



# TSR AIR User's Manual



May 2023

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## DTS Support

TSR AIR 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](https://support.dtsweb.com)). You must be registered ([support.dtsweb.com/registration](https://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:

13000-60401: TSR AIR (8 GB)

13000-60404: TSR AIR (16 GB)

# Introducing the TSR AIR

The TSR AIR is a small high-performance, low power, data logger that can autonomously recognize and capture long and short duration events via built-in sensors. The primary use for the TSR AIR is to collect data in various scenarios while mounted to the interior or exterior of a test article. Captured events can be started by crossing sensor thresholds, or by an external trigger. The device can also collect events based on a date and time or time interval. The device will stay in a low power state when not in use. The units can be daisy chained to share DTS bus signals and synchronization information.

- Shock rated to 500 g for dynamic testing environments.
- Sample rates up to 20,000 sps on 12 channels simultaneously (record in place or data streaming).
- Real-time data streaming up to 20,000 sps per channel.
- 3-channels of low g acceleration, 3-channels of high g acceleration, 3-channels of angular rate, temperature, pressure, and humidity.
- Ethernet PTPv2 communications (IEEE1588) easily supports synchronization of hundreds of channels.
- LED indicators for system and power status.

## Embedded Sensors

The TSR AIR contains independent embedded sensors for low g acceleration, high g acceleration, angular rate, temperature, pressure, and humidity.

### Sensor Sample Rates

The TSR AIR uses the sample clocks on the embedded sensors to collect data at their native rates and then sub- or super-samples that data to match the TSR AIR system rate when storing in flash memory. At a given rate, each individual three axis sensor will record at its own independent rate. For example, with the TSR AIR set to sample at 10,000 sps, the low g sensor will record at 25,600 sps, the high g sensor will record at 5,120 sps, and the ARS will record at 6,400 sps. See the table below for more details.

Sample Rate (SPS)	Low G (SPS)	High G (SPS)	ARS (SPS)
100	25,600	N/A*	100
500	25,600	N/A*	400
1,000	25,600	5120	800
5,000	25,600	5120	6400
10,000	25,600	5120	6400
15,000	25,600	5120	6400
20,000	25,600	5120	6400

\* No data captured for this sensor at this rate.

**NOTE: The environmental sensors (temperature, pressure, and humidity) are collected at 1 sps independent of the TSR AIR system sample rate. This data is super-sampled to the system rate in collected data.**

## Sensor Bandwidths

Like the sample rate considerations in the section above, each individual embedded sensor has its own bandwidth configuration at a given TSR AIR system sample rate. For example, with the TSR AIR set to sample at 10,000 sps, the low g sensor will have a bandwidth of 1 kHz, the high g sensor will have a bandwidth of 640 Hz, and the ARS will have a bandwidth of 178 Hz. See the table below for more details.

Sample Rate (SPS)	Low G (Hz)*	High G (AAF Hz)	ARS (Hz)*
100	10	N/A**	10
500	50	N/A**	38
1,000	100	160	75
5,000	500	640	178
10,000	1,000	640	178
15,000	1,500	640	178
20,000	2,000	640	178

\* Post-ADC filter Hz.

\*\* No data captured for this sensor at this rate.

## Sensor Ranges

Each embedded sensor has its own measurement range capability.

### Low G Acceleration

Can be configured to collect data at a range of 50 g, 25 g, 12 g and 6 g.

### High G Acceleration

Can collect data at a range of 400 g.

### Angular Rate Sensor (ARS)

Can be configured to collect data at a range of 2,000 deg/s or 250 deg/s.

## System Connector



All communications, control signals and input power are provided via the 25-pin, micro-D system connector. Using a TSR AIR Chain Module or other interface, multiple units can be connected (daisy-chained) for hundreds of test channels.

Ethernet signals must be connected in series with a maximum cable length of ~10 m. (Cable quality may affect maximum length and performance.) Control signals must be connected in parallel. See Appendix A for pin assignments.

## Time Synchronization

The TSR AIR supports Ethernet Precision Timing Protocol version 2 (PTPv2) communications (IEEE1588). PTP (Precision Timing Protocol) provides standards for precision clock synchronization for measurement and control systems via Ethernet network

communications. Timing information is extracted from the network's master clock and used by the TSR AIR to adjust their internal (local) clock, providing precision timing for high channel-count systems with a sampling synchronization better than 10 μs. Communication is enabled after the initialization sequence has completed (~15 s after sufficient power and ON signal is applied). (Note network congestion may slow IP address acquisition.)

### Power Management

A good power source is of paramount importance. The TSR AIR should be powered from a high-quality power supply.

Input Voltage	Idle	Ethernet Connected	Armed and Recording
9-30 VDC	<1 W	+0.1 W	<1.9 W

The TSR AIR does contain an internal rechargeable Li-ion battery. Without external power applied, the TSR AIR is in a hibernate state when not armed. When the unit is on (sufficient power and ON signal applied), power consumption depends largely on whether the unit is armed.

### Battery

The TSR AIR contains a rechargeable, 350 mAh Li-ion battery. Battery performance is dependent on its recording state. Please refer to the table below for complete details.

Recording Mode	Arm State (mA)			
	Hibernate	Idle Armed	Motion Armed	Recording
Active	0.013	0.9		20.0
Active (pre-trigger)		7.0		
Active (motion)		0.4	0.9	
Active (motion + pre-trigger)		0.4	7.0	
Active (event to start)		0.4		
Scheduled		0.4		
Scheduled (interval recording)		0.4		
Streaming				

All recording modes use 20 mA when recording. With input power removed, the TSR AIR can operate in the recording state for 17.5 hours with a fully charged battery.

$$\frac{\text{Battery Charge (mAh)}}{\text{TSR AIR Current Draw (mA)}} = \text{Hours of operation}$$

Example: Determine the time available in Idle Arm prior to a scheduled 10 hour recording:

$$\frac{350 \text{ mAh} - (20 \text{ mA} * 10 \text{ hours})}{0.4 \text{ mA}} = 375 \text{ hours (15.6 days)}$$

Example: Determine the time available in Idle Arm assuming the TSR AIR will see 50, 3 s events in Active (event to start) mode:

$$\frac{350 \text{ mAh} - (20 \text{ mA} * 50 * 3 / 60 / 60)}{0.4 \text{ mA}} = 872.9 \text{ hours (36.3 days)}$$

### Power-up and Power-down Procedures







When sufficient power is applied, the TSR AIR will reboot (on, idle and communication enabled) if an ON signal is present. With power applied but the ON signal absent, the unit is in an idle state. Power up (ON state) occurs in ~15 s, after which communication is enabled.

Power down of the unit is immediate upon removal of either the ON signal or external power. Wait ~30 s before reinitialization.

### LEDs

The TSR AIR has two LED indicators that show system and power status.








#### Status (STS) Indicator

	Result
Power up	
Communicating with PC	
Armed	
Unit received Event	
Idle -or- Armed without input power	

- At power up, the LED cycles from red to green to blue followed immediately by the power LED boot-up sequence.
- When not armed, the LED will blink green when handling a command from the PC.
- For Active mode:
  - When armed, the LED will go solid blue to indicate that it is waiting for an EVENT signal or level trigger to occur.
  - When the EVENT signal is received, the LED will turn red to indicate that it is actively recording data.
  - The LED will turn off when data collection has completed.



## Power (PWR) Indicator

	Result
Power up	
Connected to host	
Power up; not connected to host	
Power fault (input power out of range)	
Armed (no input power)	 (once every 60 s)
Charging	 (once every 1 s)

- At power up, the LED cycles from red to green to blue immediately after the status LED has completed its boot-up sequence.
- When connected to host, the LED will turn blue.
- At power up but not connected to host, the LED will turn green.
- When input power is too high or too low, the LED will turn red.

## Data Memory Size

With 8 GB for 13000-60401 and 16 GB for 13000-60404 of flash memory available for data storage, the TSR AIR can record ~277 minutes and ~555 minutes of data, respectively, at the maximum sampling rate (12 channels at 20,000 sps). 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.

## Sampling Rates

User-selectable sampling rates are available from 100 sps to 20,000 sps.

# of Channels*	Maximum Sampling Rate (per channel)
12	20,000 sps

\* All channels are recorded even if they are not programmed.

With 8 GB for 13000-60401 and 16 GB for 13000-60404 available for data storage, there are 4,000 M samples for 13000-60401 and 8,000 M samples for 13000-60404 available (1 sample = 2 bytes). To determine the maximum recording time, divide the number of samples by the product of the sampling rate and the number of channels.

$$\frac{4,000,000,000}{\text{Sampling rate (sps)} \times \# \text{ of channels}} = \# \text{ of seconds}$$

Example: 12 channels of data at 20,000 sps with 8 GB of memory:

$$\frac{4,000,000,000}{20,000 \times 12} = 16,666 \text{ seconds (277 minutes)}$$

Example: 12 channels of data at 20,000 sps with 16 GB of memory:

$$\frac{8,000,000,000}{20,000 \times 12} = 33,333 \text{ seconds (555 minutes)}$$

## Basic Care and Handling

TSR AIR 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 units 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.**

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

### Shock Rating

The TSR AIR is rated for 500 g, 4 ms half-sine duration, in all axes.

### *Mounting Considerations*

TSR AIR equipment should be bolted securely to the test article or dynamic testing device to provide the best shock protection. Mounting methods and hardware selection should be calculated to withstand expected shock loading and facilitate proper grounding. Check bolt tightness periodically to ensure that the unit is securely fastened to the testing platform.

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

### Thermal Considerations

The TSR AIR is a low power device, and it is unlikely that self-heating will be an issue in real-world testing if proper mounting methods are observed. Never mount the unit to a thermally non-conductive surface like wood or plastic. ALWAYS use the TSR AIR with a heat sink if you are not mounting the system to a structure that will serve this purpose. Should you have any questions about using the TSR AIR in your environment, please contact DTS.

### Environmental Rating

The TSR AIR is IP67 rated.

- 6 (solid ingress) = totally protected against dust.
- 7 (liquid ingress) = Protected against the effects of temporary immersion between 15 cm and 1 m. Duration of test 30 minutes.

Care should be taken to prevent prolonged exposure to any potentially harmful environment. Units should be cleaned, dried, and inspected after exposure to any environment that could cause damage.

## Software

DataPRO software is used with the TSR AIR. PC specifications are:

- Windows 10 and later (64-bit versions are supported)
- Microsoft .NET Runtime version 4.5.2
- i5 processor minimum; i7 processor recommended
- 8 GB RAM minimum; 16 GB RAM recommended (more RAM is important for high channel counts and longer/higher sample rates)
- 1 GB disk space for software plus additional storage for test data
- 1366 x 768 minimum screen resolution; 1920 x 1080 recommended

Additionally, DTS recommends a network that supports gigabit Ethernet (GbE).

## Data Collection Concepts

The discussion below provides a general introduction to data collection. Please see the software manual for a detailed discussion and implementation specifics.

The TSR AIR is a standalone data logger. Once the system is armed, the PC can be disconnected if desired. After receiving an event signal, level trigger, or scheduled/interval event, the TSR AIR autonomously collects data, storing it to flash memory with no user interaction. After the test, the user reconnects the PC to download the data.

There is also a real-time mode in the control software that allows the user to check channel inputs on an oscilloscope-looking screen. (This data can be logged.)

## Data Collection Modes

The TSR AIR supports two data collection modes: Active and Scheduled. (Note: The software cannot simultaneously display the data while the system is recording.)

### **Active Mode**

Using this mode, the user can program the TSR AIR to record pre- and post-event data. Time Zero (T=0) is marked when the event signal is received. The maximum pre-event data is .0512 s. There are three options for this mode:

- Level triggers: Only available when “start record with event line” is not used.
- Start record with event line: Pre-event data not available with this option. This is the lowest power option.
- Wake up with motion: The TSR AIR will wake up when sensing motion.

### **Scheduled Mode**

Using this mode, the user can program the TSR AIR to record at a scheduled time (UTC) or interval (in minutes). Pre-event data is not available when using this mode.

#### **NOTE:**

**An event or trigger signal applied anywhere in the TSR AIR chain is distributed throughout the chain.**

### **Data Streaming**

Real-time data streaming up to 20,000 sps using IRIG Chapter 10 is supported via DataPRO software. Please see the software manual for additional information, including how to create a test set-up.

### **Start Record and Event Initiation**

The TSR AIR supports multiple methods of initiating event signals. Typically, event signals are initiated via an external hardware interface that provides a discrete contact closure (CC) signal to mark T=0.

All TSR AIR data collection modes support multi-event arming. A unit armed in a multiple-event mode will re-arm when an event completes. The unit will stop re-arming when the number of events specified by the user has been recorded or a disarm command is issued to the device.

Additionally, Active mode supports level triggering. This method continuously samples the incoming data and begins data collection if the data is above or below predefined levels. For example, it might be useful to begin data collection when a certain accelerometer experiences a force above 200 g. Using level trigger and Active mode, the TSR AIR can support this or any level-trigger signal on the high g channels only.

#### **CAUTION:**

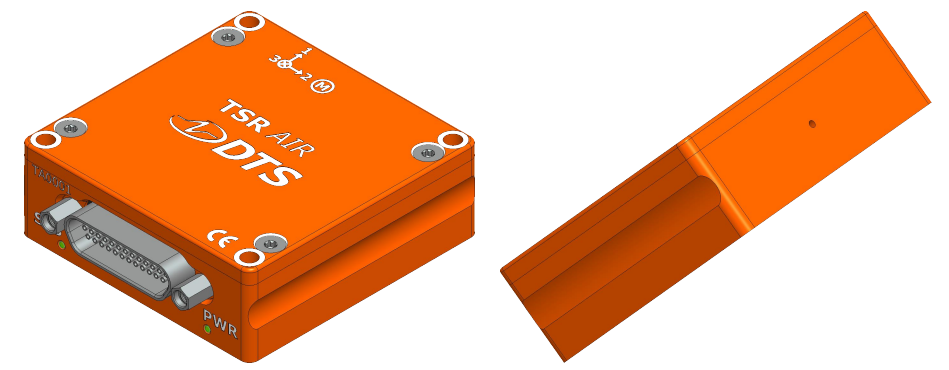
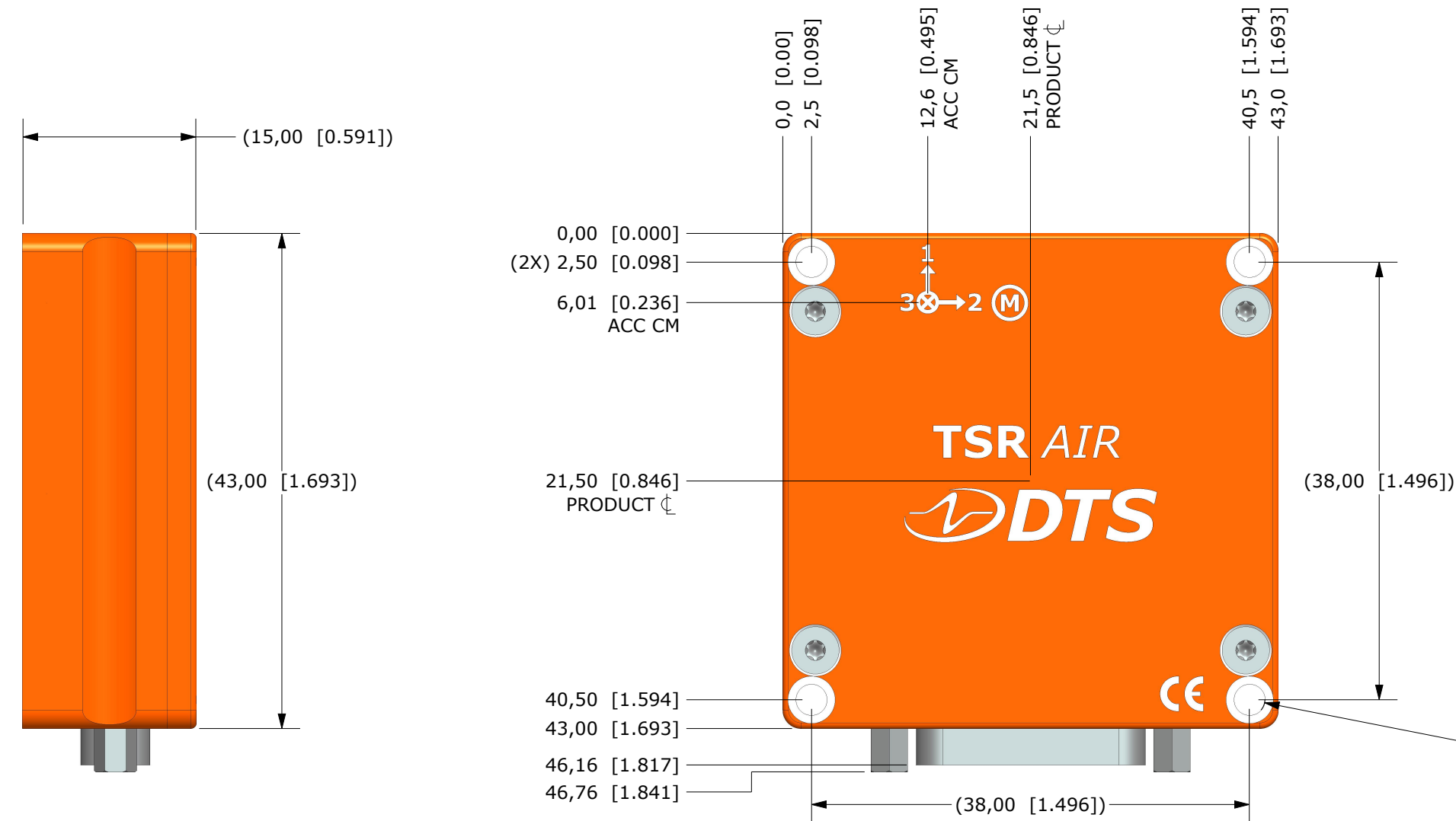
**Level trigger is NOT recommended when the TSR AIR is used for destructive testing.**

Finally, if the TSR AIR remains connected to the PC during data collection, the control software can be used to initiate data collection.

**INTELLECTUAL PROPERTY STATEMENT**  
 This drawing contains information that is the property of Diversified Technical Systems, Inc. (DTS). All copyright, patent, and ownership rights are retained. This information shall not be disclosed, reproduced in whole or in part, or used for manufacture without prior written consent from DTS.

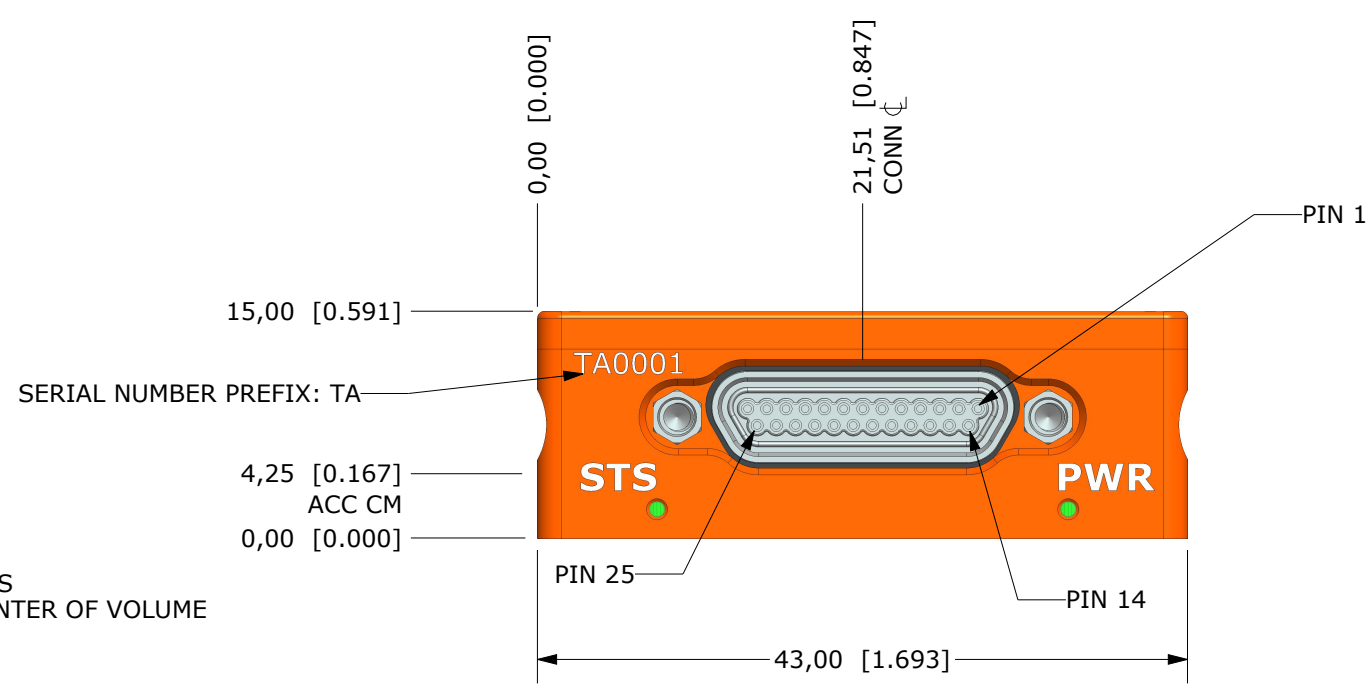
**RoHS**  
 Manufacture/fabricate to meet the EU RoHS Directive 2011/65/EU and RoHS Annex II phthalates

REV	ZONE	DESCRIPTION	DATE	BY
0		ORIGINAL RELEASE	2021-08-30	AH
1		UPDATED ARTWORK	2022-05-12	AH



SCALE 1:1

PIN	SIGNAL
1	+PWR
2	+PWR
3	+PWR
4	GND
5	GND
6	TX_2_P
7	TX_2_N
8	RX_2_P
9	RX_2_N
10	TX_1_P
11	TX_1_N
12	RX_1_P
13	RX_1_N
14	#ON
15	#START
16	#EVENT
17	STATUS
18	UART_RX_P
19	UART_RX_N
20	UART_TX_P
21	UART_TX_N
22	GND
23	GND
24	IRIGB
25	PPS



- NOTES:**
- 1) ACC CM = ACCELEROMETER CENTER OF MASS
  - 2) TSR AIR MASS CG IS APPROXIMATELY AT CENTER OF VOLUME
  - 3) MOUNT USING (4X) M2.5 SCREWS
  - 4) TORQUE TO 3.7 IN-LB CLEAN AND DRY
  - 5) CONNECTOR: OMNETICS P/N A99108-025
  - 6) MASS: 45 ± 5g

SEAL BEACH, CA 90740 562-493-0158 www.dtsweb.com	DESCRIPTION: <b>TSR AIR, MOUNTING DRAWING</b>	
	DTS P/N: <b>13000-604XX</b>	REV: <b>1</b>
MATERIAL: <b>6061-T6 ALUMINUM W/ INTERNATIONAL ORANGE ANODIZE</b>	DRAWN: <b>A HAMDAN</b>	
UNLESS OTHERWISE SPECIFIED:	DATE: <b>2021-08-30</b>	SCALE: <b>1:1</b>
UNITS = MM [INCH] DIMENSIONAL TOLERANCES ±.254 [0.010"] INTERPRET PER ASME Y14.5. DO NOT SCALE.	SIZE: <b>B</b>	SHEET: <b>1 OF 1</b>

## Ethernet Chaining

To share Ethernet communications, chain TSR AIR units together using the methodology in the table below.

TSR AIR #1		TSR AIR #2		TSR AIR #3	
Function	Pin	Function	Pin	Function	Pin
		TX_2_P	6	RX_1_P	12
		TX_2_N	7	RX_1_N	13
		RX_2_P	8	TX_1_P	10
		RX_2_N	9	TX_1_N	11
TX_2_P	6	RX_1_P	12		
TX_2_N	7	RX_1_N	13		
RX_2_P	8	TX_1_P	10		
RX_2_N	9	TX_1_N	11		

## Accessories/Support Equipment

- 13006-90460: SLICE6 AIR/TSR AIR Chain Module<sup>1</sup>
- 13000-30541: Power supply; 12 VDC, 2.5 A (90-240 VAC in, Molex term)
- 13000-31490: Cable, SLICE EOC Interface to TSR AIR SYSTEM port (Micro-D 25)
- 13000-60500: TSR AIR End-of-Chain Device Cable Kit
- 13000-60501: SLICE6 AIR DAS/TSR AIR Test Device Cable Kit
- 13000-60530: Cable, 2 TSR AIR daisy chain (2 ft) to EOC (1.5 ft)
- 13006-90820: Cable, 2 TSR AIR daisy chain (6") to SYSTEM pigtails (18")
- 13006-90840: SLICE6 AIR DAS/TSR AIR Test Device

<sup>1</sup> To connect individual chain modules (P/N 13006-90460) to each other, the standoffs on the socket side must be removed. Retain the screws for future use.

## Appendix B: Hardware Configuration Specifications

The TSR AIR is typically delivered with a default IP address as follows:

IP address	192.168.4. <b>xx</b> where <b>xx</b> is based on the last two digits of the S/N; for example: S/N TA00 <b>47</b> = 192.168.4. <b>47</b> S/N TA02 <b>33</b> = 192.168.4. <b>33</b>
Netmask	255.255.248.0

The calibration data for your equipment identifies the IP address as shipped from the factory. If the calibration data is not available, try using the default address described in the table above.

If you need information on the specifics of your equipment, please submit a request through the DTS Help Center web portal ([support.dtsweb.com](http://support.dtsweb.com)) and include the serial number(s) of the equipment and parameters you are asking about.

### Using the SLICE Network Configuration Utility

The *SLICE Network Configuration Utility* (available from the DTS Help Center) can be used to view or change the unit's IP address.

Use of the utility requires a network that supports multicast and the workstation running the utility must also allow it. Confirm that:

- The PC's Ethernet properties are not using anything that can block multicast; e.g., *DNE LightWeight Filter*.
- The Windows Firewall will allow multicast traffic.
- Any third-party anti-virus software will allow multicast traffic.

1. Open the *SLICE Network Configuration Utility*.





- The software will immediately look for all attached devices and list them in the table. (You may also click  to refresh the list.)

The screenshot shows a window titled "SLICE\_NetworkConfigurationUtility" with a "Discover" button and a dropdown menu for "(Windows Selected Route)". Below this is a table with columns: Serial, DevClass, Mac, Dhcp, Ip, Subnet, Gateway, Dns, Connected, Connectedip, and Connected. A box labeled "Current IP address" points to the "Ip" column of the first row. Below the table are "Identify" and "Reboot" buttons, and a "Settings" section with fields for MAC, DHCP, Fallback IP, Fallback Subnet, and Fallback Gateway, each with a "Set" button and a "Refresh" button.

Serial	DevClass	Mac	Dhcp	Ip	Subnet	Gateway	Dns	Connected	Connectedip	Connected
SL60267	Slice6	00:19:9B:00:92:0B	<input type="checkbox"/>	192.168.1.98	255.255.248.0	192.168.0.1	0.0.0.0	<input type="checkbox"/>		
SL60020	Slice6	00:19:9B:00:90:2D	<input type="checkbox"/>	192.168.4.165	255.255.248.0	192.168.0.1	0.0.0.0	<input type="checkbox"/>		
SL60266	Slice6	00:19:9B:00:93:3D	<input type="checkbox"/>	192.168.1.99	255.255.248.0	192.168.0.1	0.0.0.0	<input type="checkbox"/>		
S6DB00SW	S6DB	00:19:9B:00:02:40	<input type="checkbox"/>	192.168.4.101	255.255.248.0	192.168.0.1	0.0.0.0	<input type="checkbox"/>		
PPRO554	PowerPro	00:19:9B:00:02:41	<input type="checkbox"/>	192.168.4.41	255.255.248.0	192.168.0.1	0.0.0.0	<input checked="" type="checkbox"/>	192.168.3.19	edward-poo
SL60331	Slice6	00:19:9B:00:92:4B	<input type="checkbox"/>	192.168.3.81	255.255.248.0	192.168.0.1	0.0.0.0	<input type="checkbox"/>		
SL60612	Slice6	00:19:9B:00:93:64	<input checked="" type="checkbox"/>	192.168.3.17	255.255.248.0	192.168.0.1	0.0.0.0	<input checked="" type="checkbox"/>	192.168.4.219	GREGLAP
SL60372	Slice6	00:19:9B:00:92:74	<input type="checkbox"/>	192.168.3.250	255.255.252.0	192.168.0.1	0.0.0.0	<input type="checkbox"/>		
SL60166	Slice6	00:19:9B:00:91:A6	<input checked="" type="checkbox"/>	192.168.3.103	255.255.248.0	192.168.0.1	0.0.0.0	<input type="checkbox"/>		
SL60171	Slice6	00:19:9B:00:91:AB	<input checked="" type="checkbox"/>	192.168.3.32	255.255.248.0	192.168.0.1	0.0.0.0	<input type="checkbox"/>		

Note: Clicking on  for any selected device will cause the unit's LED to flash.

- Select the TSR AIR device from the list. The device Settings are shown at the bottom of the window. The current IP address may or may not match the fallback IP address, depending on whether DHCP is selected.

The screenshot shows the "Settings" panel for a device. It includes a "Refresh" button and a "DHCP" checkbox which is checked. Below are fields for "Fallback IP" (192.168.4.100), "Fallback Subnet" (255.255.248.0), and "Fallback Gateway" (192.168.0.1), each with a "Set" button. The MAC address is 00:19:9B:00:02:32.

The screenshot shows the "Settings" panel for a device. It includes a "Refresh" button and a "DHCP" checkbox which is unselected. Below are fields for "Fallback IP" (192.168.1.99), "Fallback Subnet" (255.255.248.0), and "Fallback Gateway" (192.168.0.1), each with a "Set" button. The MAC address is 00:19:9B:00:92:0B.

4. To enable DHCP, select the check box then select **Set** . Proceed to step 7.

Settings  
 Fallback network settings are used when DHCP is disabled or if the device fails to acquire a DHCP lease.  
 MAC: 00:19:9B:00:90:06 Refresh  
 DHCP Set

5. To disable DHCP and manually enter IP address and other information, unselect the check box.

Settings  
 Fallback network settings are used when DHCP is disabled or if the device fails to acquire a DHCP lease.  
 MAC: 00:19:9B:00:92:0B Refresh  
 DHCP Set

6. Enter the new parameters and select **Set** for each item updated. (Note: The MAC address is not user configurable.)

Settings  
 Fallback network settings are used when DHCP is disabled or if the device fails to acquire a DHCP lease.  
 MAC: 00:19:9B:00:92:0B Refresh  
 DHCP Set  
 Fallback IP: 192.168.6.102 Set  
 Fallback Subnet: 255.255.255.0 Set  
 Fallback Gateway: 192.168.0.254 Set

7. Select **Refresh** to view the settings (optional), then **Reboot** the device.

Identify Reboot

Settings  
 Fallback network settings are used when DHCP is disabled or if the device fails to acquire a DHCP lease.  
 MAC: 00:19:9B:00:92:0B Refresh  
 DHCP Set



1720 Apollo Court  
Seal Beach, CA 90740 USA  
+1 562 493 0158  
[www.dtsweb.com](http://www.dtsweb.com)

## DECLARATION OF CE CONFORMITY

Description	Model
Data Logger	TSR AIR

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**

A blue ink handwritten signature, appearing to be 'Rollin White', is written over a horizontal line.

Rollin White  
Head of DTS, Senior Director

March 13, 2023  
Date

### Revision History

Rev	Date	By	Description
0	13 Mar 2023	C. Balogh	Initial DRAFT.
1	21 Mar 2023	T. Ralston	Updated battery table to include current draw while armed.
2	27 Apr 2023	C. Balogh	Added equation to calculate recording duration given battery charge and current draw.
3	17 May 2023	C. Balogh	Added Note to table, bottom of page 5.