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# TDAS G5 iPort User's Manual



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## DTS Support

TDAS 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 e-mail [support@dtsweb.com](mailto:support@dtsweb.com). Your e-mail is immediately forwarded to all DTS support engineers worldwide and is typically the fastest way to get a response, particularly if you need assistance outside of normal business hours. For assistance by telephone, please go to <http://www.dtsweb.com/support.html> to find the phone number appropriate for your region of the world.

# Introducing the TDAS G5 iPort

The TDAS G5 iPort allows for easy installation of a TDAS G5 Data Acquisition System (DAS) into a crashworthy enclosure for dynamic testing applications. Power, Ethernet communication and event signals are easily accessible via the DB25F connector. Sensors are easily connected via four DB44F connectors. A TDAS G5 DAS can be moved easily from an in-dummy application to a TDAS G5 iPort for maximum flexibility of data acquisition resources. TDAS G5 iPorts may be interconnected via a TDAS G5 Distributor, TDAS PLUS Mini Distributor or TDAS PLUS Distributor to create higher channel-count systems.

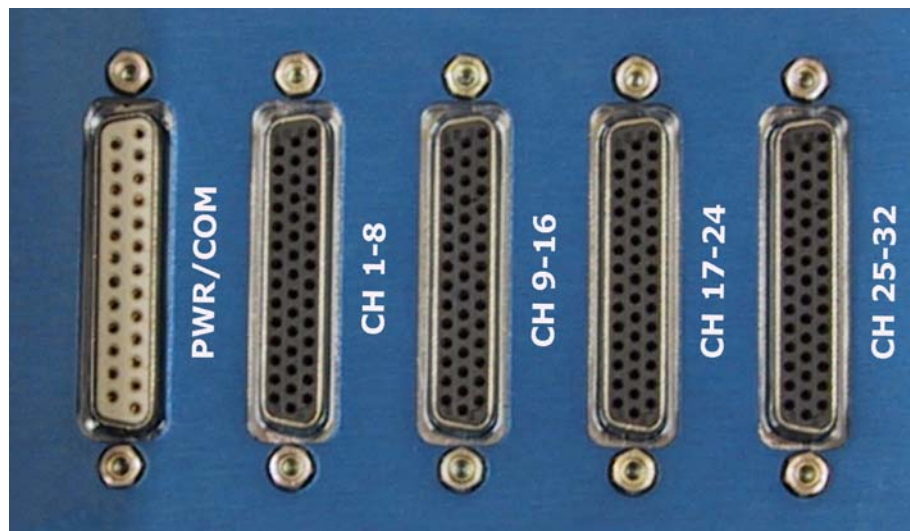
This manual discusses the features and options available with the TDAS G5 iPort. To identify the specific hardware included with your system, please see your packing list.

## Overview of TDAS G5 iPort Features

- Built and tested for 100+ G dynamic testing environments.
- 32 sensor input channels.
- 5 volt excitation sources.
- Ethernet 10/100BaseT communications.
- Contact-closure event input.
- Electronic identification (EID) support.
- Integral mounting holes.

Please see the DTS web site ([www.dtsweb.com](http://www.dtsweb.com)) for the latest hardware specifications.

## TDAS G5 iPort Connector Panel



### Power/Communications (DB25 connector)

The DB25 connector on the TDAS G5 iPort allows you to connect 15 V, 2 A external power, a contact-closure event signal, a single EID input, and Ethernet 10/100BaseT communication signals to your PC. Please see Appendix A for connector specifics and pin assignments.

**WARNING:**

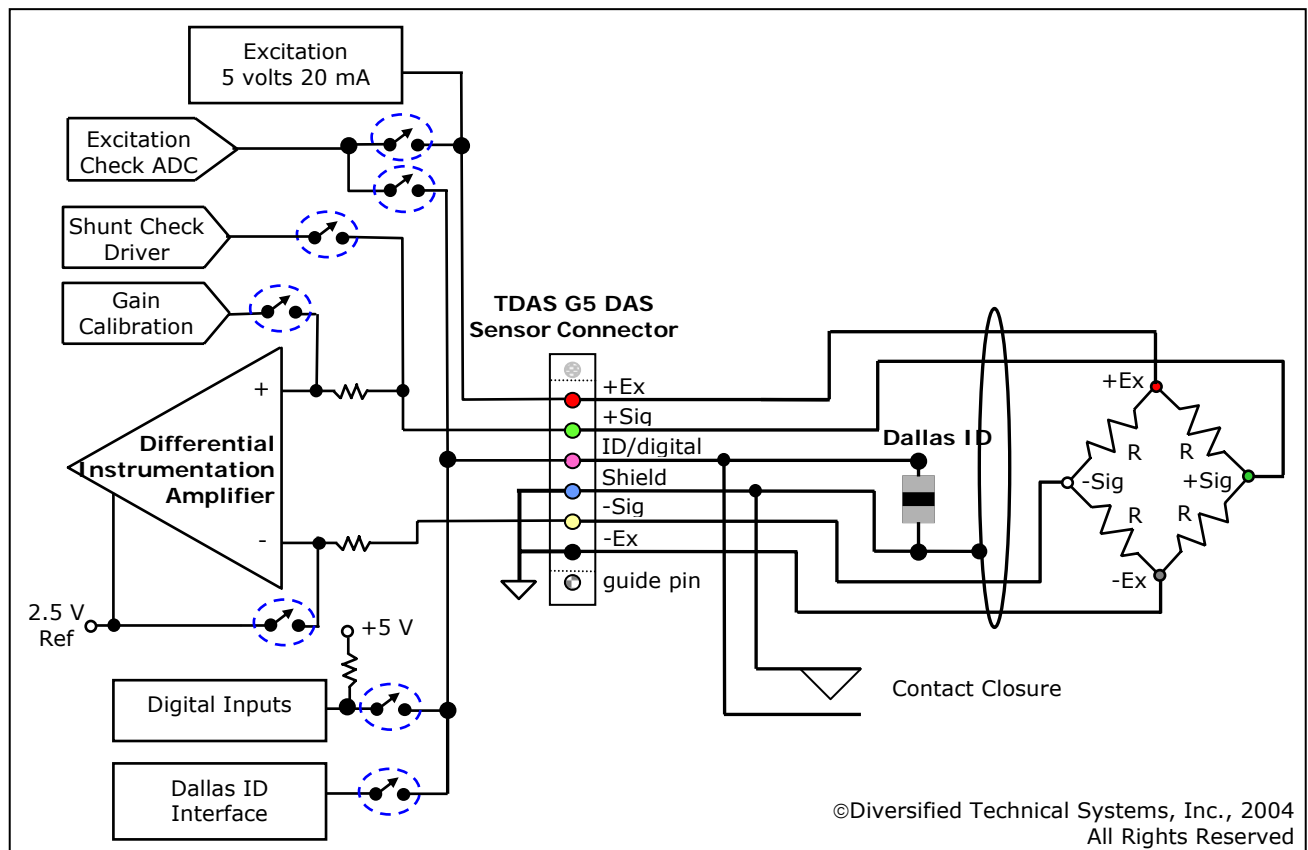
Do not apply external voltages to the EVENT input — this could result in damage to the unit. A simple FET switch can be used to convert a voltage input to an appropriate contact closure. Please contact DTS if you need assistance.

### Sensor Input Channels (DB44 connectors)

Eight sensor channels and eight EID inputs are available via each DB44 connector. Please see Appendix A for connector information and pin assignments.

#### Sensor Connections

All TDAS G5 iPorts have sensor connections as shown below.



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Sensor Connections

### **Sensor Input Range**

The nominal sensor input range is  $\pm 2.5$  volts (differential) at a gain of 1. The rated common-mode voltage range is 0.3 to 4.7 volts.

### **Excitation Sources**

All excitation sources are individually regulated and limited to ensure reliable operation even with shorted cables. The standard excitation voltage is 5.0 volts. Excitation sources are not turned on until the software initializes the system during the *Real-Time* or *Collect Data* modes.

### **Electronic Identification (EID)**

The TDAS G5 iPort supports communication with silicon serial number devices manufactured by Dallas Semiconductor/Maxim Integrated Products. When an ID chip such as the DS2401 is connected to the proper pins on the DB25 or DB44 connectors, the TDAS Control software can automatically read these devices and correlate the serial number to channel set-up information stored in a Sensor Information File (SIF). When wiring any device for EID, proper polarity must be observed and cable length should not exceed 9.14 meters (30 feet).

## **Basic Care and Handling**

The TDAS G5 iPort is designed to be reliable and simple to operate. 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 as much as 10,000 Gs. Under these conditions, damage to the exterior and/or interior of the unit is likely.**

When transporting the unit, treat it as you might a laptop computer and you should have no problems. If a TDAS G5 DAS is not installed in the unit, we strongly recommend reattaching the clear plastic cap to cover the opening and protect the connector interface on the unit. 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 system.

**WARNING:**

The 216-position, gold-plated, interface connector on the TDAS G5 iPort should be treated with great care. It is through this interface that all signals enter and exit the DAS. Any debris, solvents, or oil (even from fingers) can compromise the integrity of the connections/signals.

If you feel the interface connector on your TDAS G5 iPort has become contaminated, please contact DTS support before attempting any cleaning procedure.

The TDAS G5 iPort is not user-serviceable and should be returned to the factory for service or repair.

**Shock Rating**

All crashworthy TDAS G5 equipment is rated for and fully tested to 100+ Gs, 12 msec duration, in all axes and can be mounted directly on a vehicle, sled, wall or other dynamic testing device.

**Mounting Considerations**

Mounting methods and mounting bolt selection should be carefully calculated so as to withstand expected shock loading and facilitate proper grounding. (See Appendix B for the unit's mechanical specifications.) Careful consideration should be also given to connecting the D-sub cable harnesses with the TDAS G5 iPort and their movement within a dynamic testing environment. Movement of cable harnesses should be appropriately restricted to ensure testing success.

**Thermal Considerations**

TDAS G5 systems use extensive power management to minimize heat generation. Since the system draws the most power when armed, running the calibrations and arming as late as possible will minimize self-heating.

It is extremely unlikely that excessive heat will ever be an issue in real-world testing applications using TDAS G5 systems. However, if high ambient temperatures, exposure to other heat sources, or severely restricted airflow will cause case temperatures in excess of 50°C (too hot to touch comfortably), the airflow created by a small fan will increase heat transfer by a factor of 3 to 5. Additionally, always shield the units from exposure to direct sunlight.

**Power Management**

A good power source is of paramount importance. Each TDAS G5 iPort should be powered from either:

- 1) A high-quality 15-volt power supply with a current rating of at least 2 amps (this would include the TDAS PLUS Distributor and TDAS PLUS Mini Distributor);

- 2) A fully-charged 12-volt battery with sufficient capacity for the application.

DTS-supplied power supplies and distribution units are designed to meet all criteria for proper charging and operation. If you need help determining which set-up is best for your application or if a power supply or charger will meet the power demands, please contact DTS.

### **Power Consumption**

Power off: When connected to sufficient external power, the unit will draw up to 1/2 mA.

Power on: When a TDAS G5 DAS/iPort system is initially powered, all sensor excitation sources, signal conditioning electronics, filter circuits and analog-to-digital converters are in a shutdown state. The processor and support circuitry are always powered. The processor will remain in a reduced power state when not performing tasks. When the user runs a test set-up, the software automatically energizes the excitation sources and other circuits. The current draw will increase to as much as 1.4 amps when the system is fully armed and powering 350 ohm bridges with 5 volt excitation.

During data collection: Once the system has been armed for data collection, all circuits remain in a full power state until the system finishes storing data. After the data collection routine is complete, the system de-energizes several circuits to minimize power consumption. It takes a maximum of 125 seconds after the end of the data storage window for the system to return to the idle state, which then allows communication and download.

### **External Power Provisions**

The TDAS G5 iPort does not contain any internal power source but has a connector input for primary power.

### **Power-up and Power-down Procedures**

The TDAS G5 iPort is powered up when the proper signal is connected at the DB25 connector. The absence of the same signal will turn off the unit. Power-up of a TDAS G5 DAS/iPort system takes ~20 seconds after which time communication is enabled.

Before restarting a TDAS G5 iPort, wait until all TDAS G5 DAS LEDs go completely dark and then wait 10 seconds more to be sure. An incomplete power-down/power-up cycle can result in errors, so be certain to follow proper procedures.

## **Communication Features**

The DB25 PWR/COM connector on the TDAS G5 iPort connector panel allows access to all communication features and status lines. (Please see Appendix A for connector specifics and pin assignments.)



## Communication Method

The TDAS G5 iPort supports the industry-standard Ethernet 10/100BaseT communication method. The unit itself does not contain an IP-addressable controller; communication is only possible when the unit contains a TDAS G5 DAS. Communication is enabled after the power-up sequence has completed (~20 seconds).

## LED Indicators

As a standalone device, the TDAS G5 iPort does not contain any LED indicators. Ongoing status information is provided via the TDAS G5 DAS (five red/yellow/green LEDs). Please see Appendix A in the TDAS G5 DAS User's Manual for a detailed description of the LED indicators.

COM: Provides status on communications between the PC and DAS.

CAL: Provides calibration status.

PWR: Provides status on power to the DAS.

ARM: Provides arm, start record, and event status.

STAT: Provides general status.

### **WARNING:**

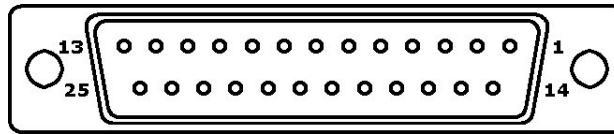
**Do not perform any critical tests when the PWR LED indicator on the TDAS G5 DAS is yellow (power low) or red (power critical). There is no back-up battery within the TDAS G5 iPort.**

## Using Multiple TDAS G5 iPorts

To create higher channel-count systems, TDAS G5 iPorts may be interconnected via a TDAS G5 Distributor, TDAS PLUS Mini Distributor or TDAS PLUS Distributor. All Distributors support communications, with the TDAS PLUS Mini Distributor and TDAS PLUS Distributor also supporting power requirements for the TDAS G5 iPort.

## Appendix A: Connector Information

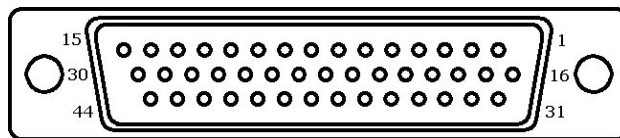
### DB25F PWR/COM Connector (172-025-212-011)



(panel view)

Pin	Function
1	Ground
2	+15 VDC
3	+15 VDC
4	Ethernet Rx (+)
5	Ethernet Rx (-)
6	Ethernet Tx (+)
7	Ethernet Tx (-)
8	Record status output
9	- Event, contact closure to pin 10
10	+ Event, contact closure to pin 9
11	+ ID
12	Ground
13	Ground
14	- ID/Ground
15	- ID/Ground
16	- ID/Ground
17	Start record (contact closure to pin 18)
18	Start record (5 V = start)
19	Arm status input
20	Arm status output
21	Record status input
22	Ground
23	Power on signal (to ground)
24	Ground
25	Ground

**DB44F sensor Connectors**  
(180-044-212-011)



(panel view)

Pin	Function
1	- Ex (Ch 8, 16, 24, 32)
2	+ Sig (Ch 8, 16, 24, 32)
3	- Sig (Ch 7, 15, 23, 31)
4	+ Ex (Ch 7, 15, 23, 31)
5	- Sig (Ch 6, 14, 22, 30)
6	+ Ex (Ch 6, 14, 22, 30)
7	+ Sig (Ch 5, 13, 21, 29)
8	- Sig (Ch 4, 12, 20, 28)
9	+ Ex (Ch 4, 12, 20, 28)
10	+ Sig (Ch 3, 11, 19, 27)
11	- Ex (Ch 2, 10, 18, 26)
12	+ Sig (Ch 2, 10, 18, 26)
13	- Ex (Ch 1, 9, 17, 25)
14	+ Sig (Ch 1, 9, 17, 25)
15	- ID/Ground
16	- ID/Ground
17	- Sig (Ch 8, 16, 24, 32)
18	+ Ex (Ch 8, 16, 24, 32)
19	+ Sig (Ch 7, 15, 23, 31)
20	- Ex (Ch 6, 14, 22, 30)
21	+ Sig (Ch 6, 14, 22, 30)
22	- Sig (Ch 5, 13, 21, 29)

Pin	Function
23	+ Ex (Ch 5, 13, 21, 29)
24	+ Sig (Ch 4, 12, 20, 28)
25	- Sig (Ch 3, 11, 19, 27)
26	+ Ex (Ch 3, 11, 19, 27)
27	- Sig (Ch 2, 10, 18, 26)
28	+ Ex (Ch 2, 10, 18, 26)
29	- Sig (Ch 1, 9, 17, 25)
30	+ Ex (Ch 1, 9, 17, 25)
31	- ID/Ground
32	+ ID (Ch 8, 16, 24, 32)
33	+ ID (Ch 7, 15, 23, 31)
34	- Ex (Ch 7, 15, 23, 31)
35	+ ID (Ch 6, 14, 22, 30)
36	+ ID (Ch 5, 13, 21, 29)
37	- Ex (Ch 5, 13, 21, 29)
38	+ ID (Ch 4, 12, 20, 28)
39	- Ex (Ch 4, 12, 20, 28)
40	+ ID (Ch 3, 11, 19, 27)
41	- Ex (Ch 3, 11, 19, 27)
42	+ ID (Ch 2, 10, 18, 26)
43	+ ID (Ch 1, 9, 17, 25)
44	- ID/Ground

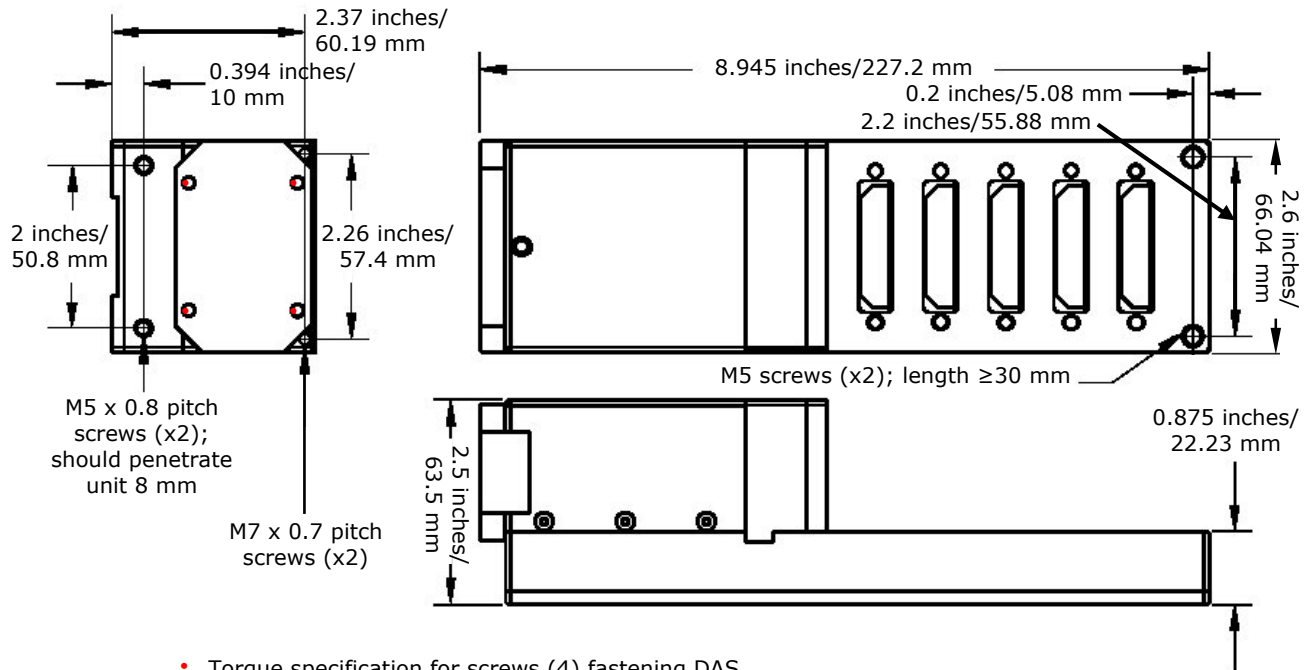
Channels 1-8, 9-16, 17-24, 25-32 are assigned per connector, respectively.

**Suggested Connector Sources**

DTS uses industry-standard D-sub connectors manufactured by NorComp Inc. on the TDAS G5 iPort. If you need to purchase connectors, there are many distributors for these and compatible D-sub connectors including Digi-Key ([www.digikey.com](http://www.digikey.com)), Force Electronics ([www.force-elec.com](http://www.force-elec.com)) and Mouser Electronics ([www.mouser.com](http://www.mouser.com)). Contact information for NorComp Inc. distributors can be found at [www.norcomp.net](http://www.norcomp.net).

## Appendix B: Mechanical Specifications

Weight: 912 grams (TDAS G5 DAS not included)



- Torque specification for screws (4) fastening DAS to unit: 1.6 to 18 Nm or 14 to 16 in-lb

### WARNING:

The torque specification is critical for proper connection of the TDAS G5 DAS (1.6 to 1.8 Nm or 14 to 16 in-lb). If the bolts are tightened too little, good contact will not be made; if they are tightened too much, damage may result. Please use a torque wrench if possible.