



AEROSPACE STANDARD	AS6165™	REV. A
	Issued	2012-12
	Stabilized	2019-05
Superseding AS6165		
Interface Standard, Airborne EO/IR Systems, Maintenance and Test		

RATIONALE

The Technical Committee determines that the using community is moving towards newer technology and would like to alert users that this newer technology exists which may want to be considered for new design.

STABILIZED NOTICE

This document has been declared "Stabilized" by the SAE AS-1C Avionic Subsystems Committee and will no longer be subjected to periodic reviews for currency. Users are responsible for verifying references and continued suitability of technical requirements. Newer technology may exist.

SAE Technical Standards Board Rules provide that: "This report is published by SAE to advance the state of technical and engineering sciences. The use of this report is entirely voluntary, and its applicability and suitability for any particular use, including any patent infringement arising therefrom, is the sole responsibility of the user."

SAE reviews each technical report at least every five years at which time it may be revised, reaffirmed, stabilized, or cancelled. SAE invites your written comments and suggestions.

Copyright © 2019 SAE International

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of SAE.

TO PLACE A DOCUMENT ORDER: Tel: 877-606-7323 (inside USA and Canada)
Tel: +1 724-776-4970 (outside USA)
Fax: 724-776-0790
Email: CustomerService@sae.org
<http://www.sae.org>

SAE WEB ADDRESS:

Full document details: SAE AS6165A

SAE values your input. To provide feedback on this Technical Report, please visit <http://standards.sae.org/AS6165A>

FOREWORD

AS6165 is a standard that utilizes the electrical and data interfaces defined by AS6129 and AS6135. In particular, it defines the communication protocols and parameters and other data that would be required to support maintenance and test of an EO/IR system especially when installed on an aircraft or other platform.

This document was prepared by the AS-1C2, EO/IR Sensor System Maintenance and Test Interface Task Group, under the jurisdiction of the AS-1C Subcommittee, Avionic Subsystems, of the AS-1 Committee, Platform Systems and System Integration.

TABLE OF CONTENTS

1.	SCOPE.....	3
1.1	Relationship Between Platform/Sensor Interfaces and SAE Standards	3
1.2	Purpose.....	4
1.3	Application.....	4
2.	REFERENCES.....	4
2.1	Applicable Documents	4
2.1.1	SAE Publications.....	4
2.1.2	NATO Publications.....	4
2.1.3	Industry Documents	5
2.2	Order of Precedence.....	5
2.3	Definitions	5
2.4	Acronyms	8
3.	GENERAL REQUIREMENTS	8
3.1	Power	9
3.2	Command, Status, and Response	9
3.2.1	Maintenance Mode Control.....	11
3.3	Safety Discretes	11
3.4	Upload Software Updates and Sensor Configuration/Calibration Data.....	11
3.5	Diagnostics and Prognostics.....	11
3.6	Imagery	11
4.	DETAILED REQUIREMENTS	12
4.1	Power	12
4.2	Command, Status, and Response Messages (CSRM)	12
4.2.1	Maintenance Mode	12
4.2.2	Safety	13
4.3	Geospatial Position Data	13
4.4	Time Stamping and Time Synchronization	13
4.5	Hand Controller	13
4.6	Uploading Software Updates	13
4.7	Diagnostics and Prognostics.....	14
4.7.1	Diagnostic State Variables.....	14
4.7.2	File Download	15
4.8	Imagery	15
5.	NOTES.....	15
FIGURE 1	RELATED SAE STANDARDS	3
FIGURE 2	M&T DATA FLOW.....	9
FIGURE 3	MAINTENANCE AND TEST INTERFACES.....	10
FIGURE 4	ALTERNATIVE M&T CONNECTION TO EO/IR SYSTEM.....	10
TABLE 1	ACRONYMS	8
TABLE 2	EXAMPLE DIAGNOSTIC STATE VARIABLES.....	14

1. SCOPE

This standard defines the use of data interfaces between a host platform and an electro-optic/infrared (EO/IR) system for maintenance and test (M&T) purposes. In particular, this standard defines the use of the data interfaces in order to facilitate the:

- a. confirmation of system performance and function;
- b. external initiation of built-in-test (BIT) functions;
- c. performance of other diagnostic tests of system health;
- d. downloading M&T data;
- e. uploading software changes.

This standard does not cover mechanical or electrical interfaces, nor does it define the basic platform-to-sensor communication protocols and formats. Furthermore, this standard does not address software changes that are made by the manufacturer and not accessible at the sensor interfaces. Data protocols and formats are covered by AS6135. Electrical interfaces are covered by AS6129. This standard covers the use of the interfaces defined by AS6129 and AS6135 for the purposes described herein.

1.1 Relationship Between Platform/Sensor Interfaces and SAE Standards

Figure 1 shows the relationship between the interfaces and the various SAE standards. Standard AS6129 (Electrical) covers Power, Connectors, and Communications (transport, the physical layer). Standard AS6135 (Data), covers both the Communications and the various data (e.g., imagery, meta-data, Command and Status). AS6135 overlaps AS6129 in the area of Communications, in particular protocols for data transport. AS6135 and AS6129 are closely bound together in that the data types, volumes, formats, and protocols defined in one standard force certain selections in the creation or update of the other. AS6165 (Maintenance and Test) overlaps both AS6129 and AS6135. A separate standard, AS6169, will cover the mechanical interface.

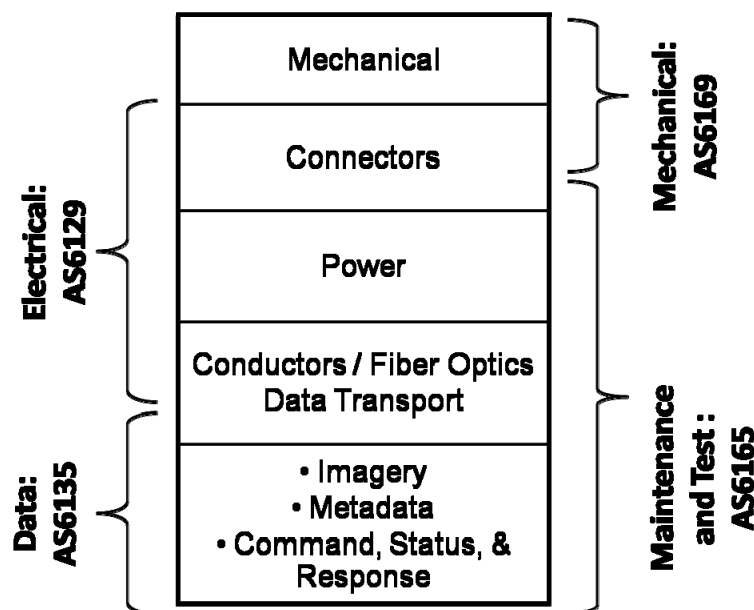


FIGURE 1 - RELATED SAE STANDARDS

1.2 Purpose

The intent of this standard is to enhance interchangeability and interoperability amongst equipment provided by various EO/IR system vendors and associated electronic systems with respect to M&T of the system during its development and employment. In so doing, this standard will reduce acquisition and life cycle costs associated with EO/IR system acquisition and integration and reduce the costs and proliferation of maintenance support equipment and associated software and training. Furthermore, it is envisioned that the ability to fully exercise the sensor system and download all relevant data while installed on the aircraft ("platform") will permit more robust assessment of system health without requiring deinstallation of the turret or associated electronics.

1.3 Application

This standard applies to platforms and EO/IR systems that interface with each other. Initial release of this document will address turreted EO/IR systems with future releases addressing other classes of EO/IR systems such as pods and warning sensors. This standard is applicable both to the development of new sensors and platforms as well as to upgrades to existing platforms or sensors.

2. REFERENCES

2.1 Applicable Documents

The documents listed in this section are cited in Sections 3 and 4 of this standard. This section does not include documents cited in other sections of this standard or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements documents cited in Sections 3 and 4 of this standard whether or not they are listed here. When specified herein, the specified revision level of a document shall be used. Otherwise, the latest revision level of the specified document is implied.

2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or 724-776-4970 (outside USA), www.sae.org.

AS6129 Interface Standard, Airborne EO/IR Systems, Electrical

AS6135 Interface Standard, Airborne EO/IR Systems, Data

AS6169 Interface Standard, Airborne EO/IR Systems, Mechanical

2.1.2 NATO Publications

Available from NATO Standardization Agency, North Atlantic Treaty Organization HQ, Boulevard Leopold III B-1110 Brussels, Belgium, Tel: +32.2.707.5556; <http://nsa.nato.int/nsa/>.

STANAG 4586 UAV Control Systems (USCS) Architecture

STANAG 4609 NATO Digital Motion Imagery Standard