Background Statement for SEMI Draft Document 6185

Line-item Revision to SEMI E4-0699 (Reapproved 0612), SPECIFICATION FOR SEMI EQUIPMENT COMMUNICATIONS STANDARD 1 MESSAGE TRANSFER (SECS-I) to correct nonconforming title

NOTICE: This Background Statement is not part of the balloted item. It is provided solely to assist the recipient in reaching an informed decision based on the rationale of the activity that preceded the creation of this ballot.

NOTICE: For each Reject Vote, the Voter shall provide text or other supportive material indicating the reason(s) for disapproval (i.e., Negative[s]), referenced to the applicable section(s) and/or paragraph(s), to accompany the vote.

NOTICE: Recipients of this ballot are invited to submit, with their Comments, notification of any relevant patented technology or copyrighted items of which they are aware and to provide supporting documentation. In this context, 'patented technology' is defined as technology for which a patent has been issued or has been applied for. In the latter case, only publicly available information on the contents of the patent application is to be provided.

According to the SEMI Standards *Procedure Manual*, a Line-Item Ballot should include the Purpose, Scope, Limitations (if present), and Terminology (if present) sections, along with the full text of any section to which revisions are being balloted.

Background

This Line-Item Letter Ballot is issued in accordance with the Special Procedure of Appendix A4, § A4-1 of the *Procedure Manual* to correct nonconforming titles, and concomitant main body text, of published Standards Documents for which it is responsible. It is to be used at the time a Letter Ballot is to be issued for a Standards Documents with a nonconforming title as result of its five-year review or as part of a proposed revision.

Line Item 1:

Correct SEMI E4 nonconforming title per SEMI Standards *Procedure Manual*
from "SEMI Equipment Communications Standard 1 Message Transfer (SECS-I)"
to "Specification for SEMI Equipment Communications Standard 1 Message Transfer (SECS-I)"

Per the *Procedure Manual*, ¶ 3.4.3.3.1, a Line-item Ballot should include the Purpose, Scope, Limitations (if present), and Terminology (if present) sections, along with the full text of any section to which revisions are being balloted.

Voter requests for access to the full Standard or Safety Guideline must be made at least three business days before the voting deadline. Late requests may not be honored.

Notice: Additions are indicated by underline and deletions are indicated by ~~strikethrough~~.

The ballot results will be reviewed and adjudicated at the meetings indicated in the table below. Check www.semi.org/standards under Standards Calendar for the latest update.

Review and Adjudication Information

	Task Force Review	Committee Adjudication
Group:	Information and Control NA TC Chapter	Information and Control NA TC Chapter
Date:	July 12, 2017	July 12, 2017
Time & Time zone:	8:00 – 14:00 PM Pacific Time	8:00 – 14:00 Pacific Time
Location:	Marriott Marquis Hotel	Marriott Marquis Hotel
City, State/Country:	San Francisco, CA/USA	San Francisco, CA/USA
Leader(s):	Brian Rubow (Cimetrix) Jack Ghiselli (Ghiselli Consulting) James Moyne (University of Michigan)	Brian Rubow (Cimetrix) Jack Ghiselli (Ghiselli Consulting) James Moyne (University of Michigan)
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This meeting's details are subject to change, and additional review sessions may be scheduled if necessary. Contact the task force leaders or Standards staff for confirmation.

Telephone and web information will be distributed to interested parties as the meeting date approaches. If you will not be able to attend these meetings in person but would like to participate by telephone/web, please contact Standards staff.

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LETTER BALLOT

SEMI Draft Document 6185

Line-item Revision to SEMI E4-0699 (Reapproved 0612), SPECIFICATION FOR SEMI EQUIPMENT COMMUNICATIONS STANDARD 1 MESSAGE TRANSFER (SECS-I) to correct nonconforming title

LINE ITEM 1:

Correct SEMI E4 nonconforming title per SEMI Standards *Procedure Manual,* from "SEMI Equipment Communications Standard 1 Message Transfer (SECS-I)" to "Specification for SEMI Equipment Communications Standard 1 Message Transfer (SECS-I)"

This Standard was technically approved by the global Information & Control Technical Committee. This edition was approved for publication by the global Audits and Reviews Subcommittee on December 24, 2011. Available at www.semiviews.org and www.semi.org in June 2012; originally published in 1980; previously published March 2007.

NOTICE: This Document was reapproved with minor editorial changes.

1 Purpose

1.1 *Revision History* — This is the first major revision since the original release of SECS-I in 1980. Very little of the original intent of SECS-I has been altered, although there are a few significant additions. The changes are summarized in Appendix 1. This Specification has been developed in cooperation with the Japan Electronic Industry Development Association Committee 12 on Equipment Communications.

1.2 *Intent* — This Standard provides a means for independent manufacturers to produce equipment and/or hosts which can be connected without requiring specific knowledge of each other.

2 Scope

2.1 The SECS-I Standard defines a communication interface suitable for the exchange of messages between semiconductor processing equipment and a host. Semiconductor processing equipment includes equipment intended for wafer manufacturing, wafer processing, process measuring, assembly and packaging. A host is a computer or network of computers which exchange information with the equipment to accomplish manufacturing. This Standard includes the description of the physical connector, signal levels, data rate and logical protocols required to exchange messages between the host and equipment over a serial point-to-point data path. This Standard does not define the data contained within a message. The meaning of messages must be determined through some message content standard such as SEMI E5, SEMI Equipment Communications Standard 2 Message Content (SECS-II).

2.1.1 *Layered Protocol* — The SECS-I protocol can be thought of as a layered protocol used for point-to-point communication. The levels within SECS-I are the physical link, block transfer protocol, and message protocol (see Related Information 1, ¶ R1-1.1).

2.1.2 *Speed* — It is not the intent of this Standard to meet the communication needs of all possible applications. For example, the speed of RS-232 may be insufficient to meet the needs of transferring mass amounts of data or programs in a short period of time, such as might be required by high speed functional test applications.

2.1.3 *Network Support* — The method by which blocks of data are routed to a piece of equipment or find their way back to the proper host application is not specified by SECS-I. In a network, the roles of host and equipment might be assumed by any party in the network. In this situation, one end of the communications link must assume the role of the equipment and the other the role of the host.

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2.2 *Overview of SECS-I* — The SECS-I Standard defines point-to-point communication of data utilizing a subset of the international standard known in the U.S.A. as EIA RS-232-C and in Japan as JIS C 6361 for the connector and voltage levels. The actual transmission consists of 8-bit bytes sent serially with one start and one stop bit. The communication is bidirectional and asynchronous, but flows in one direction at a time. The direction is established by special characters and a handshake, after which the data itself is sent. Data is sent in blocks of 254 bytes or less. Each block consists of a 10-byte header followed by data. A message is a complete unit of communication in one direction and consists of 1 to 32,767 blocks. Each block header contains information for identifying the block as part of a specific message. Messages are paired by a request and its reply which together are called a transaction.

2.3 *Structure of Document* — This Document is divided into sections which correspond to major aspects of the Standard. The sections outline requirements as well as implications of the requirements. The Standard may be implemented in a variety of ways, depending upon the computer environment where it is placed. Implementation is not part of the standard. Information which may be useful for implementation is included in the form of Related Information.

NOTICE: SEMI Standards and Safety Guidelines do not purport to address all safety issues associated with their use. It is the responsibility of the users of the Documents to establish appropriate safety and health practices, and determine the applicability of regulatory or other limitations prior to use.

3 Referenced Standards and Documents

3.1 *SEMI Standards and Safety Guidelines*

SEMI E5 — SEMI Equipment Communications Standard 2 Message Content (SECS-II)

SEMI E6 — Guide for Semiconductor Equipment Installation Documentation

3.2 *Electronics Industries Association (EIA) Standards*[1]

EIA RS-232-C — Interface between Data Terminal Equipment and Data Communication Equipment Employing Serial Binary Data Interchange

EIA RS-269-B — Synchronous Signaling Rates for Data Transmission

EIA RS-334 — Signal Quality at Interface Between Data Processing Terminal Equipment and Synchronous Communication Equipment for Serial Data Transmission

EIA RS-422 — Electrical Characteristics of Balanced Voltage Digital Interface Circuits

EIA RS-423 — Electrical Characteristics of Unbalanced Voltage Digital Interface Circuits

3.3 European Computer Manufacturing Association[2]

ECMA/TC24/82/18 — Network Layer Principles, Final Draft (April, 1982)

3.4 *International Organization for Standardization (ISO) Standards*[3]

ISO 2110-1980 — Data Communications, Interface Connectors and Pin Assignment

3.5 *Japanese Industrial Standards Committees (JIS) Standards*[4]

JIS C 6361 — The Interface between Data Circuit Terminating Equipment (DCE) and Data Terminal Equipment (DTE) (25-pin Interface)

3.6 **NOTICE:** Unless otherwise indicated, all documents cited shall be the latest published versions.

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[1] Electronic Industries Alliance, EIA Engineering Department, Standards Sales Office, 2001 Eye Street, NW, Washington, D.C. 20006, USA; http://www.eia.org

[2] European Computer Manufacturing Association, 114 Rue du Rhone, 1204 Geneva, Switzerland

[3] International Organization for Standardization, ISO Central Secretariat, 1 rue de Varembé, Case postale 56, CH-1211 Geneva 20, Switzerland; Telephone: 41.22.749.01.11, Fax: 41.22.733.34.30, http://www.iso.ch

[4] Japanese Standards Association, 4-1-24 Akasaka, Minato-ku, Tokyo 107-8440, Japan; Telephone: 81.3.3583.8005, Fax: 81.3.3586.2014, http://www.jsa.or.jp

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4 Terminology

4.1 *Definitions*

4.1.1 *ACK* — 'Correct Reception' handshake code.

4.1.2 *application software* — the software performing the specific task of the equipment or the host.

4.1.3 *block* — header plus up to 244 bytes of data.

4.1.4 *block length* — the number of bytes sent in the block transfer protocol.

4.1.5 *block number* — a 15-bit field in the header for numbering blocks in a message.

4.1.6 *character* — a byte sent on the SECS-I serial line.

4.1.7 *checksum* — a 16-bit number used to detect transmission errors.

4.1.8 *communication failure* — a failure in the communication link resulting from a failed send.

4.1.9 *device ID* — a 15-bit field in the header used to identify the equipment.

4.1.10 *E-bit* — a bit in the header identifying the last block of a message.

4.1.11 *ENQ* — 'Request to Send' handshake code.

4.1.12 *EOT* — 'Ready to Receive' handshake code.

4.1.13 *equipment* — the intelligent system which communicates with a host.

4.1.14 *expected block* — the block of a message which is expected by the message protocol.

4.1.15 *header* — a 10-byte data element used by the message and transaction protocols.

4.1.16 *host* — the intelligent system which communicates with the equipment.

4.1.17 *length byte* — the character used to establish the block length during transmission.

4.1.18 *line control* — a portion of the block transfer protocol.

4.1.19 *master* — the block transfer designation for the equipment.

4.1.20 *message* — a complete unit of communication.

4.1.21 *message ID* — a 15-bit field in the header used in the process of message identification.

4.1.22 *multi-block message* — a message sent in more than one block.

4.1.23 *NAK* — 'Incorrect Reception' handshake code.

4.1.24 *open message* — a multi-block message for which not all of the blocks have been received.

4.1.25 *open transaction* — a transaction in progress.

4.1.26 *primary message* — a message with an odd numbered message ID. Also the first message of a transaction.

4.1.27 *primary/secondary attribute* — the least significant bit of the lower message ID which indicates whether a block belongs to a primary or secondary message.

4.1.28 *R-bit* — a bit in the header signifying the direction of the message.

4.1.29 *receiver* — the end of the SECS-I link receiving a message.

4.1.30 *reply* — the particular secondary message corresponding to a primary message.

4.1.31 *reply linking* — the process of forming a transaction out of a primary and a secondary message.

4.1.32 *retry count* — the number of unsuccessful attempts to send a block in the block transfer protocol.

4.1.33 *retry limit (RTY)* — the retry limit or the number of times the block transfer protocol will attempt to retry sending a block before declaring a failed send.

4.1.34 *secondary message* — a message with an even numbered message ID. Also the second message of a transaction.

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4.1.35 *sender* — the end of the SECS-I link sending message.

4.1.36 *slave* — the block transfer designation for the host.

4.1.37 *system bytes* — a 4-byte field in the header used for message identification.

4.1.38 *T1* — receive inter-character timeout in the block transfer protocol.

4.1.39 *T2* — protocol timeout in the block transfer protocol.

4.1.40 *T3* — reply timeout in the message protocol.

4.1.41 *T4* — inter-block timeout in the message protocol.

4.1.42 *transaction* — a primary message and its associated secondary message, if any.

4.1.43 *W-bit* — a bit in the header signifying that a reply is expected.

NOTICE: SEMI makes no warranties or representations as to the suitability of the Standards and Safety Guidelines set forth herein for any particular application. The determination of the suitability of the Standard or Safety Guideline is solely the responsibility of the user. Users are cautioned to refer to manufacturer's instructions, product labels, product data sheets, and other relevant literature, respecting any materials or equipment mentioned herein. Standards and Safety Guidelines are subject to change without notice.

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<end of ballot>