SEMI E90.1-0312
SPECIFICATION FOR SECS-II PROTOCOL SUBSTRATE TRACKING

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1 Purpose

1.1 This Document maps the services and data of SEMI E90 to SECS-II streams and functions, and data definitions.

2 Scope

2.1 This is a Specification covering equipment supporting automated substrate tracking.

2.2 This Document applies to all implementations of SEMI E90 that use the SECS-II message protocol (SEMI E5). Compliance to this Standard requires compliance to both SEMI E90 and SEMI E5.

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

SEMI E30 — Specification for the Generic Model for Communications and Control of Manufacturing Equipment (GEM)

SEMI E39.1 — Specification for SECS-II Protocol for Object Services (OSS)

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

4 Mapping

4.1 This section shows the specific SECS-II streams and functions that shall be used for SECS-II implementation of the services defined in SEMI E90, as well as the parameter mapping for data attached to services.

4.2 *Message Mapping*

4.2.1 *Services Message Mapping* — Table 1 defines the relationships between SEMI E90 services and SECS-II messages.

4.2.2 *Event Message Mapping* — Table 2 defines the relationships between SEMI E90 collection events and SECS-II messages.

Table 1 Services Message Mapping Table

Service Name	*Stream, Function*	*SECS-II Message Name*
registers substrate	S14,F9/10	Create Object Request/Acknowledge (SEMI E39.1)
remove substrate	S14,F11/12	Delete Object Request/Acknowledge (SEMI E39.1)
UpdateSubstrateObject	S14F19/F20	Generic Service Request/Acknowledge
ProceedWithSubstrate	S14F19/F20	Generic Service Request/Acknowledge
CancelSubstrate	S14F19/F20	Generic Service Request/Acknowledge

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Table 2 Event Message Mapping Table

Event Name	*Stream, Function*	*SECS-II Message Name*
All state model transitions	S6F11/12	Event Report Send/Acknowledge

4.3 *Parameter Mapping* — Table 3 defines the relationships between SEMI E90 service parameters and SECS-II data definitions.

Table 3 Service Parameters to SECS-II Data Items Mapping

Parameter Name	*Range*	*SECS-II Data Item*
ErrorCode	Enumerated.	ERRCODE
ErrorText	1 to 80 characters.	ERRTEXT
ObjectAction	'UpdateSubstrateObject'	SVCNAME
ObjectActionStatus	List of service acknowledge and status.	L,2 1. SVCACK 2. Status
ObjectAction ParameterResult	(List of) name value pairs providing information about the attributes successfully set.	L,n 1. L,2 1. $SPNAME_1$ 2. $SPVAL_1$: n. L,2 1. $SPNAME_n$ 2. $SPVAL_n$
ObjectLinkID	51.	LINKID
OperationID	51.	OPID
STAcknowledge	0 if success; 1 if error (Conforms to ObjAck in SEMI E39.1).	OBJACK
Status	List of error information.	L,n n = number of errors 1. L,2 1. <$ErrorCode_1$> 2. <$ErrorText_1$> . . n. L,2 1. <$ErrorCode_n$> 2. <$ErrorText_n$>
STStatus	STAcknowledge and Status.	L,2 1. <STAcknowledge> 2. <Status>
SubstID	1–80 characters (Conforms to ObjID in SEMI E39.1).	OBJID
SubstIDList (ordered list of)	List of Substrate IDs.	L,n n = number of substrate identifiers 1. <$SubstID_1$> . . n. <$SubstID_n$>
SubstLocID	1–80 characters (Conforms to ObjID in SEMI E39.1).	OBJID

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Parameter Name	*Range*	*SECS-II Data Item*
SubstLocIDList (ordered list of)	List of Substrate Location ID's corresponding to the SubstIDList (ordered list of).	L,n n = number of substrate identifiers in SubstIDList (ordered list of) 1. <SubstLocID$_1$> . . n. <SubstLocID $_n$>
SubstProcState	Enumerated per Variable SubstProcState.	U1
SubstProcStateList (ordered list of)	List of Substrate Processing States corresponding to the SubstIDList (ordered list of).	L,n n = number of substrate identifiers in SubstIDList (ordered list of) 1. <SubstProcState$_1$> . . n. <SubstProcState $_n$>
SubstrateObject-Attributes	(List of) substrate object attribute names and values.	L,n 1. L,2 1. SPNAME$_1$ 2. SPVAL$_1$: n. L,2 1. SPNAME$_n$ 2. SPVAL$_n$
SubstState	Enumerated per Variable SubstState.	U1
SubstStateList (ordered list of)	List of Substrate Transport States corresponding to the SubstIDList (ordered list of).	L,n n = number of substrate identifers in SubstIDList (ordered list of) 1. <SubstState$_1$> . . n. <SubstState $_n$>

4.4 *SECS-II Data Items Without Corresponding SEMI E90 Parameters* — Table 4 contains the SECS-II data items that do not correspond to SEMI E90's service parameter.

Table 4 Additional Data Item Requirements Table

Function	*SECS-II Data Item*
"TimeIn" from SubstHistory variable data definition	TIMESTAMP.
"TimeOut" from SubstHistory variable data definition	A[0] if the substrate(s) remain in the location. TIMESTAMP if the substrate(s) have departed the location.

5 Variable Data Item Mapping

5.1 Table 5 shows the specific SECS-II data classes, and formats needed for SECS-II implementations of SEMI E90 variable data items.

Table 5 Variable Data Item Mapping

Variable Name	*Class*	*Format*
AcquiredID	DVVAL	A[1..80] (Conforms to ObjID in SEMI E39.1)

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