

SEMI E50-95 (Withdrawn 0600) INTEGRATED SMIF INDEXER APPLICATION MODEL FOR THE SENSOR/ACTUATOR NETWORK

NOTE: This document was balloted and approved for withdrawal in 2000.

1 Purpose

This standard defines an application level device model for integrated SMIF indexers.

2 Scope

The scope of this specification is to ensure the interoperability of integrated SMIF indexers with semiconductor processing equipment controllers on the application level. This specification defines the commands accepted, messages provided, and variables maintained and sent on request by an Integrated SMIF Indexer. This document complements SEMI E54 (*Sensor/Actuator Network Standard*) and SEMI E54.1 (*Standard for Sensor/Actuator Network Common Device Model*).

3 Limitations

3.1 This specification applies to Integrated SMIF Indexers only.

3.2 This specification does not include capabilities that are common to all sensors, actuators, and equipment subcomponents. Common capabilities are specified in the Common Device Model referenced below.

4 Referenced Documents

4.1 SEMI Documents

SEMI E5 — SEMI Equipment Communications Standard II

SEMI E19 — Standard Mechanical Interface (SMIF)

SEMI E44 — Guide for Procurement and Acceptance of Minienvironments

SEMI E48 — Specification for SMIF Indexer Volume Requirement

SEMI E54 — Sensor/Actuator Network Standard

SEMI E54.1 — Standard for Sensor/Actuator Network Common Device Model

Terminology for Minienvironments — Workshop Proceedings, April 2, 1993

5 Terminology

5.1 *pod* — a box having a standard mechanical interface (SMIF).

5.2 *integrated SMIF indexer* — device including a SMIF-compatible port plate per SEMI E19 and a port door lift capable of indexing/positioning vertically per SEMI E48.

5.3 *standard mechanical interface (SMIF)* — interface plane between pod and another minienvironment per SEMI E19.

For a list of additional related definitions, see SEMI E44.

6 Requirements

6.1 *Commands* — An integrated SMIF indexer is required to accept the commands described below. All commands except the Request Variable Value command can be received by the indexer only in the idle state (see 6.4) and are replied to with the respective indexer reply described in 6.2, when the related activity is completed. The Request Variable Value command can be received by the indexer in the idle state and the processing state and is replied to with the respective reply.

Table 1 Description

Cmd Name — Name of the command to be provided.

Cmd Variable — Variable to which the command value is written by the host.

Cmd Format — Format of the command.

Cmd Value — Variable value representing the command.

Argument — Optional argument of the command.

Argument Format

51 = 1 Byte integer;

u 1 51 = one single 1 Byte unsigned integer

10 = Binary Byte (buffer data — no explicit data type);

b 8 10 = array of 8 binary bytes

Argument Values — Specification of the values of the argument field.

Comment — Description

Table 1 Required Commands

<i>Cmd Name</i>	<i>Cmd Variables</i>	<i>Cmd Format</i>	<i>Cmd Value</i>	<i>Argument</i>	<i>Argument Format</i>	<i>Argument Values</i>	<i>Comment</i>
Reset	Command Variable	u 1 51	1				reset the indexer (this command may include hardware-specific steps like referencing servo drives) and go to zero position
Open	Command Variable	u 1 51	2				open the pod
Close	Command Variable	u 1 51	3				close the pod
Home	Command Variable	u 1 51	4				move the port plate to the home (top) position
Put	Command Variable	u 1 51	5	Position	u 1 51	1 ... 25	move the slot specified in the Position argument to the wafer loading/unloading plane in order to unload a wafer
Get	Command Variable	u 1 51	6	Position	u 1 51	1 ... 25	move the slot specified in the Position argument to the wafer loading/unloading plane in order to load a wafer
Lift	Command Variable	u 1 51	7				lift the indexer up for half a slot to load a wafer from a handling device without vertical movement
Free	Command Variable	u 1 51	8				go down for half a slot to place a wafer on a handling device without vertical movement
	Command Variable	u 1 51	9 ... 255				values 9 ... 255 are free for supplier-specific features
Request Variable Value	Request Variable	u 1 51	Variable Identification Code				request a variable by writing the Variable Identification Code into the Request Variable (for a list of variables and Variable Identification Codes, see 6.3)

The command Request Variable Value is written to the Request Variable. The other required commands are written to the Command Variable. A manufacturer may implement additional command variables and command values to provide specific features.

6.2 Indexer Replies — An integrated SMIF indexer is required to send the messages described below whenever the respective activity initiated by a command is completed.

Table 2 Description

Indexer Reply Name — Name of the reply to be provided.

Reply Variable — Variable (containing the reply value) to be updated in the network.

Reply Format — See 6.1.

Reply Values and Description — Specification of the reply values and description.