CHECK WIRING HARNESS BEFORE INSTALLATION

It's easier/cheaper to check and recheck all harness's and connections than repairing them later!

TAS 1000
INSTALLATION PROCEDURES

DOCUMENT 1000-402      DATE: DEC 10, 2010 REV.H

PLEASE READ INSTRUCTIONS COMPLETELY BEFORE PROCEEDING WITH INSTALLATION

Instrument Corp.
Box 122
Fort Erie
Ontario
L2A 5M6
Table of Contents

1. PLANNING THE INSTALLATION | 2
1.1 TAS SYSTEM INSTALLATION OPTIONS | 2

2. HARDWARE INSTALLATION | 3
2.0 INSTALL TAS WIRING | 3
2.1 INSTALLING THE TAS 1000 AIR DATA COMPUTER | 3
2.2 INSTALLING THE WINDICATOR | 3
2.3 CONNECTING POWER AND GROUND | 3
2.4 INSTALLING THE OAT (Outside Air Temperature) SENSOR | 3
2.5 INSTALLING THE EXPANSION MODULE | 3
2.6 INSTALLING THE FUEL FLOW SENSOR(S) | 3
2.7 CONNECTING TO A HEADING SYSTEM | 4
2.8 CONNECTING TO AN ALTIMETER | 4
2.9 CONNECTING TO A GPS | 4
2.10 CONNECTING TO A PITOT/STATIC SYSTEM | 4

4.0 TAS DEALER MODE SETUP | 4
4.1 SINGLE/TWIN ENGINE | 5
4.2 FUEL UNITS | 5
4.3 FUEL TYPE | 5
4.4 SYNCHRO | 5
4.5 BAROMETER SETTING CALIBRATION 31 | 6
4.6 BAROMETER SETTING CALIBRATION 28 | 6
4.7 MFO (Maximum Fuel Onboard) | 7
4.8 FUEL FLOW CALIBRATION (KL for left engine/single engine) | 7
4.9 FUEL FLOW CALIBRATION (KL for right engine/single engine) | 7
4.10 AWB (Alert Warning Band) | 7
4.11 TAS RS-232 TRANSMIT FORMATS | 7,8
4.12 EXIT DEALER MODE | 9

5.0 INSTRUCTIONS FOR GARMIN 400/500 SERIES SOFTWARE SETUP | 9
5.1 FINAL ACCEPTANCE TEST | 9
5.2 FLIGHT CHECK | 9
5.3 TAS SERVICE | 10
5.4 TAS-1000 Data Sources | 11

INSTALLATION DRAWINGS | 12-27
PLANNING THE INSTALLATION

The TAS 1000 Air Data System interconnects with several existing aircraft systems. Full implementation requires connection with: Electrical system, Pitot/Static system, OAT probe, slaved heading system, fuel flow sensors, altimeter, and GPS.

Note that the TAS 1000 contains an ambient light sensor for automatic brightness control and so requires no connection to aircraft lighting bus. Read all installation instructions and examine the aircraft to determine existing aircraft equipment.

1.1 TAS SYSTEM INSTALLATION OPTIONS

<table>
<thead>
<tr>
<th>OPTIONS</th>
<th>REQUIREMENTS</th>
<th>RESULTS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FUEL FLOW</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. INSIGHTS FUEL FLOW SENSOR</td>
<td>CONNECT TAS TO INSIGHT FUEL FLOW SENSOR</td>
<td>TAS WILL PROVIDE FUEL DATA</td>
</tr>
<tr>
<td>B. AC SINEWAVE FUEL FLOW SENSOR</td>
<td>CONNECT TAS TO EXISTING AC SINEWAVE FUEL FLOW SENSOR AND INSTRUMENT</td>
<td>TAS WILL PROVIDE FUEL DATA AS BACK-UP TO EXISTING INSTRUMENT</td>
</tr>
<tr>
<td>C. FLOWSCAN 201B AND EXISTING INSTRUMENT</td>
<td>CONNECT TAS TO EXISTING 201B FUEL FLOW SENSOR AND INSTRUMENT</td>
<td>TAS WILL PROVIDE FUEL DATA AS BACK-UP TO EXISTING INSTRUMENT</td>
</tr>
<tr>
<td>D. FLOWSCAN 201B ONLY</td>
<td>CONNECT TAS TO EXISTING 201B FUEL FLOW SENSOR ONLY</td>
<td>TAS WILL PROVIDE FUEL DATA</td>
</tr>
<tr>
<td>E. TF 500 FUEL SENSOR</td>
<td>CONNECT TF500 FUEL INPUTS AS SHOWN</td>
<td>TF500 WILL PROVIDE FUEL FUNCTIONS TO A GPS</td>
</tr>
<tr>
<td>F. NONE</td>
<td>CONNECT TAS FUEL FLOW INPUTS TO GROUND</td>
<td>NO FUEL FUNCTIONS AVAILABLE</td>
</tr>
</tbody>
</table>

**COMPASS**

<table>
<thead>
<tr>
<th>OPTIONS</th>
<th>REQUIREMENTS</th>
<th>RESULTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. NO COMPASS SYSTEM</td>
<td>IF NO HEADING SOURCE IS AVAILABLE</td>
<td>PILOT MUST ENTER HEADING CHANGES ON TAS</td>
</tr>
<tr>
<td>B. SYNCHRO (SLAVED DG/HSI)</td>
<td>WIRE TAS SYNCHRO INPUTS TO AIRCRAFT X, Y, Z AND 400 HZ REF.</td>
<td>TAS WILL UTILIZE HEADING FROM COMPASS.</td>
</tr>
<tr>
<td>C. STEPPER (KING HSI)</td>
<td>CONNECT TAS SA, SC INPUTS TO HSI OUTPUTS AS SHOWN.</td>
<td>AS ABOVE, BUT PILOT WILL PERIODICALLY CHECK AND RESET TAS HEADING.</td>
</tr>
</tbody>
</table>

**BARO SETTINGS**

<table>
<thead>
<tr>
<th>OPTIONS</th>
<th>REQUIREMENTS</th>
<th>RESULTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. BARO-OUTPUT ALTIMETER</td>
<td>CONNECT ALTIMETER BARO-OUTPUT TO TAS INPUT PINS. (400 HZ REF. REQUIRED)</td>
<td>TAS WILL ACQUIRE BARO-SETTING FROM THE ALTIMETER</td>
</tr>
<tr>
<td>B. NONE</td>
<td>CONNECT TAS BARO INPUT PINS TO GROUND</td>
<td>PILOT MUST SET BARO ON TAS</td>
</tr>
</tbody>
</table>
2. HARDWARE INSTALLATION

2.0 INSTALL TAS WIRING

Install all wiring in accordance with AC 43.13-1B Chapter 11 Section 8, 11-96, 11-97, 11-98, 11-100, 11-104, 11-105, 11-106, and 11-107.

2.1 INSTALLING THE TAS 1000 AIR DATA COMPUTER

Select a suitable panel location for the TAS 1000. Avoid locations subject to direct sunlight. Check for accessibility to the pitot/static and all other required systems. Use existing or create a panel hole in accordance with Insight Drawing #1000-304 (PANEL CUT-OUT).

Mount TAS 1000 using four supplied screws (or similar).

2.2 INSTALLING THE WINDICATOR

The Insight Windicator displays the TAS 1000’s real-time wind aloft data in graphical format. It may be mounted in any convenient location. Mount the Windicator in accordance with Insight Drawing #1000-305 (WINDICATOR MOUNTING DIAGRAM). Terminate in accordance with Insight Drawing #1000-301 Page 1 (TAS 1000 INSTALLATION SCHEMATIC).

2.3 CONNECTING POWER AND GROUND

Using Insight supplied connector and installer supplied circuit-breaker connect to aircraft avionics bus in accordance with Insight Drawing #1000-301 Page 1.

2.4 INSTALLING THE OAT (Outside Air Temperature) SENSOR

Select a suitable location on the exterior of the aircraft for the OAT sensor. Choose a location on the belly of the aircraft avoiding vents, exhaust, or any feature that may interfere with sensing ambient air temperature. Mount the sensor in accordance with Insight Drawing #1000-302 (OAT MOUNTING DIAGRAM). Terminate the OAT cable in accordance with Insight Drawing #1000-301 Page 1.

2.5 INSTALLING THE EXPANSION MODULE (Altitude Encoder & Over-speed Indicator)

Select a suitable location for the EXPANSION MODULE. Choose a location inside the aircraft avoiding radio transmitters, antennas or any feature that may induce RF noise within the EXPANSION MODULE. Avoid installation in places that may become extremely hot during operation. Mount the sensor in accordance with Insight Drawing #1000-302 (EXPANSION MODULE MOUNTING DIAGRAM). Terminate the EXPANSION MODULE cable in accordance with Insight Drawing #1000-301 Page 4.

2.6 INSTALLING THE FUEL FLOW SENSOR(S)

Aircraft without existing FF sensors should have one Insight supplied sensor installed per engine. Existing compatible FF sensors may be connected directly to the TAS 1000. Install new sensors in accordance with Insight Drawing #1000-303 (FUEL FLOW/TF SENSOR MOUNTING DIAGRAM). Use Insight Drawing #1000-301 page 2 to cable and terminate Fuel Flow Sensor #1000-004. Use Insight Drawing #1000-816 to cable and terminate TF500 Sensor #1000-006. Refer to AC 43.13-1B, Chapter 8 Section 2, 8-30, 8-31, 8-37, 8-38. Fuel flow case must be connected to airframe ground.

NOTE: TF500 Sensor needs to be connected to a GPS and can operate independently from TAS 1000 system.
2.7 CONNECTING TO A HEADING SYSTEM (synchro system preferred)

TAS 1000 should be connected to either a slaved synchro compass system OR a digital stepper heading system (KCS-55). Autopilot outputs are usually not compatible. Aircraft not equipped with slaved heading systems will require the pilot to manually input heading data to the TAS 1000. Refer to Insight Drawing #1000-301 Page 1 for termination.

2.8 CONNECTING TO AN ALTIMETER (Baro setting)

TAS 1000 may be connected to an altimeter to automatically receive barometer-correction (altimeter setting). Aircraft not equipped with barometer-setting output altimeters will require the pilot to manually input altimeter setting to the TAS 1000. Terminate in accordance with Insight Drawing #1000-301 Page 1. Note that if connection is made to an altimeter, the TAS 1000 barometer setting MUST be calibrated using the TAS 1000 DEALER MODE.

2.9 CONNECTING TO A GPS

TAS 1000 should be connected to a GPS. See the DEALER MODE section for compatible GPS models. Cable and terminate in accordance with Insight Drawing #1000-301 Page 1. Note that the serial protocol configuration is required using the TAS 1000 DEALER MODE.

3.0 CONNECTING TO A PITOT/STATIC SYSTEM

Connect the TAS 1000 to a PITOT/STATIC system using the Insight supplied air fitting or equivalent. Installer must supply approved tubing. Refer to AC 43.13-1B Chapter 12 Sections 1, 12-1, 12-2, Section 2, 12-8, 12-9, 12-19, 12-20, Section 4, 12-51. Make all connections to provide for moisture drainage. Aircraft equipped with Primary-Secondary Pitot/Static systems should have the TAS 1000 connected to the Secondary system. Perform a leak check prior to flight tests.

4.0 TAS DEALER MODE SET-UP

DEALER MODE allows access to the following configuration items:
- Single/Twin Engine
- Fuel Units - Pounds/Gallons/Liters
- Aviation gasoline - yes or no
- Synchro – Synchro or HSI input
- Baro 31 - Baro-pot input calibration 31 inches of Hg
- Baro 28 - Baro-pot input calibration 28 inches of Hg
- M.F.O. - Maximum fuel on board (gallons)
- KL - Single or left engine (pulses/gallon AC mode)
- KR - Right engine K factor (pulses/gallon AC mode)
- A.W.B. - Altitude Alert warning band (feet)
- RSOUT - RS - 232 output mode C, D, F, Z or G

EXIT

Start the TAS 1000 in DEALER MODE by pushing and holding the selector while applying power. The TAS 1000 will initially show “CONFIG”, continue holding the selector for approximately 20 seconds or until the TAS 1000 shows “DEALER”, then release selector.
4.1 Single/Twin Engine

The TAS 1000 default will show “SINGLE N”. For twin-engine aircraft push the selector to accept the default and advance the display to the next item. For single engine aircraft, turn the selector to show “SINGLE Y”. Push the selector to accept this selection, and advance the display to the next configuration item.

4.2 Fuel Units

The TAS 1000 allows you to select between gallons or pounds. To select a measurement unit, turn the selector to show “FUEL GAL OR FUEL LB”. Push to accept and proceed to next item.

4.3 Fuel Type (aviation gasoline or jet fuel)

**default NO**
For piston engine(s), select yes.
For turboprop and jet engine(s), select no.

4.4 SYNCHRO (YES or NO)

**default YES**
If connected to a synchro compass select yes.
For all others select no.

4.5 Barometer Setting Calibration 31 inches of Hg

**default NO**
The TAS 1000 Barometer Setting (Altitude Setting) must be calibrated if the TAS 1000 is connected to an altimeter’s Barometer Setting output.
To calibrate, set altimeter to 31.00 inches Hg and turn the TAS 1000 selector to show “BARO31 Y”. Push the selector to accept the setting. Failure to obtain a “BARO31 Y” display indicates an invalid barometer signal.
Push the selector twice to omit this feature and proceed to next item.

4.6 Barometer Setting Calibration 28 inches of Hg

**default NO**
Set the altimeter to 28.00 inches Hg. The TAS 1000 shows “BARO28 N”. Turn the TAS 1000 selector to display “BARO28 Y” and push the selector to accept the setting. Failure to obtain a “BARO28 Y” display indicates an invalid Barometer signal.
4.7 Maximum Fuel on Board MFO

default 50 gallons
Dealer enters the maximum fuel on board available for that model of aircraft (gallons).

4.8 Fuel Flow Calibration (KL Left/Single Engine)

default 30000 pulses/gallon (AC mode)
For AC mode:
The TAS 1000 must be programmed with the correct K value for each connected fuel flow sensor. Fuel flow sensors differ in their sensitivity (K value expressed in Pulses per Gallon). The TAS 1000 can operate with K values ranging from 1000 to 99900. Insight supplied sensors come with nominal K values of 30000 (leave K value at 30000 for Insight supplied sensors). Sensors from other suppliers do not.
Turn the TAS 1000 selector to show the correct K value for the installed sensor on engine one, and push the selector to accept the value and proceed to the next item.

4.9 Fuel Flow Calibration (KR for Right Engine)

default 30000 pulses/gallon (AC mode)
For AC mode:
The TAS 1000 must be programmed with the correct K value for each connected fuel flow sensor. Fuel flow sensors differ in their sensitivity (K value expressed in Pulses per Gallon). The TAS 1000 can operate with K values ranging from 1000 to 99900. Insight supplied sensors come with nominal K values of 30000 (leave K value at 30000 for Insight supplied sensors). Sensors from other suppliers do not.
Turn the TAS 1000 selector to show the correct K value for the installed sensor on this engine, and push the selector to accept the value and proceed to the next item.

4.10 Altitude Warning Band AWB

default 300 feet
Enter altitude-warning band setting for altitude alert function.

4.11 RS-232 TRANSMIT FORMAT

default C
Turn the selector knob to format D, F, G or Z as appropriate for the connected GPS.

The TAS 1000 is compatible with the following GPS types;

<table>
<thead>
<tr>
<th>GPS MANUFACTURER</th>
<th>MODEL</th>
<th>TAS TRANSMIT FORMAT</th>
</tr>
</thead>
<tbody>
<tr>
<td>BENDIX/KING</td>
<td>KLN89/B</td>
<td>C OR D</td>
</tr>
<tr>
<td>BENDIX/KING</td>
<td>KLN90/B</td>
<td>C OR D</td>
</tr>
<tr>
<td>GARMIN</td>
<td>400/500 SERIES</td>
<td>G OR Z</td>
</tr>
<tr>
<td>APOLLO</td>
<td>GX SERIES</td>
<td>Z</td>
</tr>
</tbody>
</table>
### TAS RS-232 Transmit Formats:

<table>
<thead>
<tr>
<th>Data Type</th>
<th>C</th>
<th>D</th>
<th>F</th>
<th>G</th>
<th>Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Fuel Remaining</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>Total FF Rate</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td>Engine 1 FF Rate</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Engine 2 FF Rate</td>
<td>YES</td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Total Fuel Used</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td>Engine 1 Fuel Used</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Engine 2 Fuel Used</td>
<td>YES</td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>IAS Knots</td>
<td>YES</td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>TAS Knots</td>
<td>YES</td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Mach Number</td>
<td>YES</td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Pressure Altitude (FT)</td>
<td>YES</td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Density Altitude (FT)</td>
<td>YES</td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Total Air Temperature (°C)</td>
<td>YES</td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Wind Direction (°M)</td>
<td>YES</td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Wind Speed (KNOTS)</td>
<td>YES</td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Drift (DEGREES)</td>
<td>YES</td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>Rate Change of Altitude (FT / MIN)</td>
<td>YES</td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Heading (°M)</td>
<td>YES</td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Static Air Temperature (°C)</td>
<td>YES</td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Baro-Setting (INCHES Hg)</td>
<td>NO</td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>Baro-Corrected Altitude</td>
<td>NO</td>
<td>YES</td>
<td>NO</td>
<td>YES</td>
<td>NO</td>
</tr>
<tr>
<td>Fuel Measurement Units</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>NO</td>
<td>NO</td>
</tr>
</tbody>
</table>

**NOTE:** TAS RS-232 receives “Aviation Format” for format.

**NOTE:** For GPS types not listed contact Insight Technical Support.

Turn the TAS 1000 selector to indicate the required code and push the selector to accept. GPS must also be set-up to communicate with TAS. (See sec. 4)

See GPS manual.

### 4.12 EXIT DEALER MODE

Push the TAS 1000 selector to switch from DEALER MODE to NORMAL MODE.
5.0 INSTRUCTIONS FOR GARMIN 400/500 SERIES SOFTWARE SET UP:

1) To start set up mode.
   Press and hold “ENT” button and apply power.
   Hold “ENT” until “OK” message appears.
   Release “ENT” button.
   Momentary press “ENT” button once.

2) Turn inner rotary knob until “Main RS-232 Config” appears.

3) Use cursor and “ENT” button to select:

<table>
<thead>
<tr>
<th>INPUT</th>
<th>OUTPUT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Channel 1</td>
<td>Shadin – fadc</td>
</tr>
</tbody>
</table>

4) Turn power off.

5.1 FINAL ACCEPTANCE CHECK LIST

All aircraft systems connected to the TAS 1000 must also be checked for correct operation.
Refer to AC 43.13-1B Chapter 12 Sections 1, 2, 3, 4 - 12-1, 12-8, 12-9, 12-17, 12-19, 12-20, 12-37.
The Pitot/Static system should be checked for leaks prior to flight test. Refer to the TAS 1000 Operating Instructions and conduct a ground check and a test flight before returning the aircraft to service.

GROUND CHECK
1. POWER-ON TAS.
2. WINDICATOR ALL-LED CHECK / WALKING DOT MODE.
3. TAS INITIAL DATA ENTRY (BR / HEADING / FUEL)
4. CHECK TAS AUTO-BRIGHT / DIM FUNCTION.
5. CROSS-CHECK EACH DATA ITEM ON THE TAS CONFIG LIST AGAINST ANOTHER DATA SOURCE.

NOTE: WINDICATOR DATA ONLY AVAILABLE WITH AIRCRAFT IN FLIGHT.

5.2 FLIGHT CHECK

ONLY AFTER SUCCESSFULLY COMPLETING GROUND CHECK.
REPEAT ALL GROUND DATA INDICATIONS.
TAS FUEL FLOW INDICATIONS.
TAS ALTITUDE.
TAS VERTICAL SPEED.
WINDICATOR.
TAS WINDS ALOFT DATA.
5.3 TAS SERVICE

1. The TAS-1000 system should have a long service life and can be used indefinitely on-condition. Insight recommends periodic testing and calibration of the TAS-1000 system every 2 years to ensure continued accuracy and precision.

2. In the unlikely event of operational difficulties during flight, flight crew should turn-off the TAS-1000 system by pulling the circuit-breaker, and report the incident to maintenance personnel. Refrain from further use of the TAS-1000 system in-flight until any service issues are resolved.

3. The TAS-1000 is dependent on internal and external sensors for data measurements and all resulting calculations. In the event that a data type is not available, the TAS-1000 display will show "N/A" or "-----".

4. The core of the TAS-1000 is the pitot/static measurement system with internal, temperature-controlled sensors. Air data will achieve best accuracy after the sensors stabilize at their design operating temperature of 45 degrees C which may require up to ten minutes after power-up. Select the "OV" data type with the selector knob to display the sensor temperature. The TAS-1000 sensors should maintain 45 +/- 0.1 degrees.

5. Data is only available from the TAS-1000 when data dependencies are satisfied. Refer to 5.4: TAS-1000 Data Sources to determine availability of data types. Note that some data types are highly dependent on other data. For example, wind calculations require True Airspeed, Heading, Groundspeed and Track and so are not available unless all four data types are available which cannot occur until the aircraft is in-flight.

6. No field repairs are allowed on the TAS-1000 system or components. Any malfunctioning TAS-1000 system or components must be removed from the aircraft and returned to Insight Instrument Corporation for repair. Removal can be accomplished by reversing the instructions for TAS-1000 component installation. The TAS-1000 wiring and connectors may remain in the aircraft while components are removed for service. Pitot tubes must be securely plugged while the p/n 1000-001 display is disconnected, and a pitot/static leak test performed on the aircraft before flight.
5.4: TAS-1000 Data Sources

<table>
<thead>
<tr>
<th>Data Source 1</th>
<th>Data Source 2</th>
<th>Data Source 3</th>
<th>Data Source 4</th>
<th>Data Source 5</th>
<th>Data Source 6</th>
<th>Data Source 7</th>
<th>Data Source 8</th>
<th>Data Source 9</th>
<th>Data Source 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>BASIC ALTITUDE</td>
<td>LATITUDE/LONGITUDE</td>
<td>GPS</td>
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<td>Pressure Altitude</td>
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**Units:** Miles, Nautical Miles, Feet, Kilometers, KPH, Knots, MMSI, Hertz, Volts, Amps, Ohms, Percent, Degrees, Minutes, Seconds, Hours, Days, Months, Years, Bars, Atmospheres, Pascals, SI Units, Standard Units, Custom Units, User-Defined Units.
# TAS 1000 MODIFICATION DRAWING LIST #1000-403

**Rev H**

<table>
<thead>
<tr>
<th>Drawing Number</th>
<th>Rev.</th>
<th>Drawing Title</th>
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<tbody>
<tr>
<td>1000-001</td>
<td>D</td>
<td>TAS 1000 AIR DATA COMPUTER</td>
</tr>
<tr>
<td>1000-002</td>
<td>C</td>
<td>WINDICATOR</td>
</tr>
<tr>
<td>1000-301</td>
<td>J</td>
<td>TAS 1000 INSTALLATION SCHEMATIC Pages 1-4</td>
</tr>
<tr>
<td>1000-302</td>
<td>-</td>
<td>OAT MOUNTING DIAGRAM</td>
</tr>
<tr>
<td>1000-303</td>
<td>D</td>
<td>FUEL FLOW / TF500 SENSOR MOUNTING DIAGRAM 1-3</td>
</tr>
<tr>
<td>1000-304</td>
<td>-</td>
<td>TAS 1000 PANEL CUT-OUT</td>
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<tr>
<td>1000-305</td>
<td>B</td>
<td>WINDICATOR MOUNTING DIAGRAM Pages 1-3</td>
</tr>
<tr>
<td>1000-816</td>
<td>A</td>
<td>TF500 SENSOR INSTALLATION SCHEMATIC</td>
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The TAS installation must be performed in accordance with Advisory Circular 43.13-1 B Acceptable Methods, Techniques, and Practices - Aircraft Inspection and Repair.
TAS 1000
INSTALLATION PROCEDURES

INSIGHT INSTRUMENT CORPORATION
BOX 122, FORT ERIE, ONTARIO L2A 5M6

NOTES:
1. P/N 1000-503 WINDICATOR NAMEPLATE.
2. All dimensions in inches, tolerance +/- 0.010 U.S.

1000-002-A
(FRONT MOUNT)

1000-002-B
(REAR MOUNT)
NOTES:
1. ALL GPS AND TAS 1000 REQUIRE SOFTWARE COMMUNICATION CONFIGURATION.
2. FOR SINGLE BATTERY AIRCRAFT NO CONNECTION TO PIN 22 MOD C ONLY.
3. ALL WIRING 24 AWG UNLESS OTHERWISE SPECIFIED.
4. INSTALL JUMPERS INSIDE DSUB-25 PLUG CONNECTOR SHELL.
5. OPEN DRAIN OUTPUT (EQUIV. SWITCH TO GROUND), DO NOT EXCEED 30VDC, 0.5A.
6. TO INTERFACE TO EXISTING SONALERT ADD DIODES, SONALERT MUST BE SWITCHED TO COMMON GND.
7. WIRING FOR TAS1000 MOD "D".
8. INSIGHT SUPPLIED WINDICATOR CABLE.
1. Wiring for TAS 1000 family "C".
2. Pin "C" on Altimeter must be connected to shield ground.
**FUEL FLOW SENSOR CONNECTIONS**

(TWIN ENGINE INSTALLATION SHOWN)

(SEE NOTE 1 FOR SINGLE ENGINE INSTALLATION)

**OPTION A**

- **FFA 21**
- **FFB 8**
- **FFA 6**
- **FFB 7**
- **N/A**

**OPTION B**

- **FFA 21**
- **FFB 8**
- **FFA 6**
- **FFB 7**
- **N/A**

**OPTION C**

- **FFA 21**
- **FFB 8**
- **FFA 6**
- **FFB 7**
- **N/A**

**OPTION D**

- **FFA 21**
- **FFB 8**
- **FFA 6**
- **FFB 7**
- **N/A**

**OPTION E**

- **FFA 21**
- **FFB 8**
- **FFA 6**
- **FFB 7**
- **N/A**

**OPTION F**

- **FFA 21**
- **FFB 8**
- **FFA 6**
- **FFB 7**
- **N/A**

**NO FUEL FLOW SENSORS INSTALLED**

- **FFA 21**
- **FFB 8**
- **FFA 6**
- **FFB 7**
- **N/A**

**SEE PAGE ONE FOR REVISION LOG**

**NOTES:**

1. SINGLE ENGINE AIRCRAFT USE FF1 INPUTS, TERMINATE FF2A AND FF2B AS IN OPTION F.
2. ALL WIRING 24 AWG U.O.S., INSTALL JUMPERS INSIDE DSUB-25 CONNECTOR SHELL.
3. ALL FUEL FLOW INPUTS (PINS 6, 7, 8, 21) MUST BE TERMINATED.
4. TERMINATE FLOSCAN 2018 RED WIRE TO FUSED 12VDC, BLACK WIRE TO AIRFRAME GROUND.
   (ALL FLOSCAN 2018 SENSORS REQUIRE 10K PULL-UP FROM WHITE WIRE TO 12VDC)
5. WIRING FOR TAS1000 MOD D.
6. FOR INSIGHT FUEL FLOW SENSORS, THE BRACKET MUST BE CONNECTED TO AIRFRAME GROUND.
TAS EXPANSION MODULE CONNECTIONS

TAS 1000 DISPLAY (PART NO. 1000-001) (DSUB-25 SOCKET)

EXPANSION OUTPUT HI (2)
SIGNAL GROUND (11)
(22)

TAS EXPANSION (P/N 1000-003) (DSUB-15 SOCKET) (DSUB-15 PLUG) (H1)

10 INPUT HI
9 INPUT LO

OPTION 1

NOTE 8

(DSUB-15 SOCKET CONT)

_DIRS 8, 12, 7, 6, 5, 4, 3, 2, 15, 14, 13, 12, 11

(DSUB-15 SOCKET CONT)

TRANSPODER (OR OTHER GRAY-CODE RECEIVER)

(SEE NOTE 7) (SEE INSTALLATION PROCEDURES)

6 OVERSPEED WARNING

OVERSPEED WARNING DEVICE

SEE NOTE 6.

NOTES:
1. NO CONNECTION TO TAS 1000 PIN 2 IF TAS EXPANSION IS NOT INSTALLED.
2. NO CONNECTION TO TAS EXPANSION PIN 2.
3. ALL WIRING 24 AWG UNLESS OTHERWISE SPECIFIED.
4. INSTALL JUMPERS INSIDE DSUB-15 CONNECTOR SHELL.
5. ISOLATION DIODES ARE RECOMMENDED FOR ALL GRAY-CODE RECEIVING DEVICES.
   SOME BUT NOT ALL GRAY-CODE RECEIVERS CONTAIN INTERNAL ISOLATION DIODES.
   FOR GRAY-CODE RECEIVERS WITHOUT INTERNAL ISOLATION DIODES, INSERT A 1N4007
   OR EQUIVALENT IN SERIES WITH EACH LINE (ANODE TO RECEIVER).
6. CONNECT TO OVERSPEED WARNING OUTPUT ONLY IF PART NO. 1000-003 MATCHES AIRCRAFT TYPE AND CONFIGURATION.
   OVERSPEED WARNING OUTPUT IS NORMALLY OPEN (HI-2) AND SWITCHES TO GROUND DURING OVERSPEED CONDITION.
   OVERSPEED WARNING OUTPUT RATED 28VDC 0.25 AMPS MAXIMUM. (SEE INSTALLATION MANUAL)
7. INSTALLER PROVIDED CONNECTORS
8. EXPANSION MODULE 1000-004 MOD.8
## INSTALLATION PROCEDURES

### DOCUMENT 1000-402  REV. H

**Dimensions shown for panel cut out**

- **3.190**
- **2.619**
- **1.217**
- **0.646**
- **0.158 RAD X8**

**Dimensions shown for hole center locations**

- **3.220**
- **1.040**
- **0.140 DIA TYP. X4**

### Notes:

1. Cutout dimensions shown for .010 clearance fit.
2. All dimensions shown are symmetrical around the center point.
3. Not to scale, do not use as a template.

---

**TAS 1000 PANEL CUT-OUT DIAGRAM**

Insight Instrument Corporation
Box 122, Fort Erie, Ontario L2A 5M6

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NOTES:

1. SENSOR CABLE ASSEMBLY IS PRE-TERMINATED BUT LENGTH MAY BE MODIFIED BY INSTALLER.

2. LOCATION OF OAT PROBE IS CRITICAL TO CORRECT OPERATION, INSTALL ACCORDING TO INSTALLATION PROCEDURES 1000–402.
NOTES:

1. Install INSIGHT FLOW SENSOR, one per engine.
2. Use ONLY approved 1/4 NPT fittings for transducer inlet and outlet, installer supplied.
3. Use ONLY approved fuel line assemblies.
4. Use approved thread sealant. Torque pipe threads to a max of 15 ft. lbs. (180 in. lbs.)
5. INSIGHT supplied electrical harness; 1/3 TURN, 3-pin OR dip-on 7-pin for FLOW/VIBRATION SENSOR.
6. A straight length of fuel line upstream from the sensor inlet will improve accuracy by reducing turbulence in the rotor.
7. CONFIRM TRANSDUCER CAGE IS GROUNDED TO AIRFRAME GROUND BEFORE POWERING UP.
8. Mount transducer with nomenclature facing up.
9. Confirm all wiring PRIOR to powering up.
10. SEE INSTALLATION SCHEMATIC 1000-301 FOR FLOW SENSOR WIRING DETAILS.
11. SEE INSTALLATION SCHEMATIC 1000-816 FOR TRUE FLOW SENSOR WIRING DETAILS.
12. SPECIFY GPS MANUFACTURER AND MODEL WHEN ORDERING TRUE FLOW SENSOR, EXCEPT HINGE B-FORMAT, APOLLO AND CARMANZ Z-FORMAT.
13. FLOW SENSOR 30,000 PULSES PER GALLON UNLESS INDICATED BY HINGE.
14. FLOW SENSOR DATA SIGNAL 6V UNLESS EPR, EXTERNAL FULL-UP SENSOR REQUIRED, SEE WIRING DIAGRAM.
15. Install vibration sensor, one per engine, consult Insight for alternate application.

**PART NUMBERS**

<table>
<thead>
<tr>
<th>INJECTOR</th>
<th>CARBURETOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>FLOW SENSOR</td>
<td>1000-0044-1-(-Knnnnn)-(E11)</td>
</tr>
<tr>
<td>TRUE FLOW SENSOR</td>
<td>1000-006-1X SEE NOTE 12.</td>
</tr>
<tr>
<td>FLOW/VIBRATION SENSOR</td>
<td>1000-004A-4X SEE NOTE 12.</td>
</tr>
<tr>
<td>VIBRATION SENSOR</td>
<td>1000-004V(-Xn) SEE NOTE 15.</td>
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</table>

**FLOW INLET HIGHER THAN OUTLET**

**3-PIN CONNECTOR PINOUT**

<table>
<thead>
<tr>
<th>PIN</th>
<th>FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>AIRCRAFT GROUND</td>
</tr>
<tr>
<td>2</td>
<td>DATA OUT (TRANSMIT)</td>
</tr>
<tr>
<td>3</td>
<td>10 TO 30 VDC INPUT</td>
</tr>
</tbody>
</table>

**7-PIN CONNECTOR PINOUT**

<table>
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<th>PIN</th>
<th>FUNCTION</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>10 TO 30 VDC INPUT</td>
</tr>
<tr>
<td>2</td>
<td>DATA OUT (TRANSMIT)</td>
</tr>
<tr>
<td>3</td>
<td>AIRCRAFT GROUND</td>
</tr>
<tr>
<td>4</td>
<td>RESERVED</td>
</tr>
<tr>
<td>5</td>
<td>C2 CLOCK</td>
</tr>
<tr>
<td>7</td>
<td>DATA IN (RECEIVE)</td>
</tr>
</tbody>
</table>
NOTES:
1. Install INSIGHT FLOW SENSOR, one per engine.
2. Use ONLY approved 1/4 NPT fittings for transducer inlet and outlet, installer supplied.
3. Use ONLY approved fuel line assemblies.
4. Use approved thread sealant. Torque pipe threads to a max of 15 ft. lbs. (80 in. lbs.)
5. INSIGHT supplied electrical harness; 1/3 TURN, 3-pin OR dip-on 7-pin for FLOW/VIBRATION SENSORS.
6. A straight length of fuel line upstream from the sensor inlet will improve accuracy by reducing turbulence in the rotor.
7. CONFIRM TRANSDUCER CASE IS GROUNDED TO AIRFRAME GROUND BEFORE POWERING UP.
8. Mount transducer with nomenclature facing up.
9. Confirm all wiring PRIOR to powering up.
10. SEE INSTALLATION SCHEMATIC 1000-301 FOR FLOW SENSOR WIRING DETAILS.
11. SEE INSTALLATION SCHEMATIC 1000-876 FOR TRUE FLOW SENSOR WIRING DETAILS.
12. SPECIFY GPS MANUFACTURE AND MODEL WHEN ORDERING TRUE FLOW SENSOR, SEND ZIP, HINGE 8-FORMAT, APOLLO AND GAVIN 2-FORMAT.
13. FLOW SENSOR 30,000 GALLON UNITS. IDENTIFIED BY K-factor.
14. FLOW SENSOR DATA SIGNALS UNLESS -EPR, EXTERNAL FILL-UP SENSORS REQUIRED, SEE WIRING DIAGRAM.
15. Install vibration sensor, one per engine, consult Insight for alternate application.
**TAS 1000 INSTALLATION PROCEDURES**

**DOCUMENT 1000-402 REV. H**

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**PART NUMBERS**

<table>
<thead>
<tr>
<th>INJECTOR</th>
<th>CARBURETOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>FLOW SENSOR</td>
<td>1000-004-3(-Knurled)(-EP)</td>
</tr>
<tr>
<td>TRUE FLOW SENSOR</td>
<td>1000-006-3X SEE NOTE 12</td>
</tr>
</tbody>
</table>

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**NOTES:**

1. Install INSIGHT FLOW SENSOR, one per engine.
2. Use ONLY approved 1/4 NPT fittings for transducer inlet and outlet, installer supplied.
3. Use ONLY approved fuel line assemblies.
4. Use approved thread sealant. Torque pipe threads to a max of 15 ft. lbs. (180 in. lbs.)
5. INSIGHT supplied 1/3 turn bayonet electrical harness P/N CAR-1000-809.
6. A straight length of fuel line upstream from the sensor inlet will improve accuracy by reducing turbulence in the rotor.
7. CONFIRM TRANSDUCER CASE IS GROUNDED TO AIRFRAME GROUND BEFORE POWERING UP.
8. Mount transducer with recomendation facing up.
9. Confirm all wiring PRIOR to powering up.
10. SEE INSTALLATION SCHEMATIC 1000-301 FOR FLOW SENSOR WIRING DETAILS.
11. SEE INSTALLATION SCHEMATIC 1000-816 FOR TRUE FLOW SENSOR WIRING DETAILS.
12. SPECIFY OPS MANUFACTURE AND MODEL WHEN ORDERING TRUE FLOW SENSOR, BENDIX KING U-FORMAT, APOLLO AND CARAVAN U-FORMAT.
13. FLOW SENSOR 30,000 PULSES PER GALLON UNLESS INDICATED BY -EP.
14. FLOW SENSOR DATA SIGNAL 5V UNLESS -EP. EXTERNAL PULL-UP RESISTOR REQUIRED, SEE WIRING DIAGRAM.
15. Transducer self supporting on fuel fittings.

---

**FLOW SENSOR AND TRUE FLOW SENSOR MOUNTING DIAGRAM (BRACKET TYPE 3)**

**Insight Instrument Corporation**

Box 122, Fort Erie, Ontario L2A 5M6

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**TIN FUNCTION**

<table>
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<tbody>
<tr>
<td>1</td>
<td>AVIONICS GROUND</td>
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<tr>
<td>2</td>
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<tr>
<td>3</td>
<td>5V TO 30 VDC INPUT</td>
</tr>
</tbody>
</table>
NOTES:

1. Install INSIGHT FLOW SENSOR, one per engine.
2. Use ONLY approved 1/4 NPT fittings for transducer inlet and outlet, installer supplied.
3. Use appropriate fittings to match airplane fuel lines.
4. INSIGHT supplied 1/3 turn bayonet mount power and signal harness P/N CA3-1000-809
5. A straight length of fuel line upstream from the sensor inlet will improve accuracy by reducing turbulence in the rotor.
6. Mount on firewall or airframe with nomenclature facing up.
7. Installer may drill additional holes in bracket if necessary.
8. CONFIRM TRANSDUCER CASE IS GROUNDED TO AIRFRAME GROUND BEFORE POWERING UP
9. Confirm all wiring PRIOR to powering up
10. SEE INSTALLATION SCHEMATIC 1000-301 FOR FLOW SENSOR WIRING DETAILS.
11. SEE INSTALLATION SCHEMATIC 1000-816 FOR TRUE FLOW SENSOR WIRING DETAILS.
12. SPECIFY GPS MODEL WHEN ORDERING TRUE FLOW SENSOR, B = BENDIX KING, Z = APOLLO AND GARMIN.
13. FLOW SENSOR 30,000 PULSES PER GALLON UNLESS INDICATED BY -K, -NN.
14. FLOW SENSOR DATA SIGNAL 5V UNLESS -EPR, EXTERNAL PULL-UP RESISTOR REQUIRED, SEE WIRING DIAGRAM.
NOTES:

1. Install INSIGHT FLOW SENSOR, one per engine.
2. Use ONLY approved 1/4 NPT fittings for transducer inlet and outlet, installer supplied.
3. Use appropriate fittings to match airplane fuel lines.
4. INSIGHT supplied 1/3 turn bayonet mount power and signal harness P/N CAB=1000=809
5. A straight length of fuel line upstream from the sensor inlet will improve accuracy by reducing turbulence in the rotor.
6. Mount on firewall or airframe with nomenclature facing up.
7. Installer may drill additional holes in bracket if necessary.
8. CONFIRM TRANSDUCER CASE IS GROUNDED TO AIRFRAME GROUND BEFORE POWERING UP
9. Confirm all wiring PRIOR to powering up
10. SEE INSTALLATION SCHEMATIC 1000-301 FOR FLOW SENSOR WIRING DETAILS.
11. SEE INSTALLATION SCHEMATIC 1000-816 FOR TRUE FLOW SENSOR WIRING DETAILS.
12. SPECIFY GPS MODEL WHEN ORDERING TRUE FLOW SENSOR, B = BENIOX KING, Z = APPOLLO AND GARMIN.
13. FLOW SENSOR 30,000 PULSES PER GALLON UNLESS INDICATED BY -Krpm.
14. FLOW SENSOR DATA SIGNAL 5V UNLESS -EPR, EXTERNAL PULL-UP RESISTOR REQUIRED, SEE Wiring Diagram.

FLOW SENSOR AND TRUE FLOW SENSOR MOUNTING DIAGRAM (BRACKET TYPE 2)
INSTALLATION

1. LOCATE WINDICATOR ON PANEL.
2. USE 1.375 ROUND PANEL PUNCH. INSIGHT P/N MCF-730BB-1-38.
3. CONNECT WINDICATOR CABLE TO WINDICATOR. CONNECTOR HAS A SNAPPING ACTION.
4. USING CIRCUMFERENCE OF WINDICATOR, PRESS FIRMLY INTO PANEL.
5. APPLY RTV TO BACK OF WINDICATOR, SUGGEST 1 DROP 4 PLACES.
6. HOLD IN PLACE UNTIL RTV IS CURED.
7. SEE INSTALLATION SCHEMATIC 1000-301 FOR TERMINATION DETAIL.

NOTES

1. FOR MOUNTING FRONT MOUNT WINDICATOR ONLY, P/N 1000-002-B
2. USE WINDICATOR CABLE P/N CAB-1000-507-06.
3. WHEN ORDERING THE WINDICATOR, MOUNTING MUST BE SPECIFIED.
INSTALLATION

1. LOCATE WINDICATOR ON PANEL.
2. USE 1.375 ROUND PANEL PUNCH, INSIGHT P/N MCF-730BB-1-38
3. PASS WINDICATOR CABLE FROM BEHIND PANEL THROUGH CUTOFF.
4. CONNECT WINDICATOR CABLE TO WINDICATOR, CONNECTOR HAS A SNAPPING ACTION.
5. USING CIRCUMFERENCE OF WINDICATOR, PRESS FIRMLY INTO PANEL.
6. APPLY RTV TO BACK OF WINDICATOR, SUGGEST 1 DROP 4 PLACES.
7. HOLD IN PLACE UNTIL RTV IS CURED.
8. SEE INSTALLATION SCHEMATIC 1000-301 FOR TERMINATION DETAIL.

NOTES

1. FOR MOUNTING FRONT MOUNT WINDICATOR ONLY, P/N 1000-002-A
2. WINDICATOR CABLE P/N CAB-1000-507-06.
3. WHEN ORDERING THE WINDICATOR, MOUNTING MUST BE SPECIFIED.
**NOTES:**

1. Garmin 430 and 530 require software communication configuration.
2. Apollo CX50/60/65 require software communication configuration.
3. Cable P/N 1000-209-10 for 10" and P/N 1000-209-24 for 24".
4. Powering P7500 from the same breaker as the GPS is preferred.
5. Apollo software version shall be 3.3 or higher.
6. GPS connector symbol name and pin numbers for information only.
7. Installer must verify GPS wiring is in accordance with GPS manual(s).
8. For Insight true flow sensors, the bracket must be connected to aircraft ground.
9. Specify GPS manufacturer and model when ordering Insight true flow sensor.