DATA ITEM DESCRIPTION (DID)

Title: Interface Control Document (ICD) (MIL-STD-3046)

Number: DI-SESS-81876   **Approval Date:** 28 February 2013
AMSC Number: 9297   **Limitation:** N/A
DTIC Applicable: No   **GIDEP Applicable:** No
Office of Primary Responsibility: A/ARDEC (AR)
Applicable Forms: N/A

Use Relationships: The ICD records specific interface control drawings and documents authorized for preparation and use and the Interface Control Working Group (ICWG) authorized representatives.

This DID contains the format, content and preparation instructions for the data product resulting from the work task specified in the solicitation.

This DID is approved for use by the US Army to support the Army interim standard MIL-STD-3046, which will be canceled when a suitable non-government standard is developed or until two years from the date of the standard.   When MIL-STD-3046 is canceled, this DID will also be canceled.

Requirements:

1. <u>Reference documents.</u> The applicable issue of any documents cited herein, including their approval dates and dates of any applicable amendments, notices, and revisions, shall be as cited in the current issue of the DODISS at the time of the solicitation, or for non-DODISS listed documents as stated herein.

2. <u>Content.</u> The Interface Control Document (ICD) shall be in the contractor's format and shall include the content below.

    a. a listing of all released/approved interface information for the project

    b. a revision record for all released/approved interface information for the project, including release dates

    c. a cross-reference listing relating all released/approved interface information for the project to the configuration items and system elements to which they apply

    d. a description of the physical and functional relationships between all released/approved interface information for the project

    e. the links to the actual documentation defining the released/approved interface information for the project

3. <u>Recommended Format.</u> The format below is provided as a guide.

DI-SESS-81876

\<Project Name\>

INTERFACE CONTROL DOCUMENT (ICD) Template

PREPARED BY: _____   Date: _____

_____

<Name>

<Organization>

CONCURRED BY:

_____   Date: _____

_____

<Name>
<Organization>

_____   Date: _____

_____

<Name>
<Organization>

APPROVED BY:

_____   Date: _____

_____

<Name>
<Organization>

CHANGE RECORD

Change information should be entered for each document revision.

Date	Version	Description of change	Primary author

DI-SESS-81876

TABLE OF CONTENTS

1   Scope

1.1   Identification

This paragraph shall contain the approved identification number and title of the system to which this Interface Control Document (ICD) applies. It shall contain a full identification of the interfaces, the owners and the interfacing entities to which this document applies.

DI-SESS-81876

1.2   System Overview

This paragraph shall briefly state the purpose of the system and shall identify and describe the role, within the system, of the interfaces to which this ICD applies. The ICD created using this template will define one or more interfaces between two or more Configuration Items (CI's). An ICD can cover requirements for any number of interfaces to a system including both internal and external.

1.2.1   System Identification

Describe the full identification of the systems participating in the interface

1.3   Document Overview

This paragraph shall summarize the purpose and contents of this document and shall describe any security or privacy considerations associated with its use. Within this ICD, Section 1 covers the document identification, system overview, document overview, order of precedence, change authority, limitations and restrictions, and acronyms and glossary. Section 2 identifies the applicable documents. Section 3 identifies the specific interface definitions, physical characteristics and processing between [Product Name] and its Interfacing System or Interfacing Component. Section 4 contains Notes and Section 5 contains the Appendixes.

A section not relevant to a specific interface may be marked "Not Applicable (N/A)".

1.4   Order of Precedence

In the event of a conflict between the content of this ICD and the references cited herein, the requirements set forth in the ICD take precedence.   Nothing in this ICD, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

1.5   Change Authority

The approval authority for the ICD is the *<Project Name>* Configuration Control Board (CCB). Changes to this ICD must be coordinated with the *<Product Name>* IPT and both sides of the interface, and approved by the CCB.

2   Applicable Documents

This section shall list the number, title, revision, and date of all documents referenced in this specification. Document types included would be standards, Government documents, and other documents. This section shall also identify the source for all documents.

2.1 **Government Documents (Military/DoD standards, Interface documents and other publications)**

2.2 **Non-Government Documents (Industrial/commercial standards/specification and other publications)**

3 **Interface Specification Definition**

This section shall be divided into the following paragraphs and subparagraphs to specify the requirements for those interfaces to which this ICD applies.

3.1 **Interface Overview**

This paragraph shall identify an interface by name and project-unique identifier, and shall state its purpose/function as it is related to the interface. It shall summarize the system and emphasize on functionality including identification of key hardware and/or software components as they are related to the interface.

3.2 **Interface Descriptions**

This paragraph shall identify all the interfaces among the CI's and critical items to which this document applies. One or more interface diagrams, as appropriate, shall be provided to depict the interfaces in this document. Each interface shall be identified by name and project-unique identifier. The interface diagrams should show all interfaces internal and external to the system of interest (Interface Name and Project-Unique Identifier). This paragraph shall also describe what operations are performed on each of the systems involved in the interfaces and how the end users/operators will interact with the interface being defined, if applicable.

3.3 **Interface Definition**

Describe the complete released/approved interface definitions, the technical/physical characteristics and the media involved with the interfaces as applicable.

3.3.1 **Data**

This paragraph shall specify in a data element definition table similar to Table I, the following information, as applicable, for each data element transmitted across the interface as applicable:

• *A project-unique identifier for the data element*

• *A brief description of the data element*

• *The CI's and the critical item that is the source of the data element*

• *The CI(s), or critical item(s) that are the users of the data element*

• *The units of measure required for the data element, such as seconds, meters, kHz, etc.*

• *The limit/range of values required for the data element (for constants, provide the actual*

5

DI-SESS-81876

value)

- *The accuracy required for the data element*

- *The precision or resolution required for the data element in terms of significant digits.*

Table I: Example of an interface data element definition table

IDENTIFIER	DESCRIPTION	SOURCE CSCI	DESTINATION CSCI(s)	UNIT OF MEASURE	LIMIT/ RANGE	ACCURACY	PRECISION/ RESOLUTION
IFA001	VELOCITY	CSCI-A	CSCI-B CSCI-B	ft/sec	20-1000	+20	10^{-3}
IFA002	AZIMUTH	CSCI-A	CSCI-D	RADIANS	0 - $\square$/2	_0.5	10^{-3}
IFA003	ALTITUDE	CSCI-C	CSCI-A CSCI-B CSCI-D	ft	0-1500	+10	10^{-2}

3.3.2 Electrical

This paragraph shall describe any Electrical Interfaces between adjoining components, assemblies, etc. Typically an interconnect drawing or diagram (see figure 1 below) would be used in conjunction with descriptive text and a table to describe such an interface as applicable.
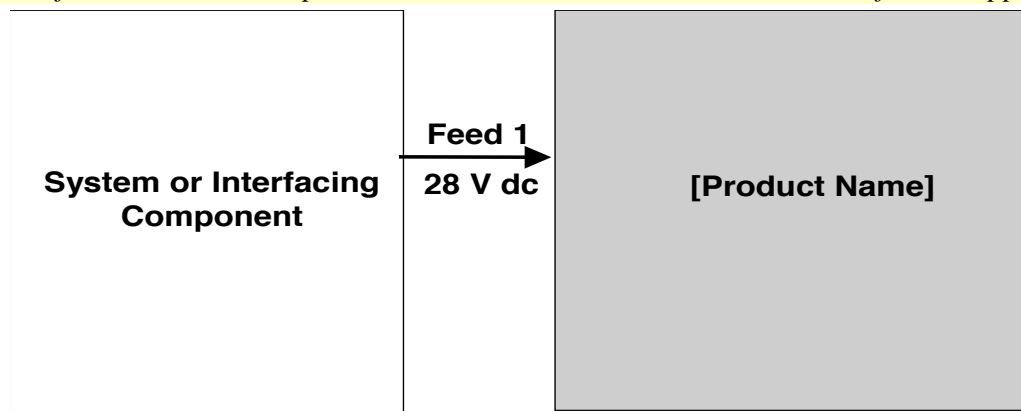
Figure 1: [System or Interfacing Component] to [Product Name] Electrical Interfaces

The [Product Name] complies with all applicable performance specification requirements when supplied with input power [Insert commentary on Electrical Power requirements, interfaces and exclusions/exceptions here]

6

DI-SESS-81876

Table II below is a typical table that might be used to describe the Electrical Interface requirements between connectors.   The table contains the signal names and pin assignments for each connector on the components, assemblies;

Table II Example of an Interface Signal definition table

Pin #	*Signal Name*	Type	Conductor	I/O	Description
JX-1	*26VDC_PWR*			*O*	*26VDC Power and Return for Component, Assembly, etc…*
JX-2	*26VDC_PWR_RTN*			*I*	
JX-3	*26VDC_PWR*			*O*	
JX-7	*26VDC_PWR_RTN*			*I*	
JX-4	*AUR_RS422_TX+*	*TIA/EIA-422-B*	*Twisted, shielded pair*	*O*	*Differential Data from the Launcher Controller to the Component, Assembly, etc…*
JX-8	*AUR_RS422_TX -*				

For each side of the interface plane (Platform, and Product) describe the electrical parameters. Consider the bulleted list below as topics that you might consider covering in your description.

- *Describe the Voltage characteristics of the interface*
- *Describe the Maximum Power of the interface*
- *Describe the Electrical Power Source Characteristics of the interface*
- *Describe the Electrical Load Performance Characteristics of the interface*

3.3.3   Electronic

This paragraph shall describe the Discrete Inputs and Outputs as appropriate. Consider the bulleted list below as topics that you might consider covering in your description as applicable.

- *Discrete Inputs*
- *Power ON / OFF Discrete Input*
- *General Purpose Discrete Input*
- *Discrete Inputs Logic Levels*
- *Input Power Interrupt Discrete Output*

3.3.4   Structural/Mechanical

This paragraph shall describe overall structural/mechanical characteristics, including any considerations not covered in subparagraphs as applicable.

3.3.4.1 Installation and Removal

The [Product Name] installed is detailed in this section. Insert photos, diagrams, drawings, etc. as needed to depict the detailed physical mounting as well as any specialized installation or removal procedures, advisories or instructions. Identify and/or reference any unique tools, transportability locks/unlocks, or calibration requirements. Specify any installation or removal considerations for fluid/gas connections; re-use vs. replacement of fasteners and seals/gaskets, cleanliness and protective gear requirements for maintenance personnel, and disposal of hazardous materials associated with installation or removal.

3.3.4.2 Hardware Envelopes

The [Product Name] interface critical design dimensions are shown in this section. Insert photos, diagrams, drawings, etc. as needed to depict the detailed envelope(s) including clearances for connectors, cooling, insulation, shock isolation, plumbing, tool access, removable-media access, optical zones, etc. Include gaskets, insulators/insulation, isolators, spacers, ties/straps, restraints for attached cables & hoses, tool clearances, etc. if not already detailed elsewhere in this document.

3.3.4.3 [System] Minimum Envelope Requirements

The [System] shall provide a specified volume (including sway space and shock isolation) of space for the [Product Name]. Include a diagram as needed.

The [System] shall provide space for the [Product Name] envelope shown in:
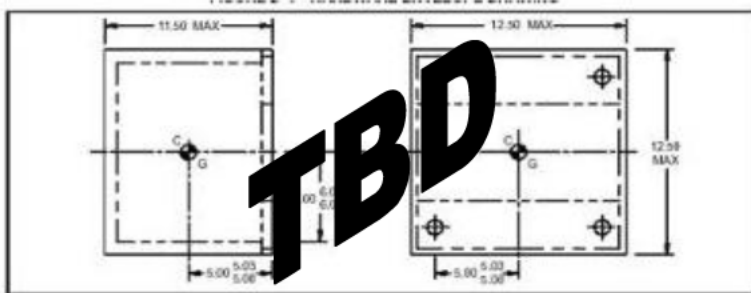
Figure 2: [Product Name] to [System] Envelope (TBD) (example)

3.3.4.4 [Product Name] Minimum Envelope Requirements

The [Product Name] shall not exceed a total of specified volume (including sway space and shock isolation) in volume. The [Product Name] envelope shall not exceed the dimensions shown in Figure 2 above: [Product Name] to [System] Envelope (TBD) (example)

3.3.4.5   Location and Orientation

The [Product Name] is mounted in the location and orientation as described in this section. Insert description and diagrams as needed. Identify and/or reference any additional orientation requirements such as viewing angles, sensor field-of-view, stowage considerations, adjustability, operator access to controls, maintenance accessibility, etc. if not specified in other sections of this document.

3.3.4.6   System fasteners

The recommended fastener to be used to attach the [System] to the [Product Name} is described in this section. Include reference to washers, torque, isolators, etc. as applicable. Identify and/or reference any unique tools, torquing sequence, fastener finishes, fastener ancillaries (e.g.: locking wire, staking, chemical thread-locker, anti-seize, etc.), and dielectric or galvanic considerations. Maximum use of standard components shall be considered.

3.3.4.7   Bonding

The Bonding cables are included in this section. Physical dimensions, corrosion resistance and conductivity requirements for the bonding cable(s) should be included, as well as details of attachment points on both the item and System. Include any dielectric or galvanic considerations. Electrical bonding to the vehicle support structure is provided by describe bonding cables here, including specs and attachment points.

3.3.4.8   Mass Properties

This section includes mass properties for the System and the product.

3.3.4.8.1 Weight

The [Product Name] weight is shown in this section. Weight of electrical cables, hoses and/or ductwork (if applicable) should also be specified if they are considered part of the item's installation and are not calculated as part of the System.   Any fluids or gases filling these conduits during normal operation should also be factored into calculations.

The [Product Name] weight is shown in following Table.

Component	Total Weight (lbs)	Total Weight (kilograms)
Configured LRU (incl Fasteners & Grounding Strap)	*26.0*	*11.79*
Vehicle Adapter	*5.5*	*2.49*
LRU w/ Adapter, as installed (Total)	*31.5*	*14.28*

Table 3: [Product Name] Mass Properties (example)

9

3.3.4.8.2 Center of Gravity

The center of gravity for the [Product Name] can be shown as a diagram. Insert diagram as needed. Center of gravity of electrical cables, hoses and/or ductwork (if applicable) should also be specified if they are considered part of the item's installation and are not calculated as part of the System. Any fluids or gases filling these conduits during normal operation should also be factored into calculations as applicable.

3.3.4.9   Materials

The [Product Name] materials are included in this section. Include surface finishes if not already detailed in the Hardware Envelopes section. Include gaskets, insulators/insulation, spacers, ties/straps, restraints for attached cables & hoses, etc. if not already detailed in the Hardware Envelopes section. Provide description for [System] Material requirements at the interface plane if any. Provide description for [Product Name] material requirements at the interface plane.

3.3.4.10 Vibration

The induced vibration spectrum in all axes is described in this section. Include reference to standardized System vibration profiles if applicable. For the [System] and for the [Product Name] include Vibration Tolerance requirements if applicable.

3.3.4.11 Shock

Specify maximum induced shock and/or tolerable shock in all axes. Indicate if any performance degradation is permitted after a shock event of specified magnitude, and/or whether a recovery period is permitted or recalibration procedure is needed to become fully-operational again.

3.3.4.12 Chemical Biological Radiological Nuclear (CBRN)

Indicate if any performance degradation is permitted after a CBRN event of specified severity, and/or whether a recovery period is permitted or recalibration procedure is needed to become fully-operational again.

3.3.4.13 Electromagnetic Environmental Effects (E3)

Indicate if any performance degradation is permitted after an E3 event of specified magnitude, and/or whether a recovery period is permitted or recalibration procedure is needed to become fully-operational again.

3.3.4.14 Human Factors

Identify and/or reference any ergonomic requirements such as viewing angles, stowage considerations, adjustability, operator access to controls(including while wearing MOPP or Arctic gear), maintenance accessibility, lift ability, etc. if not specified in other sections of this document.

3.3.4.15 Fluid

Identify any fluids (or specialty gases) and amounts required for installation and operation, including but not limited to coolants, hydraulic-power, cleansers, sealants, dielectric or galvanic compounds, etc. Specify if any fluids can pose hazards to System, personnel or environment if relevant, and reference handling precautions and procedures as applicable.

3.3.5   Connectivity

This paragraph shall describe physical connectors. Insert descriptions, diagrams and pin-out tables as needed. The table below provides an example of how you might consider describing connector interface information as applicable.

Table 4: [Product Name] Connectors (example)

Connector	Interface Type	Connector Manufacturer's Part Number	Recommended Mating Connector
J1	Power	D38999/24FE6P	D38999/26FE6S
J2	LONG Card Cage Signal	D38999/24FD35P	D38999/26FD35S
J3	LONG Card Cage Ethernet	TV07RQF25-8P	TV06RQF25-8S
J4	SHORT Card Cage Signal	D38999/24FD35PA	D38999/26FD35SA
J5	SHORT Card Cage Ethernet	TV07RQF25-8PA	TV06RQF25-8SA

Also as an example a diagram can be included to provide visual cue to connector layout. For example purposes you may provide the following brief narrative followed by a picture. The [Product Name] connectors are located on the front face of the [Product Name] as shown in:
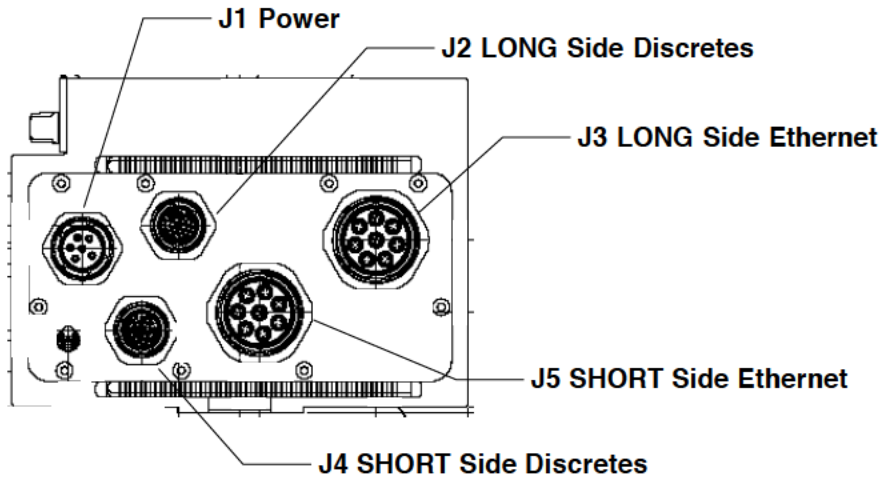
Figure 3: [Product Name] Connector Locations

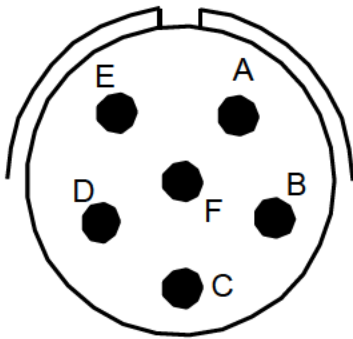*List each connector, such as Power Connector (J1) and provide a detail description for each.*

Figure 4: J1 Connector Pin Locations (example)

Pin No.	Signal Name	Signal Type	Signal Source	Signal Receiver	Signal Range	Current Load	Cable / Wire Size	Remarks
A	28VDC_INPUT	Power Input	Signal Source Product Name	[Signal Receiver Product Name]		23 amps max per pin size 12	12 AWG Copper	
B	28VDC_INPUT	Power Input	Signal Source Product Name	[Signal Receiver Product		23 amps max per pin size 12	12 AWG Copper	

12

DI-SESS-81876

				Name]				
C	28VDC_INPUT	Power Input	Signal Source Product Name	[Signal Receiver Product Name]		23 amps max per pin size 12	12 AWG Copper	
D	28VDC_INPUT _RETURN	Power Return	[Signal Source Product Name]	[Signal Receiver Product Name]		23 amps max per pin size 12	12 AWG Copper	
E	28VDC_INPUT _RETURN	Power Return	[Signal Source Product Name]	[Signal Receiver Product Name]		23 amps max per pin size 12	12 AWG Copper	
F	28VDC_INPUT _RETURN	Power Return	[Signal Source Product Name]	[Signal Receiver Product Name]		23 amps max per pin size 12	12 AWG Copper	

Table 5: J1 Connector Pin Assignments J1 Connector for Power Interface

3.3.5.1   Electronic Connectors

The [Product Name] has electrical connectors that are described in this section for the interfacing systems.

3.3.5.1.1 Connector (J2)

Each electronic connector is described in this subsection (and subsequent subsections as required). Consider the bulleted list below as topics that you might consider covering in your description.

- *Test Interfaces*
- *Serial Data Interface (RS-232)*
- *Universal Serial Bus (USB) Port*

3.3.6   Cable

This paragraph shall describe cables. Insert descriptions, diagrams and any information needed to specify the cable requirements. Consider the bulleted list below as topics that you might consider covering in your description as applicable.

- *Power Input Cable*

- *Wire Gauge Size*

- *Shield Termination*

- *Ethernet Interface Cable*

- *Cable Conductor Type*

- *Ethernet Contact Numbering*

- *Ethernet Cable Shield Termination*

- *Discrete Interface Cable*

- *Wire Gauge Size*

- *Shield Termination*

3.3.7   Grounds

This paragraph shall describe specific grounding requirements. Insert descriptions, diagrams and any information needed to specify the grounding requirements as applicable.

3.3.8   Environmental

This paragraph shall describe specific environmental considerations. Insert descriptions, diagrams and any information needed to specify the environmental requirements. Consider the bulleted list below as topics that you might consider covering in your description as applicable.

- *Thermal*

- *Passive Thermal*

- *Induced Thermal*

- *Structural*

- *[Product Name] Vibration Tolerance*

- *Acoustic*

3.3.9   Other Interface Requirements

 This section specifies the external interfaces to requirements of the system which are not in the same system.

3.4   Security and Integrity

If applied, describe how access security will be implemented and how data/information transmission security will be implemented for the interface being defined. Include a description of the transmission medium to be used. Include how data/information will be protected during transmission and how the data/information integrity will be guaranteed

4   Notes

This section contains any general information that aids in understanding the ICD (e.g. background information, glossary, abbreviations and acronyms, etc.)

5   Appendixes

Appendixes may be used to provide information published separately for convenience in document maintenance, (e.g. charts, classified data).   As applicable, each appendix shall be referenced in the main body of the document where the data would normally have been provided.   Appendixes may be bound as separate documents for ease in handling.

5.1   Abbreviations and Acronyms (examples below)

[Program Acronym]:   [Program Name]

ICD: Interface Control Document

NOTE: The Template Text provides guidance only.

The following references may be useful in defining content: ANSI/EIA-649B, National Consensus Standard for Configuration Management; ISO 10007, Quality Management-Guidelines for Configuration Management; and MIL-HDBK-61A, Configuration Management Guidance.

(Copies of ANSI/EIA-649B are available online at www.techamerica.org/ or from TechAmerica, 601 Pennsylvania Ave., NW, North Building, Ste 600, Washington DC 20004-2650. Copies of ISO 10007 is available online at http://www.iso.org/iso/home/standards.htm.)

END OF DI-SESS-81876