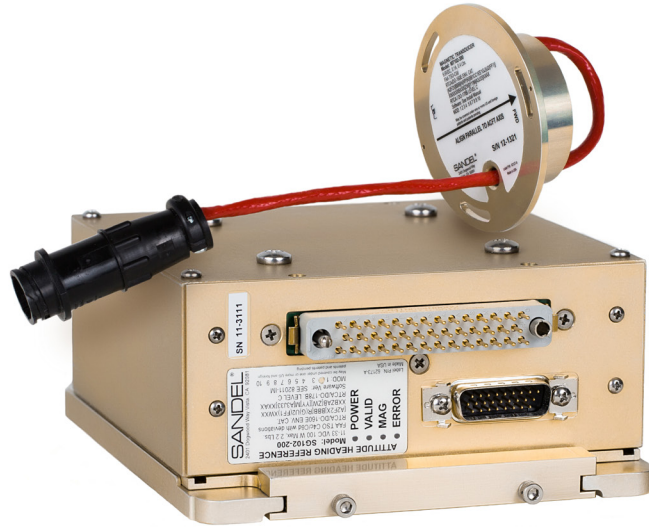


SG102 AHRS



The Sandel SG102 (MOD2) Attitude Heading Reference System (AHRS) has an initialization time that is 3Xs faster than the previous version. It also now comes with selectable low- and high-speed ARINC 429 outputs, which allows for additional interface options with radar systems, satellite communicator antennas and other avionics.

It is an affordable, solid-state replacement for older directional gyros in your piston, turboprop, jet aircraft, or helicopter. With an MTBF of more than 10,000 hours, the SG102 (MOD2) is the most practical way to dramatically increase the reliability of your aircraft's compass system.

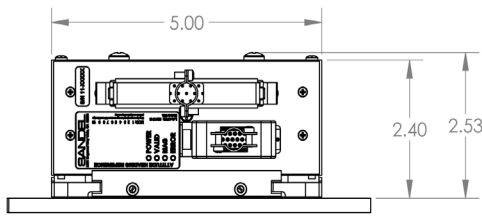
See what's next

SANDEL.

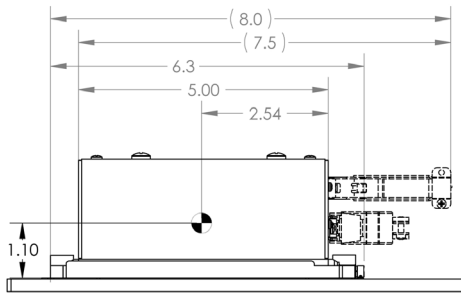
SG102 AHRS

(MOD2)

- Certified for primary heading reference and secondary attitude
- Solid state, plug-compatible upgrade for the Bendix/King KG102A directional gyro
- Compatible with all common directional gyro interfaces
- Pitch and roll output for auxiliary applications requiring stabilization



FRONT VIEW



SIDE VIEW

Weight

SG102-000/100/200 2.4 lbs (1.08 kg) including connectors

MT102 Magnetic Transducer 0.4 lbs (0.18 kg)

SG102 Mounting Base 0.6 lbs (0.27 kg)

Dimensions

SG102-000/100/200 5.0 in x 6.3 in x 2.53 in (12.7 cm x 15.9 cm x 6.1 cm)

MT102 Magnetic Transducer 3.4 in diameter, 1.0 in height (8.6 cm x 2.4 cm)

SG102 Mounting Base 5.0 in x 6.1 in x 0.3 in (12.7 cm x 15.5 cm x .9 cm)

Power Requirements

11-33VDC, 30W maximum, 15W nominal

Inverter Output

26VAC, 400Hz, 5VA (no external inverter required)

Cooling Requirements

None

Operating Environment

Temperature -55° C to +70° C

Altitude +55,000 feet maximum

Performance

Initialization Time Approximately 1 minute nominal

Accuracy +/- 1 degree magnetic heading

Body Rate Limits +/- 250 %/sec

MTBF >10,000 hours, calculated

Certification Basis

SG102-000/100/200 TSO C4c, Bank and Pitch Instruments

TSO C6d, Direction Instrument, Magnetic (Gyroscopically Stabilized)

EASA ETSO, C4c, C64

RTCA/DO-178B, Software Level C

RTCA/DO-160E Env. Cat.

SG102-000: [A2F2X]BBB[S(LM)H(R)]XWXXXXBZAB[ZW][YY]

M[A3J33]XXAX

SG102-100: [A2F2X]BBB[H(R)R(BB1CC1)]XWXXXXBZAB[ZW][YY]

M[A3J33]XXAX

SG102-200: [A2F2X]BBB[R(G)U2(FF1)]XWXXXXBZAB[ZW][YY]

M[A3J33]XXAX

MT102 Magnetic Transducer

TSO C6d, Direction Instrument, Magnetic (Gyroscopically Stabilized)

EASA ETSO, C6d

RTCA/DO-160E Env. Cat.

[A2F2X]BBB[H(RP)R(BB1CC1EE1GJ)U2(FF1)]XWXXXXBXXX[ZW][YY]

M[A3J33]XXAX

RTCA/DO-178B, Software Level C

Interfaces

Magnetic Heading

ARINC 407 (XYZ Synchro), Stepper Motor (KG 102A),

ARINC 429 Low or High speed, RS-232

Pitch and Roll

ARINC 429 Low or High speed*

*Not certified for primary attitude. Pitch and roll data for auxiliary applications only, including reversionary attitude

Dimensions and specifications subject to change without notice.



SG102 AHRS

Pilot's Guide Effectivity and Errata

Insert this update ahead of the cover page of the Pilot's Guide referenced below.

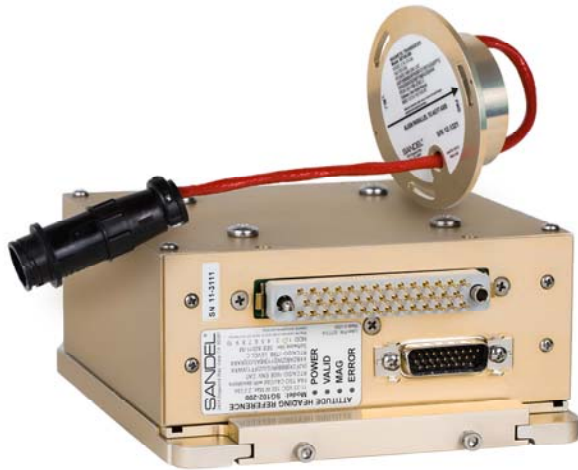
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Date:	30-SEP-2014
Effectivity:	Pilots Guide 82011-PG-E SG102 Software Version 1.35, 1.40 for SG102 (Mod 1) SG102 Software Version 1.52, 1.61 for SG102 (Mod 2) SG102 Software Version 1.52, 1.61 for SG102/D MT102 Software Version 1.00
Errata:	With the exception of the superseding information contained in this document, operation of the SG102 is as described in the SG102 Pilot's Guide referenced above.

SANDEL®

SG102

Attitude Heading Reference System



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Pilot's Guide

Revision E

Pilot information

Original Publication Date: 10 APR 2014

This guide provides information on the use and operation of the SG102 Attitude Heading Reference System.

Information in this guide is current as of publication or revision date. Specifications and operational details are subject to change without notice at the discretion of Sandel Avionics, Inc.

Copyright

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Revision notice

The “Effectivity, Errata, and Revision History” allow the use of this Pilot Guide with a specific software release. The “Effectivity, Errata, and Revision History” specifically lists the software to which this Pilot’s Guide applies and corrects any errors or omissions in this revision of the Pilot’s Guide. Document number 82011-PG-ERR, Effectivity, Errata, and Revision History” can be found on page VI of this Pilot’s Guide.

Operational and legal issues

The information provided by the SG102 is displayed by external equipment. It is the pilot’s responsibility to ensure the correct configuration and use of the external equipment. Always refer to your approved Aircraft Flight Manual Supplement for operation and limitations on the use of installed equipment.

Note: Because aircraft vary in their installed equipment, it is important to note that what is displayed by the information provided by the SG102 may vary depending on the presence or absence of equipment.

Approvals

The FAA has approved the SG102 under the following TSOs:

TSO-C4c Bank and Pitch Instruments
TSO -C6d Direction Instrument, Magnetic (Gyroscopically Stabilized)

The following RTCA Standards apply to this product:

DO-160E: Environmental (See Installation Manual)
DO-178B Software Level C

Installation of the SG102 Attitude Heading Reference System in a type-certificated aircraft must be performed in accordance with the Sandel SG102/MT102 Installation Manual, document number 82011-IM (latest revision).

Conventions Used in This Manual

This manual uses terms, which should be familiar to aviation-minded readers, such as “magnetic heading” and “gyro”. Terms, which are specific to the SG102, will be placed in the glossary.

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Effectivity, Errata and Revision History

Applies to: SG102/D
SG102 (Mod 1 & Mod 2)
MT102

With the exception of the superseding information contained in this section, operation of the SG102 is as described in the SG102 Pilot's Guide referenced above.

Revision	Date	Comments
E	10-APR-2014	Effectivity, Errata and Revision History updated. Previous Errata incorporated. Page 1-1: SG102/D and SG102 Mod 2 information added. Page 2-1: Initialization information updated. Page 2-2: Power Interruptions description updated. Page 3-1: Operational Specifications removed. Page 4-1: Line for Mod level added.
D4	16-FEB-2011	Updated for software release 1.31
D3	03-NOV-2009	Updated for software release 1.30
D2	22-MAY-2009	Updated for software release 1.26
D1	07-MAY-2009	Updated for software release 1.25
D	11-FEB-2009	Updated copyright. Errata removed. Updated limitations.
C	06-NOV-2008	Page 2-1 Preflight Initialization period; Errata updated.
B	31-OCT-2008	Page vi: Updated for software release 1.10 and SG102 Mod 1; Errata updated.
A	18-DEC-2008	Initial Release

Errata

None

CHAPTER 1 WELCOME TO THE SG102

What is the SG102?

The Sandel model SG102 is a solid-state Attitude Heading Reference System (AHRS) that combines angular rate, linear acceleration and magnetic field measurements to provide primary heading information.

Roll and pitch information is provided for stabilization of other equipment such as weather RADAR or FLIR cameras etc.

Limitations

1. For SG102/D, and SG102 (Mod 1 and Mod 2): The roll and pitch information provided by the SG102 may not be used to display primary aircraft attitude to the aircrew. The roll and pitch information may be used to display reversionary or backup attitude information to the flight crew in the primary field of view.
2. For SG102 Mod 0: The roll and pitch information provided by the SG102 may not be used to display aircraft attitude to the aircrew.
3. The SG102 is not approved for aerobatic flight.
4. The SG102 may not provide satisfactory heading performance above 70° north latitude or below 70° south latitude.

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CHAPTER 2 OPERATION

NORMAL OPERATION

Flying an aircraft equipped with an SG102 does not require any special piloting skills; however there are a few key points for the pilot:

Preflight:

- Refer to the Approved Flight Manual Supplement for the SG102.
- Initialization periods (at 15°C):
 - Mod 0 (S/Ns below 11-2500 - Units shipped prior to 11/28/2008): 4-5 minutes.
 - Mod 1 (S/Ns 11-2500 to 11-3045): less than 3 minutes.
 - Mod 2 (S/Ns 11-3100 and above): approximately 1 Minute
 - SG102/D: approximately 1 Minute

During the initialization period the aircraft should not be moved. When the Flag is removed from the heading display, the SG102 initialization is complete.

In Flight:

- The SG102 supports two slaving modes: “Slaving ON” and “Slaving OFF”. The “Slaving OFF” mode requires the installation of Pilot-operated slaving switches.
- Under normal conditions the SG102 should be operated with “Slaving ON”, by moving the Slaving selector switch to the “ON” position.
- To operate in the “Slaving OFF” mode, move the Slaving selector switch to the “OFF” position. The heading display can now be adjusted with the CW or CCW manual slew switches as desired. All displays driven by the SG102 will track the adjusted heading.
- Move the Slaving On switch to the ON position to restore slaving operation. All indicators will immediately slew to the current magnetic heading.

ABNORMAL OPERATION

Outputs Flagged

If the SG102 is inoperative or detects an internal error, all outputs will be flagged. Reference to an alternate heading source must be made.

Power Interruptions

The SG102 can withstand power interruptions of up to 30 seconds in flight without losing its initialization. If longer power interruptions are experienced and the gyro flag appears, it will be necessary to use an alternate means of primary heading information for the remainder of the flight.

CHAPTER 3 TECHNICAL SPECIFICATIONS

TSO Compliance	
Technical Standard Order (TSO):	TSO-C4c “Bank and Pitch Instruments” TSO-C6d “Direction Instrument, Magnetic (Gyroscopically Stabilized)”
Software Certification:	RTCA/DO-178, Level C
Environmental Category:	RTCA DO-160E

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CHAPTER 4 INSTALLATION INFORMATION

To be completed by installer.

Date of Installation: _____

Installer Company: _____

Installer Address:

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Installer Phone: _____

Work Order #: _____

Installer: _____

Notes: _____

Mod level:

CHAPTER 5 GLOSSARY

Magnetometer	A device that measures the earth's magnetic field
Failure	The inability of the equipment or any sub-part of that equipment to perform within specified limits.

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CHAPTER 6 AVIONICS ACRONYMS

AFM	Airplane Flight Manual
AFMS	Airplane Flight Manual Supplement
AHRS	Attitude Heading Reference System
FAA	Federal Aviation Administration
HDG	Magnetic Heading
POH	Pilot's Operating Handbook
RTCA	Radio Technical Commission on Aeronautics (rtca.org)
TSO	Technical Standard Order

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