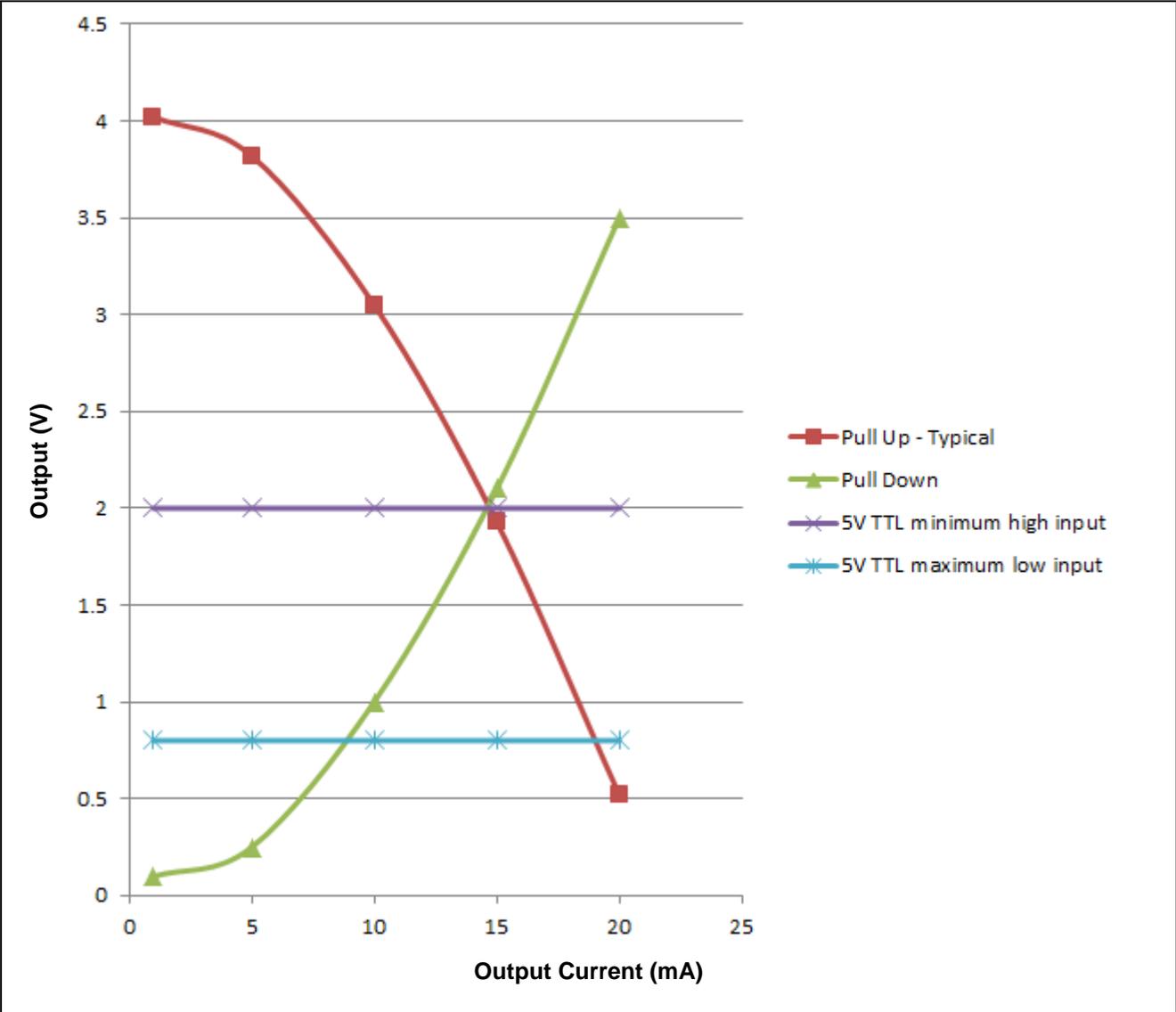
(x = multiple lengths available)
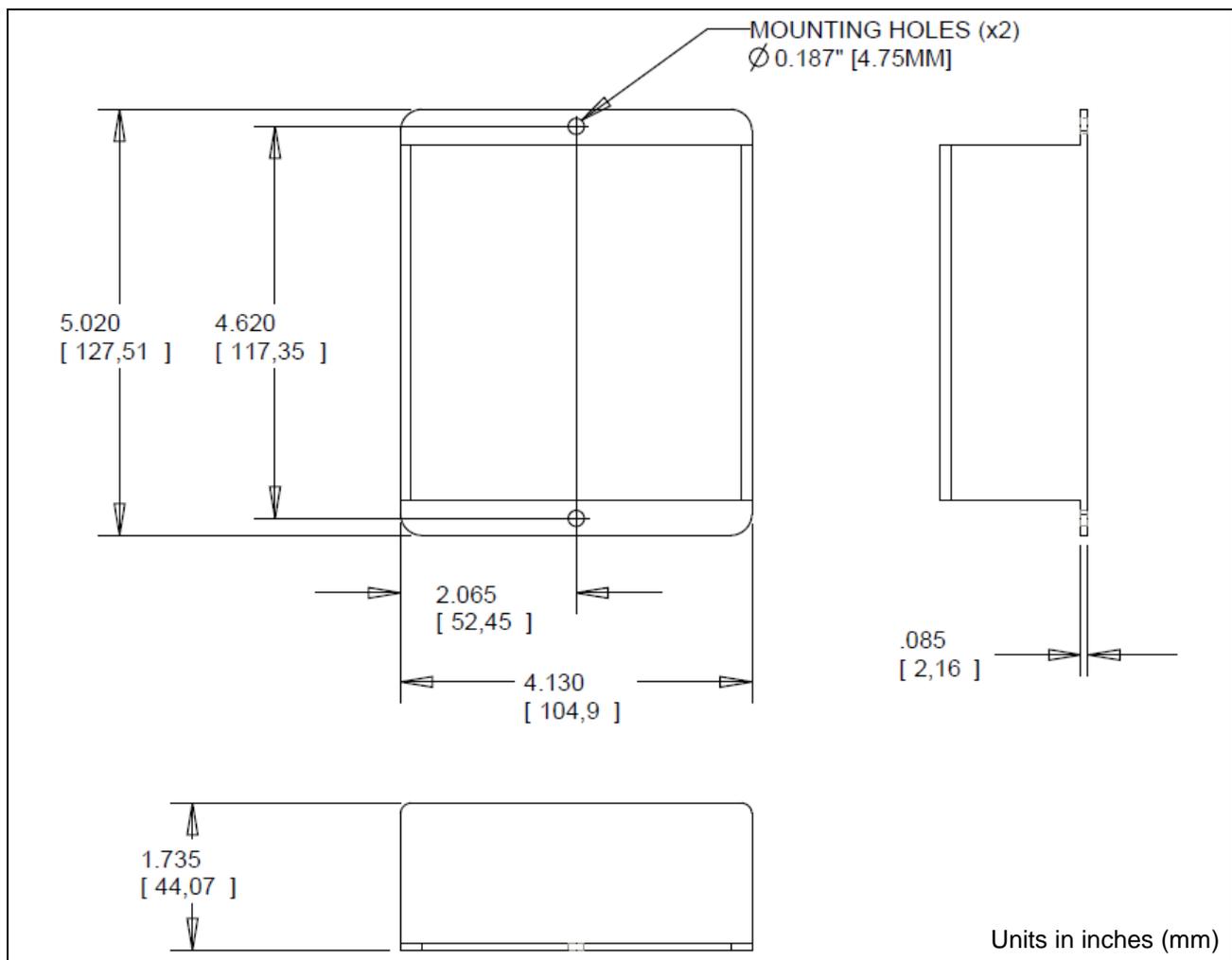
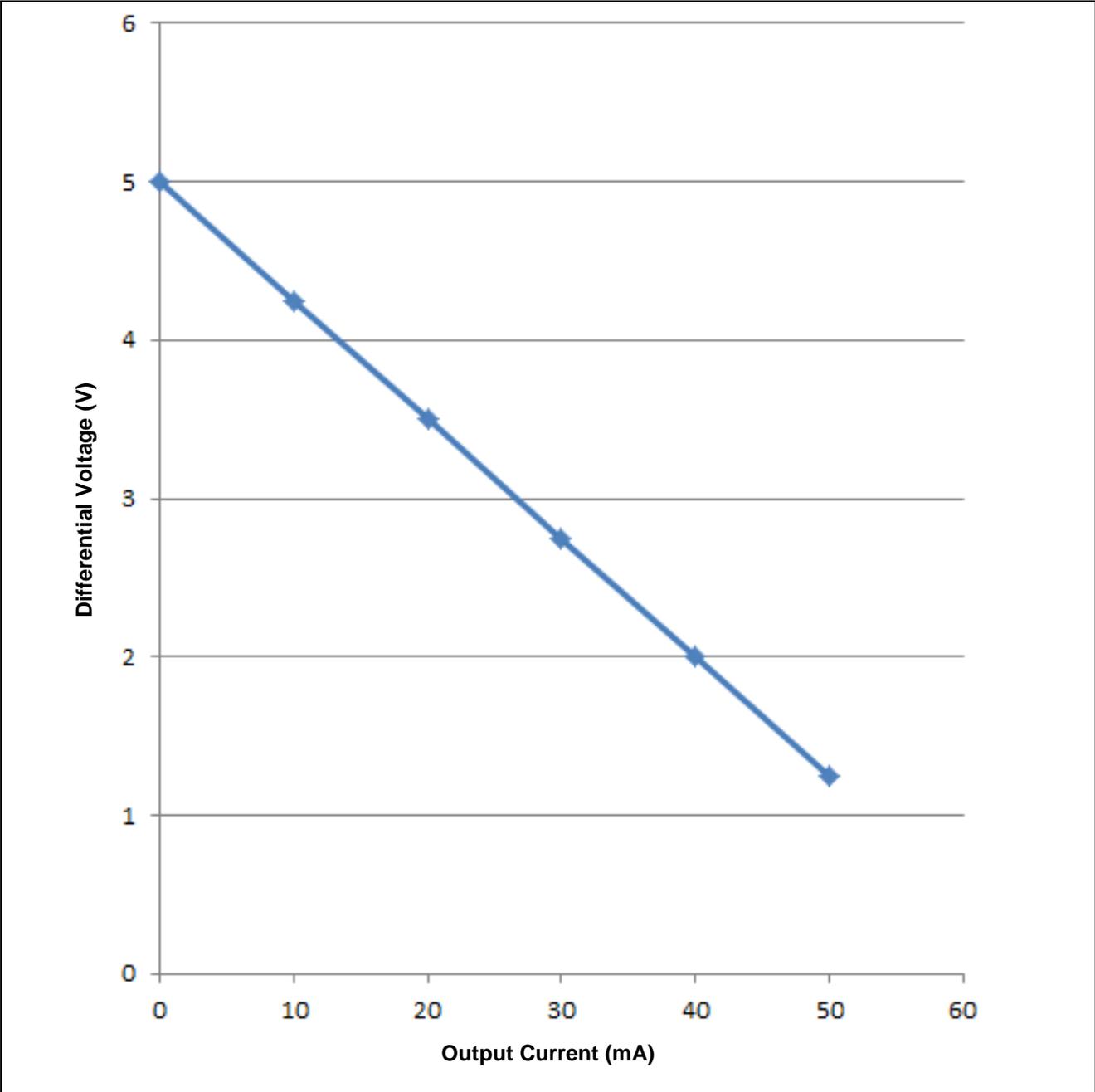**12000-00110: TOM Terminal Box Dimensions**

Appendix D: Constant Current Mode [approximate time (ms) in regulation]
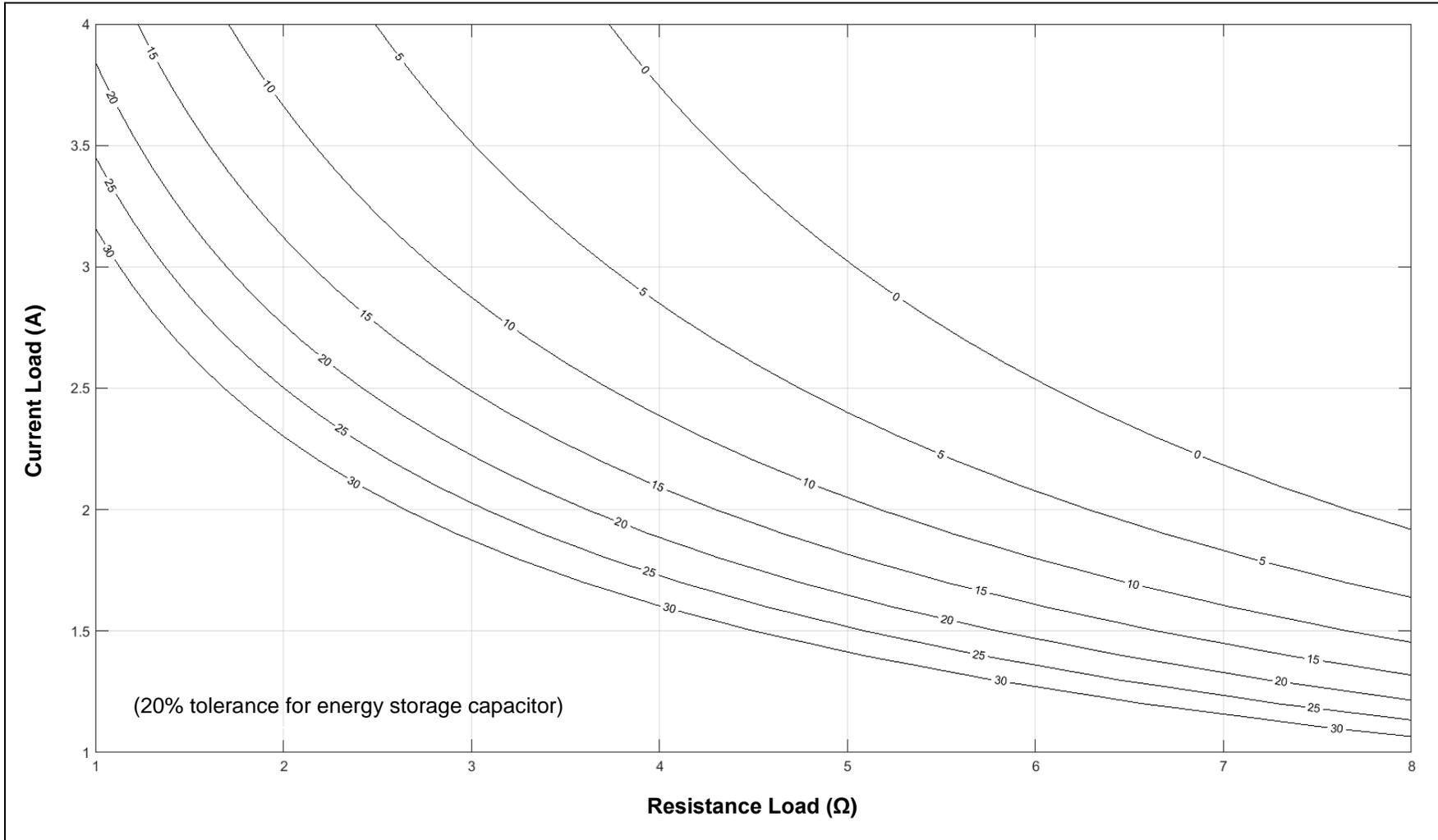
Appendix E: Digital Output Drive Strength

Appendix F: Alarm Output Drive Strength

Appendix G: How to Calculate Data Storage Duration

The SLICE PRO TOM has user-selectable sampling rates from 100 sps to 1 Msps. All 9 channels are recorded even if they are not needed for your test.[3]

With 15 GB available for data storage, there are 7,500 M samples available in each SLICE PRO TOM (1 sample = 2 bytes). To determine the recording time possible given the number of channels and sampling rate, use the equation below:

$$\frac{7,500,000,000}{\text{Sampling rate (sps)} \quad X \quad \underset{\text{(\# of channels)}}{9}} = \text{\# of seconds}$$

Example 1: 100,000 sps using 9 channels

$$\frac{7,500,000,000}{100,000 \quad X \quad 9} = 8,333 \text{ sec (2.32 hours)}$$

Circular Buffer Limitations

Due to the nature of flash memory, the system cannot be armed in *Circular Buffer* mode indefinitely. To determine the maximum time available in *Circular Buffer* mode, use the equation below:

$$0.8 * \text{recording time} = \text{maximum time available in } Circular\ Buffer \text{ mode}$$

Example:

$$0.8 * 8,333 \text{ sec} = 6,666 \text{ sec (111 minutes)}$$

In this example, the test must occur within 111 minutes, after which time the unit stops recording data.

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[3] Each squib channel uses 2 data channels; 1 data channel is used for all digital output channels.

DECLARATION OF CE CONFORMITY

Description	Model
Data Acquisition Module	SLICE PRO Sensor Input Module
Data Acquisition Module	SLICE PRO Timed Output Module
Data Acquisition Module	SLICE PRO Digital Input Module
Data Acquisition Module	SLICE PRO Trigger Distributor
Data Acquisition Module	SLICE PRO Ethernet Controller
Data Acquisition Module	SLICE PRO USB Controller

The undersigned hereby declares that the products listed above, manufactured by Diversified Technical Systems, Inc., Seal Beach, California, USA, conform to the following directive and standards:

Applicable Council Directive: **89/336/EEC – Electromagnetic Compatibility**

Applicable Harmonized Standards: **EN 55022:1998, EN 55024:1998**
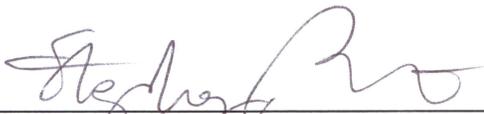
Stephen Pruitt, President
Diversified Technical Systems, Inc.

February 10, 2015
Date

Revision History

Rev	Date	By	Description
3	19 Dec 2018	EK	Added sections on Sampling Rates, Data Memory Size and How to Calculate Data Storage (Appendix G.)
2	28 Mar 2018	EK	Added new squib-only TOM configuration (P/N 13000-30731).
1	13 Apr 2017	EK	Updated to include SLICE PRO LAB. Revised max VDC input. Added grounding info and disarming procedure. Added operational temp range. Added info on voltage sensing and cable recommendations. Added CE Declaration as Appendix G.
0	17 Nov 2015	EK	Initial release.