SEMI E139.2-0708
SECS-II PROTOCOL FOR RECIPE AND PARAMETER MANAGEMENT (RaP)

This standard was technically approved by the global Information & Control Committee. This edition was approved for publication by the global Audits and Reviews Subcommittee on May 13, 2008. It was available at www.semi.org in June 2008 and on CD-ROM in July 2008. Originally published July 2006; previously published November 2007.

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1 Purpose

1.1 This specification provides a mapping of the RaP communication services to the SECS-II protocol.

2 Scope

2.1 The scope of this specification is the accurate representation of RaP services as defined in SEMI E139 in SECS-II format.

2.2 Excluded from the scope of this specification is the addition of new technical concepts except as needed to complete the mapping of SEMI E139 to SECS-II.

NOTICE: This standard does not purport to address safety issues, if any, associated with its use. It is the responsibility of the users of this standard to establish appropriate safety and health practices and determine the applicability of regulatory or other limitations prior to use.

3 Limitations

3.1 None.

4 Referenced Standards and Documents

4.1 *SEMI Standards*

SEMI E4 — SEMI Equipment Communications Standard 1 Message Transfer (SECS-I)

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

SEMI E37 — High-Speed SECS Message Services (HSMS) Generic Services

SEMI E139 — Recipe and Parameter Management (RaP)

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

5 Terminology

5.1 *Abbreviations and Acronyms*

5.1.1 None.

5.2 *Definitions*

5.2.1 None.

6 Requirements

6.1 *Overview*

6.1.1 This section specifies all the additional requirements for implementations of SEMI E139 using SECS-II messaging. It will first address the SECS communication link details. Then it will provide tables to map the RaP services and their parameters to the corresponding SECS-II messages and data items. Next, it addresses the transfer of recipes. And finally, it specifies the format of the *TransferContainer*.

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6.1.2 *Assumptions*

6.1.2.1 *T3 Timeout* — There is a chance that the processing of some primary messages can take longer than the reply timeout (T3). For example, the Verify *PDE* message must perform the verification process within the T3 time period. The implementer is expected to characterize this risk and (a) mitigate this risk by optimizing the implementation and (b) advise the user on how to avoid this potential issue (e.g., suggesting the proper value for the T3 timer).

6.2 *SECS Communication Link Detail*

6.2.1 This specification addresses SECS-II [SEMI E5] based protocols for interaction between semiconductor equipment, recipe editors, and the Factory Information and Control System (FICS).

6.2.2 All SECS communication links are asymmetric. One participant must be designated as the "Host" and the other must be designated as the "Equipment." In the RaP services as defined in SEMI E139, this asymmetry does not exist. Most RaP services may be offered by any *RaPnode*.

6.2.3 To promote a proper mapping from RaP to SECS-II, this specification assigns the role of Host or Equipment to each participant in each of the possible *RaPnode* communication combinations: FICS – Equipment, FICS – Editor, and Editor – Equipment. This specification does not define support for communication between two *RaPnodes* of the same type.

6.2.4 Figure 1 illustrates the three communication links addressed in this specification. RaP FICS services shall be offered only by a *RaPnode* configured as a SECS "Host." RaP Equipment services shall be offered only by a *RaPnode* configured as a SECS "Equipment." The *EditorNode* takes both roles. When the Editor is linked to the FICS, it shall act in the role of "Equipment." When the Editor is linked to an Equipment, it shall act in the role of "Host."

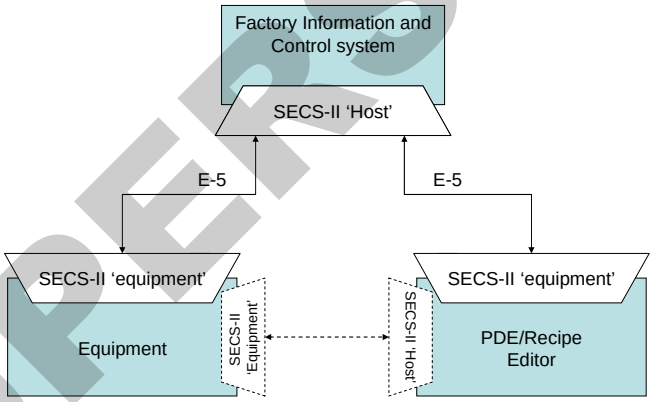

Figure 1
SECS Communication Link

6.3 *Mapping of RaP Services*

6.3.1 Table 1 lists each RaP service and the corresponding SECS-II message. The *sendPDE()* service maps to two SECS-II messages because of the way *TransferContainers* are handled. See § 6.5 for more on the transfer of *TransferContainers*.

Table 1 Service to Message Mapping

Service Name	*Stream/Function*	*SECS-II Message Name*
getPDEdirectory()	S19,F1/F2	Get *PDE* Directory/*PDE* Directory Data
deletePDE()	S19,F3/F4	Delete *PDE*/Delete *PDE* Acknowledge

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Service Name	*Stream/Function*	*SECS-II Message Name*
getPDEheader()	S19,F5/F6	Get *PDE* Header/*PDE* Header Data
getPDE()	S19,F7/F8	Get *PDE*/*PDE* Data
requestToSendPDE()	S19,F9/F10	Request To Send *PDE*/Send *PDE* Grant
sendPDE()	S19,F11/F12 S19,F13/F14	Send *PDE*/Send *PDE* Acknowledge *TransferContainer* Report/Acknowledge
resolvePDE()	S19,F15/F16	Resolve *PDE* Request/Resolve *PDE* Data
verifyPDE()	S19,F17/F18	Verify *PDE*/Verify *PDE* Data

6.4 *Mapping of RaP Services Parameters*

6.4.1 This section provides a mapping of the parameters of the RaP Services to the data items in the associated SECS-II messages. Please see SEMI E139, Table 16 for the definitions and formats of the parameters and SEMI E5, Table 3 for the corresponding definitions and formats of the data items.

6.4.2 Each status parameter (those ending in "Stat") was defined in SEMI E139 to be of type "Error." The form of Error is intended to be defined in each protocol mapping sub-specification. The mapping of this Error type to SECS-II consists of two data items that appear together. The first is an enumeration with the same name as the status parameter. The second is a string called "STATUSTXT." The STATUSTXT string provides an opportunity to give additional detail about the problem.

6.4.2.1 The data item STATUSTXT has been added to all status parameters in Table 2. The mapping in the table shows each status parameter in the left column and the two resulting SECS-II data items in the right column. These two items are inserted in the SECS-II message structures together within a given list (not as a separate list of two items). For example, in Table 2 see delRspStat in the third row. It is mapped to data items DELRSPSTAT and STATUSTXT. They become part of the delRspInfo list above, making it a list of three items. This approach is used for all these status parameters.

6.4.2.2 All status parameters have enumerated status codes defined by SEMI E139. No implementation defined status codes can be allowed since SEMI E139 does not provide for them. The implementation may report other status conditions by using the "Other" enumeration value and describing the issue in the corresponding STATUSTXT data item.

Table 2 Service Parameter to Message Data Item Mapping

RaP Service Parameter	*SECS-II Data Item or Structure*
delRspInfo	L,n 1. L,3 1. <UID$_1$> 2. <DELRSPSTAT$_1$> 3. <STATUSTXT$_1$> . . n. L,3 1. <UID$_n$> 2. <DELRSPSTAT$_n$> 3. <STATUSTXT$_n$>
delRspStat	<DELRSPSTAT> <STATUSTXT>
dirRspStat	<DIRRSPSTAT> <STATUSTXT>

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