

# SECS/GEM DOCUMENTATION

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FOR EQUIPMENT:  
**BIOMETRIC-ASSEMBLY**

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REVISION

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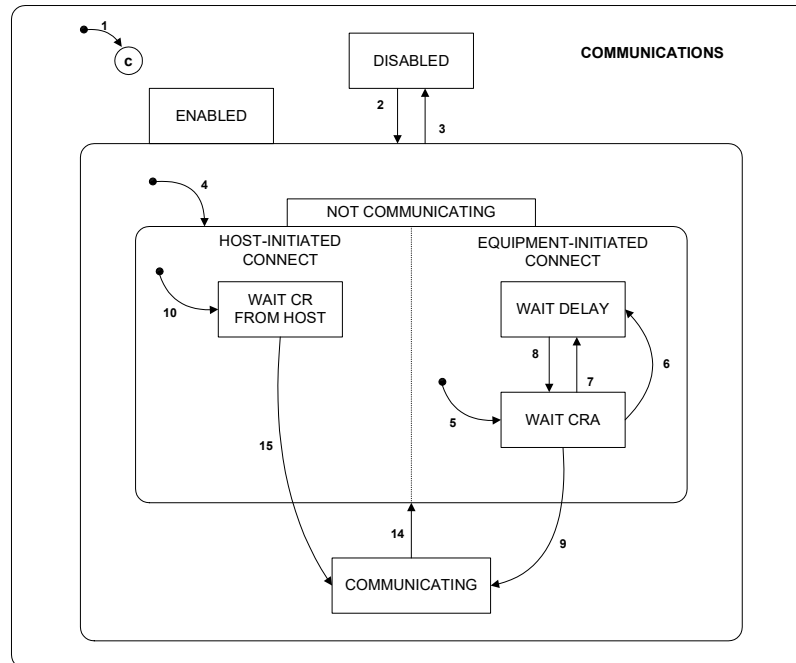
## GEM STATE MODELS

### COMMUNICATION STATE MODEL

#### 1. GENERAL DESCRIPTION

The Communications State Model defines the behavior of the equipment in relation to the existence or absence of a communications link with the host. Two major states of SECS communication protocols are DISABLED and ENABLED. The ENABLED state has two sub states, NOT COMMUNICATING and COMMUNICATING.

#### 2. COMMUNICATIONS STATE DIAGRAM



#### 3. STATE DEFINITIONS

##### DISABLED

The equipment does not desire SECS-II communication with a host computer. If the operator switches from ENABLED to DISABLED, all SECS-II communications will cease immediately. Any unsent messages are discarded. All further actions on any open transactions and conversations are terminated. Refer to SEMI E5 for definitions of SECS-II transaction and conversation protocols. The DISABLED State may be the system default.

##### ENABLED

The equipment desires SECS-II communication with a host computer. ENABLED has two substates, COMMUNICATING and NOT COMMUNICATING. Whenever communications are enabled, either during system initialization or through operator selection, the substate of NOT COMMUNICATING is active until communications are formally established. Lower-level protocols (such as SECS-I or HSMS-SS) are assumed to be functioning normally in that they are capable of supporting the communication of SECS-II syntax. The ENABLED State may be the system default.

##### NOT COMMUNICATING

Only messages S1, F13, S1, F14, and Stream 9 are sent while this substate is active. The equipment discards any messages received from the host other than S1, F13 or S1, F14. It periodically attempts to establish communication

with a host computer by issuing an S1, F13 until communications are successfully established. Only one equipment-initiated S1, F13 transaction is open at any time.

The NOT COMMUNICATING state has two substates, HOST-INITIATED CONNECT and EQUIPMENT-INITIATED CONNECT. Both are active whenever the equipment is NOT COMMUNICATING. These substates clarify the behavior of the equipment in the event that both the equipment and the host attempt to establish communications during the same period of time. Note that in the Harrel notation, an exit from any substate is an exit from the parent state and thus from all other substates of that parent substate.

---

## EQUIPMENT-INITIATED CONNECT

This state has two substates, WAIT CRA and WAIT DELAY. Upon any entry to the NOT COMMUNICATING State, whenever EQUIPMENT-INITIATED CONNECT first becomes active, a transition to WAIT CRA occurs. The CommDelay timer is then set to “expired,” and an immediate attempt to send S1, F13 is made.

---

### WAIT CRA

An establish-communications request has been sent. The equipment waits for the host to acknowledge the request.

---

### WAIT DELAY

A connection-transaction failure has occurred. The CommDelay timer has been initialized. The equipment waits for the timer to expire.

---

## HOST-INITIATED CONNECT

This state describes the behavior of the equipment in response to a host-initiated S1, F13 while NOT COMMUNICATING is active.

---

### WAIT CR FROM HOST

The equipment waits for an S1, F13 from the host. If an S1, F13 is received, the equipment attempts to send an S1, F14 with COMMACK = 0.

---

## COMMUNICATING

Communications have been established between the equipment and host. The equipment may receive any message from the host, including S1, F13. When the equipment is COMMUNICATING, SECS communications with a host computer must be maintained. This state remains active until communications are disabled or a communication failure occurs. If the equipment receives S1, F13 from the host while in the COMMUNICATING substate, it should respond with S1, F14 with COMMACK set to zero. If the equipment receives S1, F14 from a previously sent S1, F13, and no action is required.

In case of communication failure, the equipment returns to the NOT COMMUNICATING substate and attempts to re-establish communications with the host.

It is possible that the equipment will be waiting for an S1, F14 from the host in EQUIPMENT-INITIATED CONNECT/WAIT CRA when an S1, F13 is received from the host in HOST-INITIATED CONNECT/WAIT CR FROM HOST. When this situation occurs, both equipment and host have an open S1, F13/S1, F14 transaction. Since communications are successfully established on the favorable completion of any S1, F13/S1, F14 transaction, either of these two transactions may be the first to complete successfully and to cause the transition from NOT COMMUNICATING to COMMUNICATING. In this event, the other transaction remains open regardless of the transition to COMMUNICATING until it is closed in a normal manner.

If the equipment has not yet sent an S1, F14 to a previously received S1, F13 at the time when COMMUNICATING becomes active, the S1, F14 response is sent in a normal manner. This includes transmissions that may have started but not yet successfully completed at the time that the transition to COMMUNICATING occurs. A failure to send the S1, F14 is then treated as any other communication failure. S1, F13/S1, F14

If the equipment-initiated transaction (S1F13/F14) is still open when the transition to COMMUNICATING occurs, then a subsequent failure to receive a reply from the host is considered a communication fault by the equipment. An S9, F9 is sent when a transaction timer timeout occurs.



#	Current State	Trigger	New State	Action	Comment
1	(Entry to COMMUNICATIONS)	System initialization	System Default	None	The system default may be set to DISABLED OR ENABLED.
2	DISABLED	Operator switches from DISABLED to ENABLED	ENABLED	None	SECS-II communications are enabled. SECS-II communications are enabled.
3	ENABLED	Operator switches from ENABLED to DISABLED	DISABLED	None	SECS-II communications are prohibited.
4	(Entry to ENABLED)	Any entry to ENABLED state.	NOT COMMUNICATING	None	May enter from system initialization to ENABLED or through operator switch to ENABLED.
5	(Entry to EQUIPMENT-INITIATED CONNECT)	(Any entry to NOT COMMUNICATING)	WAIT CRA	Initialize communications. Set CommDelay timer "expired." Send S1, F13	Begin the attempt to establish communications.
6	WAIT CRA	Connection transaction failure.	WAIT DELAY	Initialize CommDelay timer.	Wait for timer to expire.
7	WAIT DELAY	CommDelay timer expired	WAIT CRA	Send S1, F13	Wait for S1, F14. May receive S1, F13 from Host.
8	WAIT DELAY	Received a message other than S1, F13	WAIT CRA	Discard message. No reply. Set CommDelay timer "expired". Send S1, F13.	Indicates opportunity to establish communications.
9	WAIT CRA	Received expected S1, F14 with COMMACK=0	COMMUNICATING	None.	Communications established.
10	(Entry to HOST-INITIATED CONNECT)	(Any entry to NOT COMMUNICATING)	WAIT CR FROM HOST	None.	Wait for S1, F13 from Host.
14	COMMUNICATING	Communication failure	NOT COMMUNICATING	Dequeue all messages queued to send.	Dequeued messages may be placed in spool buffer as appropriate.
15	WAIT CR FROM HOST	Received S1,F13	COMMUNICATING	Send S1,F14 with COMMACK = 0	Communications are established.

## 5. RELATED VARIABLES, CONSTANTS AND EVENTS

For complete descriptions, refer to the Appendix.

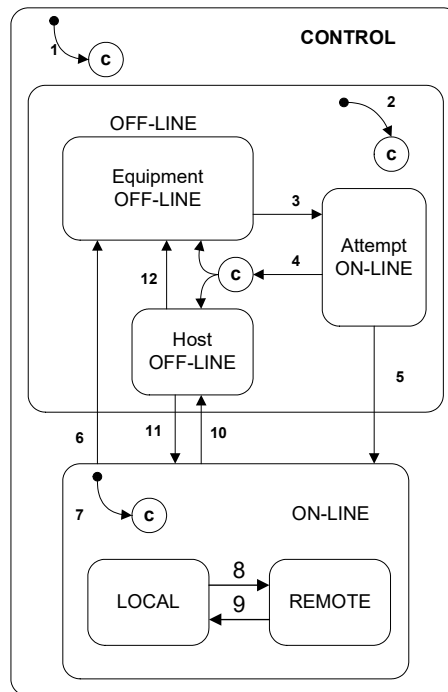
Name	Type
EstablishCommunicationsTimeout	Equipment Constant
DefaultCommState	Equipment Constant
CommState	Status Variable
CommEnableSwitch	Status Variable

## CONTROL STATE MODEL

### 6. GENERAL DESCRIPTION

The Control State Model defines the level of cooperation between the host and equipment. This model also specifies how the operator may interact at the different levels of host control and defines the equipment's responsibility to act upon messages that it receives. Three levels of control exist. The highest level, REMOTE, allows the host to control the equipment to the full extent possible. The middle level, LOCAL, allows the host to access all information, but places some limitations on how the host may control equipment operation. The lowest level, OFF-LINE, allows no host control and no access.

### 7. CONTROL STATE DIAGRAM



### 8. CONTROL STATE DEFINITIONS

#### OFF-LINE

When the OFF-LINE State is active, operation of the equipment is only performed by the operator at the operator console. Message transfer is severely restricted. The equipment will respond with an Sx, F0 to any primary message from the host other than S1, F13 or S1, F17. It will process and respond to S1, F13 (establishment of communications) and S1, F17 (host request to activate the ON-LINE State). The equipment will accept the S1, F17 and send a positive response only when the HOST OFF-LINE state is active (see transition 11 in the Control State Transition Table).

While the OFF-LINE State is active, the equipment will not send any primary messages other than S1, F13, S9, Fx, and S1, F1 (see ATTEMPT ON-LINE substate). Sending of S1, F13 is based upon the COMMUNICATIONS State Model. S9, Fx messages is issued only in response to the messages to which the equipment will normally respond while OFF-LINE (i.e., S1, F13 and S1, F17). If the equipment receives a reply message from the host other than S1, F14 or S1, F2, this message is discarded.

No messages enter the spool when the system is OFF-LINE. Spooling may be active when the Communications State of NOT COMMUNICATING is active. This might occur during OFF-LINE, but since the equipment will not attempt to send messages except as mentioned in the previous paragraph, no messages will enter the spool. The equipment may send S1, F1 or S1, F13, but since Stream 1 messages are not eligible for spooling, they will not enter the spool.

OFF-LINE has three substates: EQUIPMENT OFF-LINE, ATTEMPT ON-LINE, and HOST OFF-LINE.

---

## EQUIPMENT OFF-LINE

While this state is active, the system maintains the OFF-LINE State. It awaits operator instructions to attempt to go ON-LINE.

---

## ATTEMPT ON-LINE

While the ATTEMPT ON-LINE State is active, the equipment has responded to an operator instruction to attempt to go to the ON-LINE State. Upon activating this state, the equipment attempts to send an S1, F1 to the host. Note that when this state is active, the system does not respond to operator actuation of either the ON-LINE or the OFF-LINE switch.

---

## HOST OFF-LINE

While the HOST OFF-LINE state is active, the operator's intent is that the equipment be ON-LINE. However, the host has not agreed. Entry to this state may be due to a failed attempt to go ON-LINE or to the host's request that the equipment go OFF-LINE from ON-LINE (see the Control State Transition Table for more detail). While this state is active, the equipment positively responds to any host's request to go ON-LINE (S1, F17). Such a request is denied when the HOST OFF-LINE State is not active.

---

## ON-LINE

While the ON-LINE State is active, SECS-II messages may be exchanged and active. Capabilities available to the host are similar to those available from the operator console wherever practical. The equipment may go ON-LINE only when the Communication State is COMMUNICATING.

---

## LOCAL

Operation of the equipment is implemented by direct action of an operator. All operation commands are available for input at the local operator console of the equipment.

The host has the following capabilities and restrictions when the LOCAL State is active:

- During processing, the host may be prohibited from modifying equipment constants that affect that process. Other equipment constants are changeable during processing. The host may modify all available equipment constants when no processing is in progress.
- The host is prohibited from the use of any remote command that causes motion or adversely affects processing.
- The host may initiate the upload and download of recipes to or from the recipe storage area on the equipment unless it affects the current recipe during processing.
- The host may configure automatic data reporting capabilities including alarms, event reporting, and trace data reporting. The host receives all such reports at the appropriate times.
- The host may inquire for data from the equipment, including status data, equipment constants, event reports, process program directories, and alarms.
- The equipment may perform Terminal Services.

The host is allowed any other capabilities that were not specifically restricted in the above items as long as the LOCAL State is active.

Note: Capabilities mentioned above which are not implemented on specific equipment may be ignored in this context.

---

## REMOTE

While the REMOTE State is active, the host may operate the equipment through the communications interface. All functionality allowed during the LOCAL State is also allowed in the REMOTE State. The equipment does not restrict any host capabilities when REMOTE is active. The host may issue remote commands according to each command's availability. No capabilities that are available to the operator during LOCAL control are unconditionally restricted when the REMOTE State is active. Control is shared between the host and the local operator

#### 9. CONTROL STATE TRANSITION TABLE

#	Current State	Trigger	New State	Action	Comments
1	(Undefined)	Entry into CONTROL state (system initialization)	CONTROL (Substate conditional on configuration).	None	Equipment may be configured to default to ON-LINE or OFF-LINE*.
2	(Undefined)	Entry into OFF_LINE state	OFF_LINE (Substate conditional on configuration).	None	Equipment may be configured to default to any substate of OFF-LINE.
3	EQUIPMEN OFF-LINE	Operator actuates ON-LINE switch.	ATTEMPT ON-LINE	None	Note that an S1, F1 is sent whenever ATTEMPT ON-LINE is activated.
4	ATTEMPT ON-LINE	S1, F0	New state conditional on configuration.	None	This may be due to a communication failure, ** reply timeout, or receipt of S1, F0. Configuration may be set to EQUIPMENT OFF-LINE or HOST OFF-LINE.
5	ATTEMPT ON-LINE	Equipment receives expected S1, F2 message from the host.	ON-LINE	None	Host is notified of transition to ON-LINE at transition 7.
6	ON-LINE	Operator actuates OFF-LINE switch.	EQUIPMENT OFF-LINE	None	"Equipment OFF-LINE" event occurs***. Event reply will be discarded while OFF-LINE is active.
7	(Undefined)	Entry on ON_LINE state	ON-LINE (LOCAL)	None	"Control State LOCAL"
8	LOCAL	Operator selects Remote Mode	REMOTE	None	"Control State REMOTE"
9	REMOTE	Operator selects Local Mode	LOCAL	None	"Control State LOCAL"
10	ON-LINE	Equipment accepts "Set OFF-LINE" message from host (S1, F15).	HOST OFF-LINE	None	"Equipment OFF-LINE" event occurs.
11	HOST OFF-LINE	Equipment accepts host request to go ON-LINE (S1, F17).	ON-LINE	None	Host is notified to transition to ON-LINE at transition 7.
12	HOST OFF-LINE	Operator actuates OFF-LINE switch.	EQUIPMENT OFF-LINE	None	"Equipment OFF-LINE" event occurs.

---

## 10. RELATED VARIABLES, CONSTANTS AND EVENTS

For complete descriptions, refer to the Appendix.

Name	Type
ControlState	Status Variable
CtrlStateSwitch	Status Variable
CtrlOnlineSwitch	Status Variable
DefCtrlOfflineState	Equipment Constant
DefaultCtrlState	Equipment Constant
ControlStateLocal	Collection Event
ControlStateRemote	Collection Event
EquipmentOffline	Collection Event

## EQUIPMENT PROCESSING STATE MODEL

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### 11. GENERAL DESCRIPTION

The Equipment Processing State Model defines the operation of the machine. Because operation varies between machines, the GEM standard does not define a specific model.

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### 12. EQUIPMENT PROCESSING STATE DIAGRAM



## 13. EQUIPMENT PROCESSING STATE DEFINITIONS

### INIT

Initialization is occurring

### INIT WITH ALARMS

An alarm occurred during initialization

### IDLE

In this state, the equipment is awaiting instructions. There is no process program selected and no lot open.

### PROCESS ACTIVE

This state is the parent of all substates where the context of process program execution exists and a lot is open.

### PROCESS

This state is the parent of those substates that refer to the active preparation and execution of a process program.

### SETTING UP

In this state the equipment is preparing or being prepared to enter the READY state.

### READY

In this state the equipment is ready for process execution and is awaiting a START command from the operator or the host.

### EXECUTING

This state refers to the executing of a process program automatically and can continue to do so without external intervention.

### PAUSE

This state is the parent of those substates that refer to the suspension of execution and waiting for a command either from an alarm or pause event

### PROCESS PAUSE

This state is the parent of those substates that refer to the suspension of execution and the resumption of processing.

### PAUSED

In this state the equipment PROCESS state has been suspended

### CHECKING

In this state the process program is checked for validity, if the process program has not changed then this state is a pass-through state

### ALARM PAUSED

In this state the PROCESS state has been suspended because of an alarm condition

### STOPPING

In this state the equipment is acting upon a STOP command

### ABORTING

In this state the equipment is acting upon an ABORT command

### ABORTED

In this state the equipment has aborted processing

## 14. EQUIPMENT PROCESSING STATE TRANSITION TABLE

#	Current State	Trigger	New State	Action	Event
---	---------------	---------	-----------	--------	-------

1	INIT	Equipment initialization complete	IDLE	None	504
2	IDLE	Process program is downloaded and selected	SETTING UP	Equipment prepares and /or is prepared to receive START command	508
3	SETTING UP	All activities need to start a process program have been completed	READY	Wait for Start command	507
4	READY	Equipment has received a START command from the host or operator console.	EXECUTING	Equipment starts executing	511
5	EXECUTING	Equipment has finished lot of wafers	READY	Last wafer is unloaded and wafer cassette elevator is moved to PGV access point – OR – The Local User chooses to close job and current wafer is unloaded	507
6	PROCESS	Equipment has received a PAUSE command from host or operator console, or a PAUSE EVENT has occurred	PAUSED	Equipment pauses and waits for RESUME	506
7	PAUSED	Equipment has received a RESUME command from host or operator console	CHECKING	EQUIPMENT determines if the Process Program has been changed and starts validation process if it has	513
8	CHECKING	Equipment has validated any changes made to the Process Program or falls through if no changes made	PROCESS	Equipment resumes operation	507,508 or 511
9	CHECKING	Equipment has failed to validated changes made to the Process Program	PAUSED	Equipment displays warning	506
10	PROCESS	An alarm occurs	ALARM PAUSED	Equipment displays alarm status	509
11	ALARM PAUSED	Alarm is cleared	PAUSED	Equipment waits for RESUME command	506
12	PROCESS PAUSE	An alarm occurs after RESUME command	ALARM PAUSED	Equipment displays alarm status	509



13	PAUSE	Equipment receives a STOP command	STOPPING	Equipment executes the STOP sequence	512
14	PAUSE	Equipment receives an ABORT command	ABORTING	Equipment aborts operation as soon as possible	510
15	ABORTING	Equipment has completed the ABORT command	ABORTED	Equipment displays ABORT data	503
16	ABORTED	ABORT state is cleared	IDLE	Equipment waits for next Process Program to execute	504
17	STOPPING	Equipment receives an ABORT command	ABORTING	Equipment aborts operation as soon as possible	510
18	STOPPING	Equipment has completed the STOP command	IDLE	Equipment waits for next Process Program to execute	504
19	INIT	Failed to initialize	INIT WITH ALARMS	Display alarm and wait for alarm to be cleared	505
20	INIT WITH ALARMS	Alarm cleared	INIT	Wait for initialization to be performed	514
21	PROCESS	Equipment receives an ABORT command	ABORTING	Equipment aborts operation as soon as possible	510
22	PROCESS	Equipment has received a STOP command from host or operator console.	STOPPING	Equipment executes the STOP sequence	512

## 15. RELATED VARIABLES, CONSTANTS AND EVENTS

For complete descriptions, refer to the Appendix.

Name	Type
ProcessStateString	Status Variable
PREVIOUSPROCESSSTATE	Status Variable
ProcessState	Status Variable


## 16. PROCESSING STATE MODEL EVENTS

Below are the events and functions associated with the Processing State model.

Event CEID	Name	Description
11	ProcessingStateChange	Generic event triggered when the processing state changes ( only is triggered if there is no unique event assigned to the state transition )
503	ProcessingState_Aborted	Event triggered when the Tool transitions from ABORTING to ABORTED as the result of an ABORT command
504	ProcessingState_IDLE	Event triggered when Tool transitions to the IDLE state
505	ProcessingState_INITALARMS	Event triggered when the Tool transitions from INIT to INITWITH ALARMS IDLE as the result of a problem during initialization
506	ProcessingState_PAUSED	Event triggered when Tool transitions to the PAUSED state
507	ProcessingState_READY	Event triggered when Tool transitions to the READY state
508	ProcessingState_SETTING_UP	Event triggered when Tool transitions to the SETTING UP state as the result of a PP_SELECT command
509	ProcessingState_ALARMPAUSED	Event triggered when Tool transitions to the ALARMPAUSED state as the result of an alarm
510	ProcessingState_ABORTING	Event triggered when Tool transitions to the ABORTING state as a result of receiving an ABORT command
511	ProcessingState_EXECUTING	Event triggered when a wafer/tray is ready to be processed
512	ProcessingState_STOPPING	Event triggered when Tool transitions to the STOPPING state as a result of receiving a STOP command
513	ProcessingState_CHECKING	Event triggered when Tool transitions to the CHECKING state as a result of receiving a RESUME command
514	ProcessingState_INIT	Event triggered when Tool transitions to the INIT state

### EVENT 503 – PROCESSINGSTATE\_ABORTED

Below is the list of status variables associated with the collection event triggered by the blank processing state change.

VID	Name	Description
2032	ProcessStateString	Additional Information
2030	PreviousProcessState	Processing State transitioned from
2031	ProcessState	Processing State transitioned to

### EVENT 504 – PROCESSINGSTATE\_IDLE

Below is the list of status variables associated with the collection event triggered by the blank processing state change.

VID	Name	Description
2032	ProcessStateString	Additional Information
2030	PreviousProcessState	Processing State transitioned from
2031	ProcessState	Processing State transitioned to

### EVENT 505 – PROCESSINGSTATE\_INITALARMS

Below is the list of status variables associated with the collection event triggered by the blank processing state change.

VID	Name	Description
2032	ProcessStateString	Additional Information
2030	PreviousProcessState	Processing State transitioned from
2031	ProcessState	Processing State transitioned to

### EVENT 506 – PROCESSINGSTATE\_PAUSED

Below is the list of status variables associated with the collection event triggered by the blank processing state change.

VID	Name	Description
2032	ProcessStateString	Additional Information
2030	PreviousProcessState	Processing State transitioned from
2031	ProcessState	Processing State transitioned to

## EVENT 507 – PROCESSINGSTATE\_READY

Below is the list of status variables associated with the collection event triggered by the blank processing state change.

VID	Name	Description
2032	ProcessStateString	Additional Information
2030	PreviousProcessState	Processing State transitioned from
2031	ProcessState	Processing State transitioned to

## EVENT 508 – PROCESSINGSTATE\_SETTING\_UP

Below is the list of status variables associated with the collection event triggered by the blank processing state change.

VID	Name	Description
2032	ProcessStateString	Additional Information
2030	PreviousProcessState	Processing State transitioned from
2031	ProcessState	Processing State transitioned to

## EVENT 509 – PROCESSINGSTATE\_ALARMPAUSED

Below is the list of status variables associated with the collection event triggered by the blank processing state change.

VID	Name	Description
2032	ProcessStateString	Additional Information
2030	PreviousProcessState	Processing State transitioned from
2031	ProcessState	Processing State transitioned to

## EVENT 510 – PROCESSINGSTATE\_ABORTING

Below is the list of status variables associated with the collection event triggered by the blank processing state change.

VID	Name	Description
2032	ProcessStateString	Additional Information
2030	PreviousProcessState	Processing State transitioned from
2031	ProcessState	Processing State transitioned to

## EVENT 511 – PROCESSINGSTATE\_EXECUTING

Below is the list of status variables associated with the collection event triggered by the blank processing state change.

VID	Name	Description
2032	ProcessStateString	Additional Information
2030	PreviousProcessState	Processing State transitioned from
2031	ProcessState	Processing State transitioned to

## EVENT 512 – PROCESSINGSTATE\_STOPPING

Below is the list of status variables associated with the collection event triggered by the blank processing state change.

VID	Name	Description
2032	ProcessStateString	Additional Information
2030	PreviousProcessState	Processing State transitioned from
2031	ProcessState	Processing State transitioned to

## EVENT 513 – PROCESSINGSTATE\_CHECKING

Below is the list of status variables associated with the collection event triggered by the blank processing state change.

VID	Name	Description
2032	ProcessStateString	Additional Information
2030	PreviousProcessState	Processing State transitioned from
2031	ProcessState	Processing State transitioned to

## EVENT 514 – PROCESSINGSTATE\_INIT

Below is the list of status variables associated with the collection event triggered by the blank processing state change.

VID	Name	Description
2032	ProcessStateString	Additional Information
2030	PreviousProcessState	Processing State transitioned from
2031	ProcessState	Processing State transitioned to

## ALARM STATE MODEL

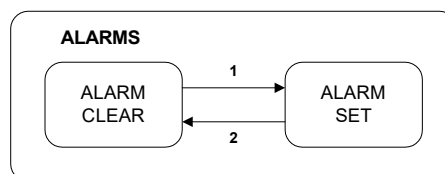
### 17. GENERAL DESCRIPTION

The alarm management capability provides for host notification and management of alarm conditions occurring on the equipment. This alarm management provides several useful tools.

- Reporting the time of an alarm state change.
- Uploading a list of alarm texts.
- Enabling and disabling the notification of specific alarms.
- Host query of alarms set and enabled status on the equipment.

An alarm is related to any abnormal situation on the equipment that may endanger people, equipment, or material being processed. Such abnormal situations are defined by the equipment manufacturer based on physical safety limitations. Equipment activities potentially impacted by the presence of an alarm are inhibited. Note that exceeding control limits associated with process tolerance do not constitute an alarm nor do normal equipment events such as the start or completion of processing.

### 18. ALARMS STATE DIAGRAM



## 19. ALARMS STATE DEFINITIONS

### ALARM CLEAR

The alarm is inactive. The situation is normal or safe.

### ALARM SET

The alarm is active. The situation is abnormal or unsafe.

## 20. ALARMS STATE TRANSITION TABLE

#	Current	Trigger	New State	Action	Comment
1	ALARM <sub>n</sub> CLEAR	ALARM <sub>n</sub> is detected on the equipment.	ALARM <sub>n</sub> SET	Initiate local actions (if any) to ensure safety. Update "AlarmsSet and ALCD <sub>n</sub> values." Generate and issue alarm message if enabled.	Inhibited activities require operator or host intervention prior to resuming.
2	ALARM <sub>n</sub> SET	ALARM <sub>n</sub> is no longer detected on the equipment.	ALARM <sub>n</sub> CLEAR	Update AlarmsSet and ALCD <sub>n</sub> values. Generate and issue alarm message if enabled.	Inhibited activities require operator or host intervention prior to resuming.

## 21. RELATED VARIABLES, CONSTANTS AND EVENTS

For complete descriptions, refer to the Appendix.

Name	Type
Aser	Status Variable
AlarmState	Status Variable
AlarmsEnabled	Status Variable
AlarmsSet	Status Variable
AlarmID	Data Variable

## MACHINE CAPABILITIES

### ESTABLISH COMMUNICATIONS

#### 22. PURPOSE

Communications between host and equipment are formally established through use of the Establish Communications Request/Establish Communications Acknowledge transaction, S1, F13/F14.

#### 23. DESCRIPTION

There are potential problems when one side of the communications link fails and the other side does not detect it. From the point of view of the host, a loss of communications has many possible causes. In some cases, host-controlled settings on the equipment may need to be reset. In other cases, the equipment may have continued an automatic processing sequence during the period of no communication and may have changed states.

The equipment considers communications as formally established whenever either of the following conditions has been satisfied. Satisfaction of either of these conditions will result in a transition to the COMMUNICATING substate. See the Communications State Model for further detail.

- Communications Request has been sent to the host and an Establish Communications Acknowledge has been received within the transaction timeout period and with an acknowledge code of “Accept”, or
- Communications Request has been received from the host, and an Establish Communications Acknowledge response has been successfully sent with an acknowledge code of “Accept.”

When the equipment is attempting to establish communications, an Establish Communications Request is sent periodically until communications have been formally established as described above. The interval between attempts is user-configurable and begins as soon as a connection transaction failure is detected (see [Communications State Model](#) ).

Attempting to establish communications is not a low-level connectivity issue, but rather a logical application issue used by either party to notify its partner that the host may need to perform synchronization activities with the equipment.

## 24. SCENARIOS

### HOST ATTEMPTS TO ESTABLISH COMMUNICATIONS

COMMENT	HOST	EQUIPMENT	COMMENT
Establish Communications	S1, F13 →		
			Communications state is enabled (any substate)
		← S1, F14	Reply COMMACK = Accept and Communications state = COMMUNICATING



# EQUIPMENT ATTEMPTS TO ESTABLISH COMMUNICATIONS AND HOST ACKNOWLEDGES

COMMENT	HOST	EQUIPMENT	COMMENT
			Communications State = NOT COMMUNICATING
		← S1, F13	[LOOP] [LOOP] – SEND Establish Communications Request
Establish Communications Acknowledge	S1, F14 →		[IF] S1, F14 received without timeouts [THEN] exit loop – SEND [ELSE] Delay for interval in EstablishCommunicationsTimeout [ENDIF] [END_LOOP]–SEND [IF] COMMACK = Accept [THEN] Communications state = Communicating exit loop – [ELSE] Reset timer for delay, and delay for interval specified in EstablishCommunicationsTimeout [ENDIF] [END_LOOP]

## SIMULTANEOUS ATTEMPTS TO ESTABLISH COMMUNICATIONS

For equipment that supports interleaving, it is possible that either the host or equipment could send an Establish Communications Request before receiving the request from its partner. As communications are established by the successful acceptance of any one Establish Communications Request, it is immaterial who sends the request first. The roles of host and equipment may be reversed.

### EQUIPMENT RECEIVES S1, F14 FROM HOST BEFORE SENDING S1, F14

COMMENT	HOST	EQUIPMENT	COMMENT
			Communications State = NOT COMMUNICATING
		← S1, F13	Establish Communications Request
Establish Communications Request	S1, F13 →		
Reply COMMACK = Accept	S1, F14 →		S1, F14 received from Host and Communications established* and Communications state = COMMUNICATING
		← S1, F14	Reply COMMACK = Accept**

### EQUIPMENT SENDS S1, F14 TO HOST BEFORE RECEIVING S1, F14

COMMENT	HOST	EQUIPMENT	COMMENT
			Communications State = NOT COMMUNICATING
		← S1, F13	Establish Communications Request
Establish Communications Request	S1, F13 →		
		← S1, F14	Reply COMMACK = Accept* Communications established** and Communications state = COMMUNICATING
Reply COMMACK = Accept	S1, F14 →		S1, F14 received from Host

Communications are established at the successful completion of the S1, F13/F14 transaction where COMMACK is set to zero.

\*\* Communications are established on the successful transmission of S1, F14, even if there is an open S1, F13.

## DATA COLLECTION

### 25. PURPOSE

This capability allows the host to query for the equipment variables and is useful during initialization and synchronization.

### 26. DETAILED DESCRIPTION

The host may request a report containing data variables from the equipment by specifying the RPTID. It is assumed that the report has been previously defined (e.g. using the Define Report S2, F33 transaction; [S2, F33 Define Report \(HI\)](#)). The values of any status variables (SV) and equipment constants (EC) contained within the report must be current. Discrete data values (DV) are only guaranteed to be valid upon the occurrence of a specific collection event.

### 27. SCENARIOS

#### HOST REQUESTS REPORT

COMMENT	HOST	EQUIPMENT	COMMENT
Host requests data variables contained in report RPTID	S6, F19 <input type="checkbox"/>		
		<input type="checkbox"/> S6, F20	Equipment responds with list of variable data for the given RPTID.

### 28. DYNAMIC EVENT REPORT CONFIGURATION

#### PURPOSE

This capability provides the data reporting flexibility required in some manufacturing environments. It allows the host to increase or decrease the data flow according to need. For example, if the performance of the equipment degrades, the data flow from that equipment may be increased to help diagnose the problem.

#### DETAILED DESCRIPTION

The equipment supports the following event report configuration functionality through the SECS-II interface:

- Host definition/deletion of custom reports,
- Host linking/unlinking of defined reports to specified collection events, and
- Host enabling/disabling the reporting of specified collection events.

Note: The equipment may also supply alternative means for defining reports and linking reports to events (e.g. via the operator console). Implementation of alternate means is not required.

The equipment can be instructed by the host to enable or disable reporting of collection events on an individual or collective basis. A status variable – EventsEnabled (SVID = 2029) is available that consists of a list of enabled collection events.

Reports may be attached to an event report message (S6, F11). These reports are linked to the desired collection event. They typically contain variables relating to that event. The reported data in the event report messages might include status variables (SV), equipment constants (EC), or data variables (DV). Note that data variable values are only valid upon certain events and should be included only in reports linked to those events.

## SCENARIOS

### COLLECTION EVENT REPORTING SET-UP

COMMENT	HOST	EQUIPMENT	COMMENT
Send report definitions	S2, F33 →		DATAID, RPTID and VID received
		← S2, F34	DRACK* = 0 the reports are OK
Link reports to events	S2, F35 →		CEID and the corresponding RPTID are received
		← S2, F36	LRACK = 0 the event linkages are acceptable.
Enable specific collection events	S2, F37 →		Enable/disable codes (CEED) and the respective event reporting CEID received.
		← S2, F38	ERACK = 0 OK, will generate the specified reports when the appropriate collection events happen.

## 29. TRACE DATA COLLECTION

### PURPOSE

Trace data collection provides a method of sampling data on a periodic basis. The time-based approach to data collection is useful in tracking trends or repeated applications within a time window, or monitoring of continuous data.

### DETAILED DESCRIPTION

The equipment establishes a trace report as instructed by the host (S2, F23). For a trace report (S6, F1) the host designates the following:

- Trace report identifier (TRID)
- Time interval for data sampling (DSPEP)
- Total number of samples to be taken (TOTSMP)
- Number of samples per trace report (REPGSZ)
- Listing of which data will be sent with the report

The number of trace reports sent to the host is determined by total samples, divided by reporting group size (TOTSMP/REPGSZ).

The equipment samples the specified data at the interval designated by the host (DSPEP) and sends a predefined trace report to the host for the specified reporting group size (REPGSZ). The trace report definition is automatically deleted from the equipment after the last trace report has been sent.

The host may modify or re-initiate a trace function currently in progress by specifying the same TRID in a trace request definition. At this point, the old trace is terminated and the new trace is initiated. The host may also instruct the equipment to terminate a trace report prior to its completion by specifying TOTSMP = 0 for that TRID, at which point the trace definition is deleted.

## SCENARIOS

### HOST INITIATES TRACE REPORT

COMMENT	HOST	EQUIPMENT	COMMENT
Trace Data initialization requested	S2, F23 <input type="checkbox"/>		
		<input type="checkbox"/> S2, F24	Acknowledge, trace initiated [DO] TOTSMP REPGSZ times [DO] REPGSZ many times: collect SVID <sub>1</sub> ...SVID <sub>n</sub> data, delay time by DSPER. [END DO]
		<input type="checkbox"/> S6, F1	Send SV <sub>1</sub> ,...SV <sub>n</sub>
Acknowledge receipt	S6, F2 <input type="checkbox"/>		[END DO]
Optional: Request trace termination prior to completion (TOTSMP = 0)	S2, F23 <input type="checkbox"/>		
		<input type="checkbox"/> S2, F24	Acknowledge premature termination

### 30. STATUS DATA COLLECTION

#### PURPOSE

This capability allows the host to query the equipment for selected status information and is useful in synchronizing with equipment status.

#### DETAILED DESCRIPTION

The host may query equipment status by specifying the desired SVID. Upon such a request, the equipment sends the host the value of the selected status variables. The host also may request the description (name and units) of any or all status variables.

## SCENARIOS

### REQUEST EQUIPMENT STATUS REPORT

COMMENT	HOST	EQUIPMENT	COMMENT
Host requests report of selected status variable values.	S1, F3 →		
		← S1, F4	Equipment responds with the requested status variable data.

### REQUEST EQUIPMENT STATUS VARIABLE NAMELIST

COMMENT	HOST	EQUIPMENT	COMMENT
Host requests equipment to identify selected status variables.	S1, F11 →		
		← S1, F12	Equipment responds with the requested status variable descriptions.

## ALARM MANAGEMENT

### 31. GENERAL DESCRIPTION

The alarm management capability provides for host notification and management of alarm conditions occurring on the equipment. This alarm management provides several useful tools.

- Reporting the time of an alarm state change.
- Uploading a list of alarm texts.
- Enabling and disabling the notification of specific alarms.
- Host query of alarms set and enabled status on the equipment.

An alarm is related to any abnormal situation on the equipment that may endanger people, equipment, or material being processed. Such abnormal situations are defined by the equipment manufacturer based on physical safety limitations. Equipment activities potentially impacted by the presence of an alarm are inhibited. Note that exceeding control limits associated with process tolerance do not constitute an alarm nor do normal equipment events such as the start or completion of processing.

### 32. SCENARIOS

Note: Consult event-reporting sections of this document for descriptions of enabling, disabling, and sending collection event reports.

#### ENABLE/DISABLE ALARMS

COMMENT	HOST	EQUIPMENT	COMMENT
Enable/Disable Alarm	S5, F3 →		
		← S5, F4	Acknowledge

#### SEND ALARM REPORT

Alarm occurrence detected by the equipment

COMMENT	HOST	EQUIPMENT	COMMENT
		← S5, F1	Send alarm report (if enabled)
Acknowledge	S5, F2 →		
		← S6, F11	Send event report (if enabled)
Acknowledge	S6, F12 →		

## REMOTE COMMANDS

### 33. PURPOSE

Remote Control capability provides the host control over certain equipment operations.

### 34. DESCRIPTION

The equipment responds to host commands that provide the following functions relative to individual equipment implementations:





•	•
JobCreate	Machine Receives multiple S2F49 JobCreate commands, adds them all to a queue

Remote commands are “request action be initiated” rather than “do action.” The equipment may then respond via S2F49 with HCACK = 4 if the command “is going to be performed.” This alleviates any transaction timeouts for commands that may take a long time to perform. The completion of the action initiated by the remote command (i.e., HCACK = 0 or 4) must result in either a state transition or other action that generates a collection event upon normal/abnormal completion. If the command is rejected the equipment will respond with HCACK=2 – Command cannot be performed.

The format for all remote commands is ASCII, with a maximum length of 20 characters. The character set is restricted to the printable characters (hexadecimal 21 through 7E). Note that spaces are not allowed.

## HOST SENDS A REMOTE COMMAND

COMMENT

Host Command Send	S2, F49 		
		 S2, F50	Host Command Acknowledge
		 S6, F11	<p>[IF] Command Accepted (HACK = 4)</p> <p>[THEN] State change or other collection event occurrence</p> <p>[ELSE] Command Rejected (HACK = 2)</p> <p>Cannot perform command now ( due to command not supported for current processing state )</p>
Event Report Acknowledge	S6, F12 		



## EQUIPMENT CONSTANTS

### 36. PURPOSE

This capability provides a method for the host to read and to change the value of selected equipment constants on the equipment.

### 37. DESCRIPTION

This capability allows the host to reconfigure equipment constants to support a variety of situations. Note that when the host changes an equipment constant's value, the new value is not required to take effect immediately, although the equipment accepts the new value.

### 38. SCENARIOS

#### HOST SENDS EQUIPMENT CONSTANTS

Allow the host to change the value of one or more equipment constants.

COMMENT	HOST	EQUIPMENT	COMMENT
Host sends equipment constants	S2, F15 →		
		← S2, F16	EAC = 0 equipment sets constants

#### HOST EQUIPMENT CONSTANTS REQUEST

Allow the host to determine the current value of equipment constants.

COMMENT	HOST	EQUIPMENT	COMMENT
Host constant request	S2, F13 →		
		← S2, F14	Equipment constant data (NOTE: This capability also can be accomplished using S2, F19 and S6, F20.

#### HOST EQUIPMENT CONSTANT NAMELIST REQUEST

Allow the host to retrieve basic information about the equipment constants available at the equipment.

COMMENT	HOST	EQUIPMENT	COMMENT
Host constant namelist Request	S2, F29 →		
		← S2, F30	Equipment constant namelist

#### OPERATOR CHANGES EQUIPMENT CONSTANT

COMMENT	HOST	EQUIPMENT	COMMENT
			Operator changes equipment constant at equipment operator console.
		← S6, F11	Equipment reports equipment constant change.
Host acknowledges event	S6, F12 →		

## PROCESS RECIPE MANAGEMENT

### 39. PURPOSE

Process program management provides a means to transfer process programs and to share the management of those process programs between the host and equipment.

### 40. DESCRIPTION

A process program is the pre-planned and reusable set of instructions, settings, and parameters that determine the processing environment seen by the manufactured object.

Process programs allow the equipment's process, and/or the parameters used by that process, to be set and modified by the engineer to achieve different results. Different process programs may be required for different products, while often the same process program will be used for all lots of a given product. The engineer must be able to create such programs, to modify current programs, and to delete programs from equipment storage.

For the host to ensure that the proper process programs are on the equipment there must be a means of transferring them from equipment to host and from host to equipment. The host also may need to delete process programs from the equipment's storage to make room for a process program to be downloaded. In addition, the host must be kept informed whenever a local change occurs in the contents or status of a process program.

Unformatted process programs may be uploaded and downloaded. This capability provides for both host- and equipment-initiated transfers. The equipment-initiated transfer may be used at the request of the process engineer or operator of the equipment. If a process program exists with the same PPID as the one given in the SECS-II message, the old process program must be replaced. The PPID in the SECS-II message is used to identify the process program in non-volatile storage.

The equipment may deny overwriting or deleting a recipe if it is in use or affects the recipe in use.

### 41. SCENARIOS

#### PROGRAM CREATED, EDITED OR DELETED BY OPERATOR

COMMENT	HOST	EQUIPMENT	COMMENT
			New process program created, edited or deleted by operator of equipment. PPChangeName = PPID PPChangeStatus = 1 (Created) = 2 (Edited) = 3 (Deleted)
			[IF] CEID for Process Program Change Event enabled [THEN]
		← S6, F11	Send Event Report
Event Report Acknowledge	S6, F12 →		

#### PROCESS PROGRAM DELETION BY HOST

COMMENT	HOST	EQUIPMENT	COMMENT
Delete Process Program Send	S7, F17 →		
		← S7, F18	The process program is removed from non-volatile storage. Delete

			Process Program Acknowledge. Acknowledge ( ACKC7) 0 = Accepted 1 = Permission not granted 2 = Length error 3 = Matrix overflow 4 = PPID not found 5 = Mode unsupported 6-63 Reserved
[IF] ACKC7 = ACCEPTED (0)			
[THEN]			
			PPID will be deleted
[END_IF]			

## PROCESS PROGRAM DIRECTORY REQUEST

COMMENT	HOST	EQUIPMENT	COMMENT
Current EPPD Request	S7, F19 →		
		← S7, F20	Current EPPD Data

## HOST-INITIATED PROCESS PROGRAM UPLOAD – UNFORMATTED

COMMENT	HOST	EQUIPMENT	COMMENT
Process Program Request	S7, F5 →		
		← S7, F6*	Process Program Data *If the process program does not exist, a zero-length list will be sent.

## EQUIPMENT-INITIATED PROCESS PROGRAM UPLOAD – UNFORMATTED.

COMMENT	HOST	EQUIPMENT	COMMENT
			[IF] Process program is multi-block [THEN]
		← S7, F1	Process Program Load Inquire
Process Program Load Grant	S7, F2 →		
			[END_IF]
		← S7, F3	Process Program Send
Process Program Acknowledge	S7, F4 →		

## HOST-INITIATED PROCESS PROGRAM DOWNLOAD – UNFORMATTED

COMMENT	HOST	EQUIPMENT	COMMENT
[IF] Process program is multi-block [THEN]			
Process Program Load Inquire	S7, F1* →		
		← S7, F2	Process Program Load Grant * S7, F1 should be used only to request permission to transfer a multi-block formatted or unformatted process program. It should not be used to select a process program for execution; the remote command PP_SELECT should be used.
[END_IF]			
Process Program Send	S7, F3 →		
		← S7, F4	Process Program Acknowledge (ACKC7) 0 = Accepted 1 = Permission not granted 2 = Length error 3 = Matrix overflow 4 = PPID not found 5 = Mode unsupported 6-63 Reserved
[IF] ACKC7 = ACCEPTED (0) [THEN]			
		← S6, F11	Recipe Validation Event
EVENT REPORT ACKNOWLEDGE	S6F12→		
[END_IF]			

## EQUIPMENT-INITIATED PROCESS PROGRAM DOWNLOAD – UNFORMATTED

COMMENT	HOST	EQUIPMENT	COMMENT
		← S7, F5	Process Program Request
Process Program Send	S7, F6 →		
		← S6, F11	Recipe Download Validation Event
EVENT REPORT ACKNOWLEDGE	S6F12→		

## EQUIPMENT TERMINAL SERVICES

### 42. PURPOSE

Equipment Terminal Services allows the factory operators to exchange information with the host from their equipment workstations.

### 43. DETAILED DESCRIPTION

The equipment is capable of displaying information passed to it by the host for the operator's attention. The equipment has no responsibility for interpreting any of the data passed to or from the host using this method.

### 44. SCENARIOS

#### HOST SENDS INFORMATION TO AN EQUIPMENT'S DISPLAY DEVICE AND THEN OVERWRITES THE INFORMATION BEFORE OPERATOR RECOGNIZES MESSAGE

COMMENT	HOST	EQUIPMENT	COMMENT
Host sends textual information to equipment for display to the operator on terminal x.	S10, F3 →		
		← S10, F4	Equipment acknowledges request to display text (equipment sets unrecognized message indicator).

## CONTROL

### 45. PURPOSE

This section complements the Control State Model description ( [Control State Model](#) ). It defines the requirements for implementation of this model.

### 46. DESCRIPTION CONTROL CONFIGURATION

The control state model has two areas of configuration. The first area is related to the default entry states of the state model. Upon system initialization, the system must activate either the ON-LINE or the OFF-LINE state. Upon entry to OFF-LINE, the system must in turn activate one of the substates of OFF-LINE (EQUIPMENT OFF-LINE, ATTEMPT ON-LINE, or HOST OFF-LINE). In both these cases, the user configures the equipment to make the choices appropriate to that factory. Entry to the ON-LINE state also involves a choice of substates. In this case, the equipment reads the front panel REMOTE/LOCAL switch to determine the appropriate state.

The second area of configuration involves the transition to be made if the ON-LINE attempt should fail. The model may be set to transition to either HOST OFF-LINE or to EQUIPMENT OFF-LINE should the S1, F1 transaction be terminated unsuccessfully. Choosing HOST OFF-LINE allows the host to cause the equipment to transition to ON-LINE when the host becomes ready. This is accomplished via the message S1, F17 (see below).

#### 1.1.46.1 CHANGING CONTROL STATE

In the control state model, both the operator and the host can affect the control state. The operator retains ultimate authority to set the equipment OFF-LINE by means of an OFF-LINE switch mechanism. The operator also can cause the equipment to attempt to go ON-LINE. Under some circumstances, the host can initiate the transition to ON-LINE.

If the operator requests to go ON-LINE, the equipment will send an S1, F1 to the host. The host may confirm ON-LINE with an S1, F2 or deny ON-LINE by sending an S1, F0. If there is no host response (i.e., reply timeout), the equipment treats it as a denial.

When the equipment is ON-LINE, the host may request that it transition to OFF-LINE. It transitions to the HOST OFF-LINE substate. When the equipment HOST OFF-LINE state is active, the host may request that it transition to ON-LINE. The combination of these two allows the host to cycle the equipment between ON-LINE and OFF-LINE.

Only the operator may change the ON-LINE substate (REMOTE or LOCAL).

## 47. SCENARIOS

### HOST ACCEPTS ON-LINE

COMMENT	HOST	EQUIPMENT	COMMENT
			Operator actuates ON-LINE switch when equipment OFF_LINE state is active.
		⌘ S1, F1	Equipment request ON-LINE.
Host grants ON-LINE	S1, F2 ⌘		
		⌘ S6, F11	"Control State LOCAL (or REMOTE)" collection event.
Acknowledge	S6, F12 ⌘		

### HOST DENIES ON-LINE

COMMENT	HOST	EQUIPMENT	COMMENT
			Operator actuates ON-LINE switch when equipment OFF_LINE state is active.
		⌘ S1, F1	Equipment requests ON-LINE.
Host denies ON-LINE	S1, F0 ⌘		

### OPERATOR SETS OFF-LINE

COMMENT	HOST	EQUIPMENT	COMMENT
			Operator actuates OFF-LINE switch when equipment ON_LINE state is active.
		⌘ S6, F11	"Equipment request OFF-LINE" event.
Acknowledge	S6, F12 ⌘		

### OPERATOR SETS REMOTE

COMMENT	HOST	EQUIPMENT	COMMENT
			Operator sets switch from LOCAL to REMOTE.
		⌘ S6, F11	"Control State REMOTE" event.
Acknowledge	S6, F12 ⌘		

### OPERATOR SETS LOCAL

COMMENT	HOST	EQUIPMENT	COMMENT
			Operator sets switch from REMOTE to LOCAL.
		⌘ S6, F11	"Control State LOCAL" event.
Acknowledge	S6, F12 ⌘		

### HOST SETS OFF-LINE

COMMENT	HOST	EQUIPMENT	COMMENT
Host request OFF-LINE.	S1, F15 ⌘		
			[IF] Equipment is OFF-LINE
		⌘ S1, F0	[THEN] Equipment does not process requests.
			[ELSE] Equipment ON-LINE

		⌚ S1, F16	Equipment acknowledges request and transitions to OFF-LINE.
		⌚ S6, F11	"Equipment OFF_LINE" event.
Acknowledge	S6, F12 ⌚		
			[END_IF]



## HOST SETS ON-LINE

COMMENT	HOST	EQUIPMENT	COMMENT
Host requests ON-LINE	S1, F17 □		
			[IF] Equipment is HOST OFF-LINE state not active.
		▣ S1, F18	[THEN] Equipment denies request (ONLACK = 0).
			[ELSE] Equipment HOST OFF-LINE state is active.
		▣ S1, F18	Equipment acknowledges request (ONLACK = 0).
		▣ S6, F11	“Control state LOCAL (or REMOTE)” event.
Acknowledge	S6, F12 ▣		
			[END_IF]

## OPERATIONAL FLOW

### MATERIAL MOVEMENT – MOVE IN

#### PROCESS FLOW

##### 48. RECIPE

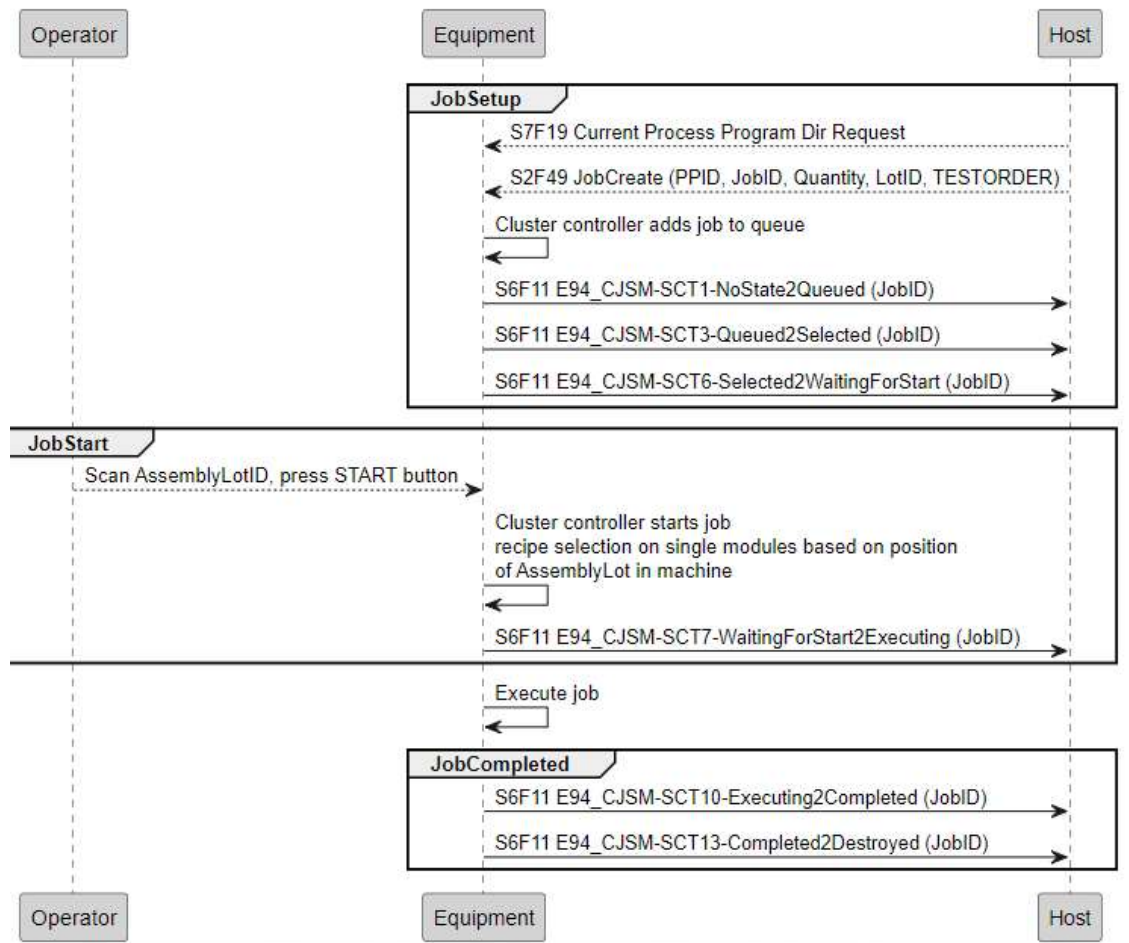
We have:

S7F19 Current Process Program Dir Request before starting the Job request sequence

The PPID to start is part of the Process Job request (see below)

##### 49. CREATE PROCESS JOB

Process Job is created with the S2F49 (EnhanceRemoteCommand) Request.



Example of parameters received for the S2F49 (Jop Creation)

S2F49 W-Bit=1 Device=0 SysBytes=0000000C

<L[2]

<A[9] "JobCreate">

<L[5]

<L[2]

<A[5] "JOBID">

<A[36] "RE149200TST\_064-50020220120132408515">

>

<L[2]

<A[8] "QUANTITY">

<A[4] "4000">

>

<L[2]

<A[4] "PPID">

<A[16] "M4954\_Testrecipe">

>

<L[2]

<A[13] "ASSEMBLYLOTID">

<A[8] "RE149200">

>

<L[2]

<A[9] "TESTORDER">

<L[32]

<A[1] "F">

<A[5] "BE3WX">

<A[8] "RE149200">

<A[7] "S\_Test1">

<A[4] "4000">

<A[10] "SACHNUMMER">

<A[9] "TEST-TAPE">

<A[8] "97010288">

<A[7] "S\_Test1">

<A[7] "0000000">

<A[4] "PROD">

<A[12] "PG-SSOM-2-11">

<A[4] "NULL">

<A[11] "M4954B00011">

<A[4] "NULL">

<A[4] "NULL">

<A[4] "NULL">

<A[0] "">

```
<A[32] "M4954_TLE4954_55_IBB_BE_Flex_RBG">  
<A[14] "M4954AX32BX241">  
<A[4] "2.41">  
<A[6] "Ins001">  
<A[2] "AT">  
<A[2] "25">  
<A[9] "TLE4954CB">  
<A[2] "28">  
<A[4] "99.5">  
<A[7] "DEFAULT">  
<A[3] "110">  
<A[4] "30.0">  
<A[0] "">  
<A[0] "">  
>  
>
```

---

## 50. START

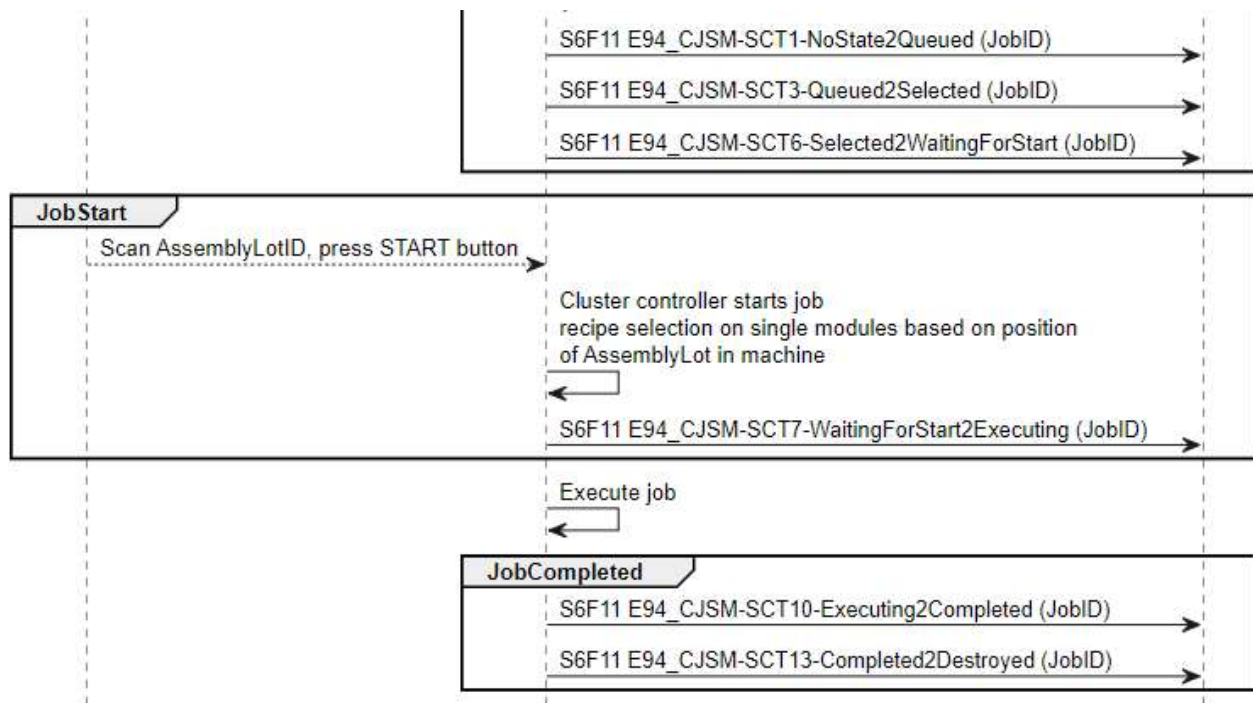
Machine Receives multiple S2F49 JobCreate commands, adds them all to a queue

Adding Jobs to the queue shall always be possible, Controlstate must be online/remote

Operator selects job to process by AssemblyLotID (Handheld scanner)

Operator presses START button to start processing of the job

## E94 related notifications during job processing



## MATERIAL MOVEMENT – MOVE OUT

### 51. MATERIAL PROCESSING COMPLETED

#### LGA\_Consume\_End Report

S6F11 LGA\_Consume\_End (This report shall be also available as file local stored on the machine PC and shown in operator GUI as soon as the S6F11 event is sent)

Event triggers:

- Machine stops consuming LGA Modules from LGA lot e.g. LGA lot fully consumed/empty
- Assembly Target Lot Size reached, LGA consume end

Send Collection event -> MaterialReport (8077)

Report content:

9088	MaterialReport_LotName
9089	MaterialReport_AssemblyLotID
9090	MaterialReport_MaterialId
9091	MaterialReport_MaterialConsumption
9092	MaterialReport_LGAREjects

### AssemblyLotFinished Report

S6F11 AssemblyLotFinished (This report shall be also available as file local stored on the machine PC and shown in operator GUI as soon as the S6F11 event is sent)

Fails from tester are added to one specific RejectLossCode (no additional loss if also bad AOI result)

TBD: AssemblyLotRejectLossCodes

Event trigger:

-Machine has finished production of current Assemblylot withing current Job

Send Collection event -> LotCompleted (8063)

Report content available Data in DV variables:

9077	LotCompleted_Name
9078	LotCompleted_Count
9079	LotCompleted_Product
9080	LotCompleted_BadCount
9081	LotCompleted_GoodCount
9082	LotCompleted_Yield
9083	LotCompleted_StartTime
9084	LotCompleted_EndTime
9085	LotCompleted_AssemblyLotID
9086	LotCompleted_AssemblyLotQty
9087	LotCompleted_AssemblyLotRejects

As LotCompleted\_AssemblyLotRejects has a variable content the data is in xml format with as many entries as provided by the machine:

Example:

```
<AssemblyLotRejects>
  <AssemblyLotRejectLossCode_1>93</AssemblyLotRejectLossCode_1>
  <AssemblyLotRejectLossQty_1>4</AssemblyLotRejectLossQty_1>
  <AssemblyLotRejectLossCode_2>149</AssemblyLotRejectLossCode_2>
  <AssemblyLotRejectLossQty_2>20</AssemblyLotRejectLossQty_2>
  <AssemblyLotRejectLossCode_3>148</AssemblyLotRejectLossCode_3>
  <AssemblyLotRejectLossQty_3>20</AssemblyLotRejectLossQty_3>
  ...
</AssemblyLotRejects>
```

</AssemblyLotRejects>

## SECS-II MESSAGE SUMMARY

### CONTROL STATE DEPENDENCY

The equipment's Control State Model, as described on page **Error! Bookmark not defined.**, determines the availability of most SECS-II message communication. If the host sends an unavailable SECS-II message while the equipment is off-line, then the equipment will respond with a respective Sx, F0 message.

Control State	Description
On-line L, R	On-line local or remote
Any	Any control state
Off-line	Off-line equipment, host or on-line Attempt. It may be accepted while on-line, but has no meaning.
On-line R	On-line remote

### HOST INITIATED

This section lists primary, host initiated SECS-II messages supported by the equipment.

Primary	Reply	Notes	Control State	Primary Description
S1, F1	S2, F2		On-line L, R	Are you there request
S1, F3	S1, F4		On-line L, R	Selected equipment status request
S1, F11	S1, F12		On-line L, R	Status variable name-list request
S1, F13	S1, F14		Any	Establish communication request
S2, F13	S2, F14		On-line L, R	Equipment constant request
S2, F15	S2, F16		On-line L, R	New equipment constant send
S2, F33	S2, F34		On-line L, R	Define report
S2, F35	S2, F36		On-line L, R	Link event report
S2, F37	S2, F38		On-line L, R	Enable/disable event report
S2, F39	S2, F40		On-line L, R	Multi-block inquire
S2, F41	S2, F42		On-line R	Host command send
S5, F3	S5, F4		On-line L, R	Enable/Disable Alarms
S5, F5	S5, F6		On-line L, R	List Alarm Request
S7, F1	S7, F2		On-line L, R	Process program load inquire
S7, F3	S7, F4		On-line L, R	Process program send
S7, F5	S7, F6		On-line L, R	Process program request
S7, F17	S7, F18		On-line L, R	Delete process program send
S7, F19	S7, F20		On-line L, R	Current EPPD request
S7, F23	S7, F24		On-line L, R	Formatted Process program send
S10, F3	S10, F4		On-line L, R	Terminal display, single



## EQUIPMENT INITIATED

This section lists primary, equipment initiated SECS-II messages supported by the equipment.

Primary	Reply	Notes	Primary Description
Sx, F0	none		Host primary reject since control state is off-line
S1, F1	S2, F2		Are you there request
S1, F13	S1, F14		Establish communication request
S5, F1	S5, F2	W5	Alarm report send
S6, F11	S6, F12	W6	Event report send
S7, F1	S7, F2		Process program load inquire
S7, F3	S7, F4		Process program send
S7, F5	S7, F6		Process program request
S7, F25	S7, F26		Formatted Process program request
S9, F1	none		Unrecognized device ID
S9, F3	none		Unrecognized stream type
S9, F5	none		Unrecognized function type
S9, F7	none		Illegal data
S9, F9	none		Transaction timer timeout
S9, F11	none		Data too long
S9, F13	none		Conversation timeout
S12F1	S12F2		Map Set-up Data Send
S12F3	S12F4		Map Set-up Data
S12F5	S12F6		Map Transmit Inquire/Grant
S12F9	S12F10		Map Data Send Type 2
S12F15	S12F16		Map Data Type 2
S14,F1	S14,F2		Request E142 map data

## STREAMS AND FUNCTIONS

The sections below describe the subset of SECS-II message streams and their included functions that are supported by the interface. It can be seen that the odd numbered functions within each stream are requests and the subsequent, even numbered functions are the corresponding response.

Symbol	Description
H↔E	Host to equipment or equipment to host
H←E	Equipment to host only
H→E	Host to equipment only

## STREAM 1: EQUIPMENT STATUS

### 52. S1, F1 ARE YOU THERE REQUEST (H↔E)

Function establishes that the SECS-II link is operational and that the host and machine are on-line. The machine responds with its model number and software revision. The host responds with a null list. The machine periodically sends this message as a "heartbeat" for the SECS-II communications link.

**Header only**

### 53. S1, F1 ON-LINE DATA (H←E)

**L, 2**

**1. <A MDLN>**

## 2. <A SOFTREV>

54. S1, F2 ON-LINE DATA (H→E)  
L, 0

55. S1, F3 SELECTED EQUIPMENT STATUS REQUEST (H→E)  
Function requests the values of certain status variables in a predefined order.

L, n  
5011 <U4 SVID>  
...  
n. <U4 SVID>

- A zero-length list or item means report all SVID.

56. S1, F4 SELECTED EQUIPMENT STATUS DATA (H←E)  
L, n  
1. <\* SV>  
n. <\* SV>

A, Bi, Bo, F4, F8, L, I1, I2, I4, U1, U2, U4

- A zero-length U1 for SV means that the SVID does not exist.

57. S1, F11 STATUS VARIABLE NAMELIST REQUEST (H→E)  
A request from the host to the machine to report the name and units of certain status variables, in the order requested.

L, n  
5011 <U4 SVID>  
...  
n. <U4 SVID>

- A zero-length means report all SVID.

58. S1, F12 STATUS VARIABLE NAMELIST REPLY (H←E)  
L, n  
1. L, 3  
1. <U4 SVID>  
2. <A SVNAME>  
3. <A UNITS>  
...  
n. L, 3  
1. <U4 SVID>  
2. <A SVNAME>  
3. <A UNITS>

59. S1, F13 ESTABLISH COMMUNICATIONS REQUEST (H→E)  
Initiate an attempt to establish a SECS-II communications link at a logical level on power-up or after a break in the link. It is the first message sent after either of the above conditions.

L, 0

60. S1, F14 ESTABLISH COMMUNICATIONS REQUEST ACKNOWLEDGE (H→E)  
L, 2  
1. <Bi COMMACK>  
2. L, 0

61. S1, F13 ESTABLISH COMMUNICATIONS REQUEST (H←E)

Initiate an attempt to establish a SECS-II communications link at a logical level on power-up or after a break in the link. It is the first message sent after either of the above conditions. If no response is received from the host, the machine will periodically send a S1F13 message until a S1F14 with the correct COMMACK is received.

L, 2

1. <A MDLN>
2. <A SOFTREV>

62. S1, F14 ESTABLISH COMMUNICATIONS REQUEST ACKNOWLEDGE (H←E)

L, 2

1. <Bi COMMACK>
2. L, 2
  1. <A MDLN>
  2. <A SOFTREV>

STREAM 2: EQUIPMENT CONTROL AND DIAGNOSTICS

63. S2, F13 EQUIPMENT CONSTANT REQUEST (H→E)

Function requests the values of certain equipment constants in a predefined order.

L, n

5011 <U4 ECID>

...

n. <U4 ECID>

- A zero-length list or item means report all ECID.

64. S2, F14 EQUIPMENT CONSTANT DATA (H←E)

L, n

5011 <\* ECV>

...

n. <\* ECV>

A, Bi, Bo, F4, F8, I1, I2, I4, U1, U2, U4

- A zero-length U1 ECV means that ECID does not exist.

65. S2, F15 NEW EQUIPMENT CONSTANT SEND (H→E)

Host updates the values of specified EC. If the host returns a non-zero EAC the machine cannot alter the value of any ECID specified in the S2F15 body.

L, n

5011 L, 2

<U4 ECID>

<\* ECV>

...

n. L, 2

<U4 ECID>

<\* ECV>

A, Bi, Bo, F4, F8, I1, I2, I4, U1, U2, U4

66. S2, F16 NEW EQUIPMENT CONSTANT ACKNOWLEDGE (H←E)

<Bi EAC>

67. S2, F33 DEFINE REPORT (H→E)

Function requests to define a group of event reports. One or more Report IDs is specified, each containing a list of variable IDs to be included in the report.

```

L, 2
  1. <U4 DATAID>
  2. L, a
    1. L, 2
      1. <U4 RPTID>
      2. L, b
        1. <U4 VID>
        ...
    1. <U4 VID>
    ...
    a. L, 2
      1. <U4 RPTID>
      2. L, c
        1. <U4 VID>
        ...
  2. <U4 VID>

```

- A zero-length list following DATAID deletes all report definitions and associated links. See S2, F35.
- A zero-length list following RPTID deletes report type RPTID. All CEID links to this RPTID are also deleted.

68. S2, F34 DEFINE REPORT ACKNOWLEDGE ( $H \leftarrow E$ )  
 <Bi DRACK>

69. S2, F35 LINK EVENT REPORT ( $H \rightarrow E$ )

The host links Report IDs (RPTID) to Collection event IDs (CEID). These linked event reports default to “disabled” upon linking. That is, the occurrence of an event would not cause the report to be sent until enabled. See S2, F37 for enabling events.

```

L, 2
  1. <U4 DATAID>
  2. L, a
    1. L, 2
      1. <U4 CEID>
      2. L, b
        1. <RPTID>
        ...
    3. <RPTID>
    ...
    a. L, 2
      1. <CEID>
      2. L, c
        1. <RPTID>
        ...
  4. <RPTID>

```

- A zero-length list following CEID deletes all report links to that event.

70. S2, F36 LINK EVENT REPORT ACKNOWLEDGE ( $H \leftarrow E$ )  
 <Bi LRACK>

71. S2, F37 ENABLE/DISABLE EVENT REPORT ( $H \rightarrow E$ )

Host requests to enable or disable reporting for a list of Collection events (CEID).

```

L, 2
  1. <Bo CEED>
  2. L, n
    1. <U4 CEID>

```

...  
n. <U4 CEID>

- A zero-length list means all CEID.

72. S2, F38 ENABLE/DISABLE EVENT REPORT ACKNOWLEDGE (H←E)  
<Bi ERACK>

73. S2, F39 HOST COMMAND SEND (H→E)  
If a S2,F23, S2,F33, S2,F35, S2,F45, or S2,F49 message is more than one block, this transaction must precede the message.  
L, 2  
1. <DATAID>  
2. <DATALENGTH>

74. S2, F40 MULTI-BLOCK GRANT (DMBG) (H←E)  
Grant permission to send multi-block message.  
<GRANT>

75. S2, F41 HOST COMMAND SEND (H→E)  
The host sends a command to the machine for execution with the relevant parameters. Following remote commands are currently supported.

76. S2, F42 HOST COMMAND ACKNOWLEDGE (H←E)  
L, 2  
1. <HCACK>  
2. L, n  
1. L, 2  
1. <A CPNAME>  
2. <Bi CPACK>  
...  
n. L, 2  
1. <Bi CPNAME>  
2. <A CPACK>

- If there are no invalid parameters, then a list of zero length will be sent for item 2.

## STREAM 5: EXCEPTION REPORTING

77. S5, F1 ALARM REPORT SEND (H←E)  
This message reports a change in a defined alarm. Thus, both setting and clearing an alarm will have distinct alarms.

L, 3  
1. <Bi ALCD>  
2. <U4 ALID>  
3. <A ALTX>

78. S5, F2 ALARM REPORT ACKNOWLEDGE (H→E)  
<Bi ACKC5>

79. S5, F3 ENABLE/DISABLE ALARM SEND (H→E)  
This message enables or disables an alarm from being reported to the host. Some alarms (safety related) are not controllable in this way.

L, 2

1. <Bi ALED>

2. <U4 ALID>

- A zero-length item for ALID means all alarms.

80. S5, F4 ENABLE/DISABLE ALARM ACKNOWLEDGE ( $H \leftarrow E$ )

<Bi ACKC5>

81. S5, F5 LIST ALARMS REQUEST ( $H \rightarrow E$ )

The host requests the machine to send information on currently defined alarms.

L, n

5011 <U4 ALID>

...

n. <U4 ALID>

- A zero-length item means send all possible alarms regardless of the state of ALED.

82. S5, F6 LIST ALARMS DATA ( $H \leftarrow E$ )

This message contains the alarm data known to the equipment. There are “m” alarms in the list.

L, m

1. L, 3

1. <Bi ALCD>

2. <U4 ALID>

3. <A ALTX>

...

m. L, 3

1. <Bi ALCD>

2. <U4 ALID>

3. <A ALTX>

- If m = 0, no response can be made. A zero-length item returned for ALCD or ALTX means that value does not exist.

## STREAM 6: DATA COLLECTION

83. S6, F11 EVENT REPORT SEND ( $H \leftarrow E$ )

The machine sends a defined, event linked and enabled group of reports to the host on a linked event. This is a message that possibly requires a preceding S6, F5/F6 multi-block enquire/grant transaction.

L, 3

1. <U4 DATAID>

2. <U4 CEID>

3. L, a

1. L, 2

1. <U4 RPTID>

2. L, b

1. <\*V>

...

5. <\*V>

...

a. L, 2

1. <U4 RPTID>

2. L, c

1. <\*V>

...

6. <\*V>

A, Bi, Bo, F4, F8, L, I1, I2, I4, U1, U2, U4

- If there are no reports linked to the event a “null” report is assumed. A zero-length list for # of reports means there are no reports linked to the given CEID.

84. S6, F12 EVENT REPORT ACKNOWLEDGE (H→E)

**<Bi ACKC6>**

## STREAM 7: PROCESS PROGRAM MANAGEMENT

85. S7, F1 PROCESS PROGRAM LOAD INQUIRE (H↔E)

This message is used to initiate the transfer of a process program.

**L, 2**

1. **<A PPID>**
2. **<U4 LENGTH>**

86. S7, F2 PROCESS PROGRAM LOAD GRANT (H↔E)

**<Bi PPGNT>**

87. S7, F3 PROCESS PROGRAM SEND (H↔E)

The purpose of this message is to send the process program.

**L, 2**

1. **<A PPID>**
2. **<Bi PPBODY>**

88. S7, F4 PROCESS PROGRAM ACKNOWLEDGE (H↔E)

**<Bi ACKC7>**

89. S7, F5 PROCESS PROGRAM REQUEST (H↔E)

This message is used to request the transfer of a process program.

**<A PPID>**

90. S7, F6 PROCESS PROGRAM DATA (H↔E)

This message is used to request the transfer of a process program.

**L, 2**

1. **<A PPID>**
2. **<Bi PPBODY>**

- A zero-length list means request denied.

91. S7, F17 DELETE PROCESS PROGRAM SEND (H→E)

This message is used by the host to request the deletion of a process program.

**L, n**

**5011 <A PPID>**

**...**

**n. <A PPID>**

92. S7, F18 DELETE PROCESS PROGRAM ACKNOWLEDGE (H←E)

**<Bi ACKC7>**

93. S7, F19 CURRENT EPPD REQUEST (H→E)

This message is used by the host to request the name of the process program directory (EPPD) in use.

**Header only**

94. S7, F20 CURRENT EPPD DATA (H←E) L, N

5011 <PPID>

...

n. <PPID>

95. S7F, 23 FORMATTED PROCESS PROGRAM SEND (H↔E)

This message allows movement of formatted process programs between a piece of equipment and its host system. The values of MDLN and SOFTREV are obtained from the PCD used to generate the process program. If S7,F23 is multi-block, it must be preceded by the S7F1/F2 Inquire/Grant transaction.

L, 4

1. <PPID>

2. <MDLN>

3. <SOFTREV>

4. L, c (c = Number of Process Commands)

1. L, 2

1. <CCODE>

2. L, p (p = Number of Parameters)

1. <PPARM<sub>i</sub>>

.

.

p. <PPARM<sub>p</sub>>

2. L, 2

.

.

2 L, 2

96. S7, F24 FORMATTED PROCESS PROGRAM ACKNOWLEDGE (H↔E)

Acknowledges reception of a formatted process program at its destination and whether the process program was accepted by the interpreter. A returned status of "accepted" by the interpreter means only that the message is understood. The validity of the contents of the process program is determined through a separate transaction (S7,F27/S7,F28).

<ACKC7>

97. S7, F25 FORMATTED PROCESS PROGRAM REQUEST (H↔E)

This message is used by either equipment or host to request a particular process program from the other.

<PPID>

## STREAM 9: SYSTEM ERRORS

98. S9, F1 UNRECOGNIZED DEVICE ID (H↔E)

Device ID specified in block header is not defined in the machine.

<Bi MHEAD>

99. S9, F3 UNRECOGNIZED STREAM TYPE (H↔E)

Machine does not recognize the stream type in the message block header.

<Bi MHEAD>

100. S9, F5 UNRECOGNIZED FUNCTION TYPE (H←E)

Machine does not recognize the function type in the message block header.

<Bi MHEAD>

101. S9, F7 ILLEGAL DATA (H←E)

This error signifies that the stream and function were correctly interpreted but the associated data was not.



**<Bi MHEAD>**

102. S9, F9 TRANSACTION TIMER TIMEOUT (H←E)

This error specifies that a transaction / receive timer has timed out and the transaction aborted. The host system should respond to this message in a suitable manner to keep the system operational.

**<Bi SHEAD>**

103. S9, F11 DATA TOO LONG (H←E)

The machine has been sent more data than it can handle.

**<Bi MHEAD>**

104. S9, F13 CONVERSATION TIMEOUT (H←E)

Machine informs host that data was expected, but none was received within time period given.

L, 2

1. <A MEXP>
2. <A EDID>

STREAM 10: TERMINAL SERVICES

105. S10, F3 TERMINAL DISPLAY (SINGLE) (H→E)

The host requests a text message be displayed on the machine.

L, 2

1. <Bi TID>
2. <A TEXT>

106. S10, F4 TERMINAL DISPLAY (SINGLE) ACKNOWLEDGE (H←E)

**<Bi ACKC10>**

STREAM 14: E142 MAP REQUEST

107. S14, F1 GETATTR REQUEST (H←E)

L, 5

1. <A OBJSPEC>
2. <A OBJTYPE='E142Substrate'>
3. L, i
1. <A OBJID<sub>1</sub>='FrameID'> //note Frame ID
4. L, 1
  1. L, 3
1. <ATTRID='SubstrateType'>
2. <ATTRDATA<sub>1</sub>='Wafer'> //Note will be "Tray" for tray map request
3. <ATTRRELN=0>
5. L, 1
  1. <ATTRID='MapData'>

108. S14, F2 GETATTR DATA (H→E)

L, 2

1. L, 1
2. L, 2
  1. L, 1

## 7. L,2

1.<ATTRID='MapData'>

2. <ATTRDATA=

//Map



### DATA ITEM DEFINITION TABLE

Variable	Description	Values
ABS	Any binary string	
ACKC6	Acknowledge code	0 = Accepted > 0 = Error, not accepted 1-63 Reserved
ACKC7	Acknowledge code	0 = Accepted 1 = Permission not granted 2 = Length error 3 = Matrix overflow 4 = PPID not found 5 = Mode unsupported 6-63 Reserved
ACKC10	Acknowledge code	0 = Accepted for display 1 = Message will not be displayed 2 = Terminal not available 3-63 Reserved
ALCD	Alarm code byte	bit 8 = 1 Alarm set bit 8 = 0 Alarm clear bit 7-1 Alarm category, not used
ALED	Alarm enable/disable code	bit 8 = 1 Enable alarm bit 8 = 0 Disable alarm
ALID	Alarm identification	
ALTX	Alarm text limited to 40 characters	
CEED	Collection event enable/disable code	FALSE = Disable TRUE = Enable
CEID	Collected event ID	
COMMACK	Establish communications acknowledge code	0 = Accepted 1 = Denied 2-63 Reserved
CPACK	Command parameter acknowledge code	1 = Parameter Name (CPNAME does not exist

		2 = Illegal value specified for CPVAL 3 = Illegal format specified by CPVAL >3 Other equipment-specific error 4-63 Reserved
CPNAME	Command parameter name	
CPVAL	Command parameter value	
DATAID	Data ID	
DATALength	Total bytes to be sent	
DRACK	Define report acknowledge code	0 = Accept 1 = Denied, insufficient space 2 = Denied, invalid format 3 = Denied, at least one RPTID already defined 4 = Denied, at least VID does not exist. >4 Other errors 5-63 Reserved
DSPER	Data sample period	hhmmss, 6 bytes
EAC	Equipment acknowledge code	0 = Acknowledge 1 = Denied, At least one constant does not exist. 2 = Denied, busy 3 = Denied, at least one constant out of range. >3 Other equipment-specific error 4-63 Reserved
ECDEF	Equipment constant default value	
ECID	Equipment constant ID	
ECMAX	Equipment constant maximum value	
ECMIN	Equipment constant minimum value	
ECNAME	Equipment constant name	
ECV	Equipment constant value	
EDID	Expected data identification	Possible responses: MEXP EDID EDID S07F03 <PPID> A[16]
ERACK	Enable/disable event report	0 = Accepted 1 = Denied >1 Other errors 2-63 Reserved
FCNID	Function identification	
GRANT	Grant code	0 = Permission granted 1 = Busy, try again 2 = No space available 3 = Duplicate DATAID >3 Equipment specific error code

		4-63	Reserved
GRANT6	Permission to send	0 = 1 = 2 = >2 3-63	Permission granted Busy, try again Not interested Other errors Reserved
HACK	Host command parameter acknowledge code	0 = 1 = 2 = 3 = 4 = 5 = 6 = 7-63	Acknowledge Command does not exist Cannot perform now At least one parameter is invalid Acknowledge, command will be performed with completion signaled later Rejected, already in the desired condition No such object exists Reserved
LENGTH	Length of the service program or process program in bytes		
LIMITACK	Acknowledgment code for variable limit attribute set	1 = 2 = 3 = 4 = 5 = 6 = 7 = >7 error 8-63	LIMITID does not exist UPPERDB > LIMITMAX LOWERDB < LIMITMIN UPPERDB < LOWERDB Illegal format specified for UPPERDB or LOWERDB ASCII value cannot be translated to numeric Duplicate limit definition for this variable Other equipment-specific error Reserved
LIMITID	The identifier of a specific limit in the set of limits (as defined by UPPERDB and LOWERDB) for a variable to which the corresponding limit attributes refer		
LIMITMAX	The maximum allowed value for the limit values of a specific variable. The equipment manufacturer should specify this value, which would typically coincide with the maximum value of the variable being monitored. The format must match that of the referenced variable.		
LIMITMIN	The minimum allowed value for the limit values of a specific variable. The equipment manufacturer should specify this value, which would typically coincide with the minimum value of the variable being monitored. The format must match that of the referenced variable.		
LOWERDB	A variable limit attribute, which defines the lower boundary of the		

	dead-band of a limit. The value applies to a single limit (*LIMITID) for a specified VID. Thus, UPPERDB and LOWERDB as a pair define a limit.	
LRACK	Link report acknowledge code	0 = Accepted 1 = Denied, Insufficient space 2 = Denied, Invalid format 3 = Denied, At least one CEID link already defined 4 = Denied, At least one CEID does not exist 5 = Denied, At least one RPTID does not exist >5 Other errors 6-63 Reserved
LVACK	Variable limit definition, acknowledge code. Defines the error with limit attributes for the reference VID.	1 = Variable does not exist 2 = Variable has no limits capability 3 = Variable repeated in message 4 = Limit value error as described in LIMITACK 5-63 Reserved
MDLN	Equipment Model Type, 6 bytes max	
MEXP	Message expected	SXX, FYY X = stream Y = function
MHEAD	SECS message block header associated with message block in error	
OFLACK	Acknowledge code for OFF-LINE request	0 = OFF-LINE Acknowledge 1-63 Reserved
ONLACK	Acknowledge code for ON-LINE	0 = ON-LINE Accepted 1 = ON-LINE Not Allowed 2 = Equipment Already ON-LINE 3-63 Reserved
PPBODY	Process program body	
PPGNT	Process program grant status	0 = OK 1 = Already have 2 = No space 3 = Invalid PPID 4 = Busy, try later 5 = Will not accept >5 Other error 6-63 Reserved
PPID	Process program ID	
REPGSZ	Reporting group size	
RPTID	Report ID	
RSDA	Request spool data acknowledge	0 = OK 1 = Denied, busy, try later

		2 = Denied, spooled data does not exist 3-63 Reserved
RSDC	Request spool data code	0 = Transmit spooled messages 1 = Purge spooled messages 2-63 Reserved
RSPACK	Reset spooling acknowledge	0 = Acknowledge, spooling setup accepted 1 = Spooling setup rejected 2-63 Reserved
SHEAD	Stored header related to the transaction timer	
SMPLN	Sample number	
SOFTREV	Software revision code 6 bytes maximum	
STIME	Sample time	same as TME
STRID	Stream identification	
SV	Status variable value	
SVID	Status variable ID	
SVNAME	Status variable name	
TEXT	A single line of characters.	
TIAACK	Equipment acknowledgment code	0 = Everything correct 1 = Too many SVID 2 = No more traces allowed 3 = Invalid period >3 Equipment-specific error 4-63 Reserved
TIACK	Time acknowledge code	0 = OK 1 = Error, not done 2-63 Reserved
TID	Terminal number	
TIME	Time of day	If 12 bytes the format is YYMMDDhhmmss YY = year 00 to 99 MM = month 01 to 12 DD = day 01 to 31 hh = hour 00 to 23 mm = minute 00 to 59 ss = second 00 to 59 If 16 bytes the format is YYYYMMDDhhmmsscc YYYY = year 0000 to 9999 MM = month 01 to 12 DD = day 01 to 31 hh = hour 00 to 23 mm = minute 00 to 59 ss = second 00 to 59 cc = centisecond 00 to 99
TOTSMP	Total samples to be made	
TRID	Trace request ID	

UNITS	Units Identifier	
UPPERDB	A variable limit attribute that defines the upper boundary of the dead-band of a limit. The value applies to a single limit (LIMITID) for a specified VID. Thus, UPPERDB and LOWERDB as a pair define a limit.	
V	Variable data	
VID	Variable ID	
VLAACK	Variable Limit Attribute Acknowledge Code	0 = Acknowledge, command will be performed. 1 = Limit attribute definition error 2 = Cannot perform now >2 Equipment-specific error 3-63 Reserved

A, Bi, Bo, F4, F8, I1, I2, I4, U1, U2, U4

## ALL DEFINITIONS

### ALL COLLECTION EVENTS

CEID	Event Name	Description	Associated DataVariables	Associated Data Variable IDs
0	ControlStateLocal	Control State Machine switched to local (operator) control.		
1	ControlStateRemote	Control State Machine switched to remote (host) control.		
2	EquipmentOffline	Control State Machine switched to the offline state by the machine operator.		
3	MaterialReceived	Material arrived from a port on the equipment.		
4	MaterialRemoved	Material was sent from a port on the equipment.		
5	MessageRecognition	Machine operator recognized the terminal service message from the host.		
6	OperatorCommandIssued	Machine operator issued a control command.	OperatorCommand	6
7	PPChange	A process program (recipe) has been created changed or deleted.	PPChangeName PPChangeStatus	3 4
8	PPSelected	A new process program (recipe) has been accepted. Either the host or machine operator has selected the recipe.	ProcessStateString PPBodyIsValid	2032 112
9	ProcessingCompleted	Normal exit of EXECUTING state as part of the Processing State Machine.	PreviousProcessState	2030
10	ProcessingStarted	Normal exit of EXECUTING state as part of the Processing State Machine.	PreviousProcessState	2030
11	ProcessingStateChange	The state of the Processing State Machine has changed.	PreviousProcessState ProcessState	2030 2031

12	ProcessingStopped	A previously requested STOP command has been performed.	PreviousProcessState	2030
16	ECChange	An equipment constant value was changed locally by the operator.	ECID ECChangeName ECChangeValue	7 2052 2053
18	HostCommandAccepted	A host remote command was accepted.	HostCmdName HostCmdHostID	10 11
19	HostECChange	A host changed an equipment constant (EC) value.	HostECHostID HostECID ECID	8 9 7
20	HostPPChange	A host changed a Process Program.	HostPPChangeName HostPPChangeStatus HostPPChangeHostID	12 13 14
21	PPVerificationFailed	Recipe Verification Failed	PPError	2010
410	REMOTECMDEVENT_QUERY_TRAYMAPLIST	Event triggered if remote cmd <b>QUERY_TRAYMAPLIST</b> accepted	TRAYMAPLIST	6010
411	REMOTECMDEVENT_QUERY_WAFERMAPLIST	Event triggered if remote cmd <b>QUERY_WAFERMAPLIST</b> accepted	WAFERMAPLIST	6011
412	REMOTECMDEVENT_UPLOAD_TRAYMAP	Event triggered if remote cmd <b>UPLOAD_TRAYMAP</b> accepted	UPLOAD_TRAYMAP	6012
413	REMOTECMDEVENT_UPLOAD_WAFERMAP	Event triggered if remote cmd <b>UPLOAD_WAFERMAP</b> accepted	UPLOAD_WAFERMAP	6013
414	REMOTECMDEVENT_QUERY_TRAYMAPLIST_FAILED	Event triggered if remote cmd <b>QUERY_TRAYMAPLIST</b> not accepted		
415	REMOTECMDEVENT_QUERY_WAFERMAPLIST_FAILED	Event triggered if remote cmd <b>QUERY_WAFERMAPLIST</b> not accepted		
416	REMOTECMDEVENT_UPLOAD_TRAYMAP_FAILED	Event triggered if remote cmd <b>UPLOAD_TRAYMAP</b> not accepted		
417	REMOTECMDEVENT_UPLOAD_WAFERMAP_FAILED	Event triggered if remote cmd <b>UPLOAD_WAFERMAP</b> accepted		
503	ProcessingState_Aborted	Event triggered when the Tool transitions from ABORTING to ABORTED as the result of an ABORT command	ProcessStateString PreviousProcessState ProcessState AbortedBinCode	2032 2030 2031 5536
504	ProcessingState_IDLE	Event triggered when Tool transitions to the IDLE state	ProcessStateString PreviousProcessState ProcessState	2032 2030 2031
505	ProcessingState_INITALARMS	Event triggered when the Tool transitions from INIT to INITWITH ALARMS IDLE as the result of a problem during initialization	ProcessStateString PreviousProcessState ProcessState	2032 2030 2031
506	ProcessingState_PAUSED	Event triggered when Tool transitions to the PAUSED state	ProcessStateString PreviousProcessState ProcessState	2032 2030 2031
507	ProcessingState_READY	Event triggered when Tool transitions to the READY state	ProcessStateString PreviousProcessState ProcessState	2032 2030 2031
508	ProcessingState_SETTING_UP	Event triggered when Tool transitions to the SETTING UP state as the result of a PP_SELECT command	ProcessStateString PreviousProcessState ProcessState	2032 2030 2031
509	ProcessingState_ALARMPAUSED	Event triggered when Tool transitions to the ALARMPAUSED state as the result of an alarm	ProcessStateString PreviousProcessState ProcessState	2032 2030 2031
510	ProcessingState_ABORTING	Event triggered when Tool transitions to the ABORTING state as a result of receiving an ABORT command	ProcessStateString PreviousProcessState ProcessState	2032 2030 2031
511	ProcessingState_EXECUTING	Event triggered when a wafer is ready to be processed	ProcessStateString PreviousProcessState ProcessState	2032 2030 2031
512	ProcessingState_STOPPING	Event triggered when Tool transitions to the STOPPING state as a result of receiving a STOP command	ProcessStateString PreviousProcessState ProcessState	2032 2030 2031



513	ProcessingState_CHECKING	Event triggered when Tool transitions to the CHECKING state as a result of receiving a RESUME command	ProcessStateString PreviousProcessState ProcessState	2032 2030 2031
514	ProcessingState_INIT	Event triggered when Tool transitions to the INIT state	ProcessStateString PreviousProcessState ProcessState	2032 2030 2031
1001	AlarmSET	Alarm is set	AlarmID	0
2001	AlarmCLEAR	Alarm is cleared	AlarmID	
10000	ProcessProgramOkay	Equipment validated downloaded recipe	ISRECIPEOKAY	8009
9000	indexing_downset_1_pitch	Event triggered when indexing downset 1 pitch	power_during_indexing_max power_during_indexing_average torques_during_indexing_max torques_during_indexing_average index_speed_max index_speed_average index_step	7035 7036 7037 7038 7039 7040 7042
9001	indexing_12_pitch	Event triggered when Indexing 12 pitch	power_during_indexing_max power_during_indexing_average torques_during_indexing_max torques_during_indexing_average index_step	7044 7045 7046 7047 7051
9002	indexing_visual_inspection	Event triggered when Indexing at visual inspection 1 pitch	power_during_indexing_max power_during_indexing_average torques_during_indexing_max torques_during_indexing_average index_speed_max index_speed_average index_step	7053 7054 7055 7056 7057 7058 7060
9003	indexing_downset_unit	Event triggered when Indexing downset unit	up_position_downset_tool_measured down_position_downset_tool_measured moving_speed_downset_tool_measured up_position_support_plate_measured down_position_support_plate_measured moving_speed_support_plate_measured force_during_downset_measured_max force_during_downset_measured_average force_during_movement_measured_max cleaning_air_pressure cleaning_exhaust tape_lift_sensor	7089 7091 7093 7095 7097 7099 7101 7102 7104 7105 7106 7107
9004	indexing_jetter_dispense_01	Event triggered when Indexing Jetter dispense unit 01	Jetter_dispense_unit_01_air_pressure Jetter_dispense_unit_01_counter_pulses Jetter_dispense_unit_01_counter_cleaning_cycles Jetter_dispense_unit_01_direct_light_level Jetter_dispense_unit_01_indirect_light_level	8109 8127 8129 8138 8139 8138 8139
9005	indexing_jetter_dispense_02	Event triggered when Indexing Jetter dispense unit 02	Jetter_dispense_unit_02_air_pressure Jetter_dispense_unit_02_counter_pulses	8209 8227 8229 8238

			Jetter_dispense_unit_02_counter_cleaning_cycles Jetter_dispense_unit_02_direct_light_level Jetter_dispense_unit_02_indirect_light_level	8239
9006	indexing_jetter_dispense_03	Event triggered when Indexing Jetter dispense unit 03	Jetter_dispense_unit_03_air_pressure Jetter_dispense_unit_03_counter_pulses Jetter_dispense_unit_03_counter_cleaning_cycles Jetter_dispense_unit_03_direct_light_level Jetter_dispense_unit_03_indirect_light_level	8309 8327 8329 8338 8339
9007	indexing_jetter_dispense_04	Event triggered when Indexing Jetter dispense unit 04	Jetter_dispense_unit_04_air_pressure Jetter_dispense_unit_04_counter_pulses Jetter_dispense_unit_04_counter_cleaning_cycles Jetter_dispense_unit_04_direct_light_level Jetter_dispense_unit_04_indirect_light_level	8409 8427 8429 8438 8439
9008	indexing_jetter_dispense_05	Event triggered when Indexing Jetter dispense unit 05	Jetter_dispense_unit_05_air_pressure Jetter_dispense_unit_05_counter_pulses Jetter_dispense_unit_05_counter_cleaning_cycles Jetter_dispense_unit_05_direct_light_level Jetter_dispense_unit_05_indirect_light_level	8509 8527 8529 8538 8539
9009	indexing_jetter_dispense_06	Event triggered when indexing Jetter dispense unit 06	Jetter_dispense_unit_06_air_pressure Jetter_dispense_unit_06_counter_pulses Jetter_dispense_unit_06_counter_cleaning_cycles Jetter_dispense_unit_06_direct_light_level Jetter_dispense_unit_06_indirect_light_level	8609 8627 8629 8638 8639
9010	indexing_pin_curing_station	Event triggered when indexing Pin Curing station	curing_force_max curing_force_min_in_down_position curing_force_average_in_down_position curing_temperature_max__bottom_zone_1 curing_temperature_min__bottom_zone_1 curing_temperature_average__bottom_zone_1 curing_parallelism up_position_curing down_position_curing moving_speed_curing_max up_position_support_plate down_position_support_plate moving_speed_support_plate_max power_for_all_motors_max power_for_all_motors_average	7179 7180 7181 7184 7185 7186 7189 7190 7192 7194 7195 7197 7199 7200 7201
9011	pin_curing_station_paper_empty	Event triggered when paper is empty Pin Curing station	silicon_paper_empty	7202

9012	indexing_electrical_inline_test	Event triggered when indexing electrical inline test	total_number_of_contacting_cycles pass_fail_each_position fail_each_index_cycle tested_each_index_cycle up_position_test_head down_position_test_head moving_speed_test_head_max up_position_support_plate down_position_support_plate moving_speed_support_plate_max force_max force_average	7217 7218 7219 7220 7221 7223 7225 7226 7228 7230 7231 7232
9013	Indexing_plasma_unit	Event triggered when indexing Plasma unit	pressure power runtime step_width axis_start_position axis_end_position axis_standby_position temperature rotation_speed_nozzle	7235 7236 7237 7238 7239 7240 7241 7242 7243
9014	Indexing_jetter_sealing_01	Event triggered when indexing Jetter sealing unit 01	Jetter_sealing_01_air_pressure Jetter_sealing_01_counter_pulses Jetter_sealing_01_counter_cleaning_cycles Jetter_sealing_01_direct_light_level Jetter_sealing_01_indirect_light_level	7453 7471 7473 7482 7483
9015	indexing_jetter_sealing_02	Event triggered when indexing Jetter sealing unit 02	Jetter_sealing_02_air_pressure Jetter_sealing_02_counter_pulses Jetter_sealing_02_counter_cleaning_cycles Jetter_sealing_02_direct_light_level Jetter_sealing_02_indirect_light_level	7553 7571 7573 7482 7483
9016	indexing_jetter_sealing_03	Event triggered when indexing Jetter sealing unit 03	Jetter_sealing_03_air_pressure Jetter_sealing_03_counter_pulses Jetter_sealing_03_counter_cleaning_cycles Jetter_sealing_03_direct_light_level Jetter_sealing_03_indirect_light_level	7653 7671 7673 7482 7483
9017	indexing_jetter_sealing_04	Event triggered when indexing Jetter sealing unit 04	Jetter_sealing_04_air_pressure Jetter_sealing_04_counter_pulses Jetter_sealing_04_counter_cleaning_cycles Jetter_sealing_04_direct_light_level Jetter_sealing_04_indirect_light_level	7753 7771 7773 7482 7483
9018	indexing_jetter_sealing_05	Event triggered when indexing Jetter sealing unit 05	Jetter_sealing_05_air_pressure Jetter_sealing_05_counter_pulses Jetter_sealing_05_counter_cleaning_cycles Jetter_sealing_05_direct_light_level Jetter_sealing_05_indirect_light_level	7853 7871 7873 7482 7483
9019	indexing_jetter_sealing_06	Event triggered when indexing Jetter sealing unit 06	Jetter_sealing_06_air_pressure Jetter_sealing_06_counter_pulses Jetter_sealing_06_counter_cleaning_cycles Jetter_sealing_06_direct_light_level	7953 7971 7973 7482 7483

			Jetter_sealing_06_indirect_light_level	
9020	indexing_curing_oven	Event triggered when indexing Oven for curing	temperature_sensor_1 temperature_sensor_2 temperature_sensor_3 transport_speed_max transport_speed_average exhaust_level cooling_air_pressure power_during_indexing_max power_during_indexing_min power_during_indexing_average torques_during_indexing_max torques_during_indexing_min torques_during_indexing_average time_at_curing	7307 7308 7309 7312 7313 7314 7315 7316 7317 7318 7319 7320 7321 7322
9021	curing_oven_data_every_10_min	Event triggered after every 10 min interval	temperature_sensor_1 temperature_sensor_2 temperature_sensor_3	7307 7308 7309
9022	module_height_measurement	Event triggered after each Module height measurement	force_air_pressure_during_punching counter_for_track_1 counter_for_track_2	7342 7345 7346
9023	bad_mark_punch	Event triggered on every bad mark punch	X_position Y_position up_position_of_puncher down_position_of_puncher force_air_pressure_during_punching air_pressure_max air_pressure_average number_of_punchings	7351 7352 7353 7354 7355 7356 7357 7358
9024	jetter_dispense_01_at_module	Event triggered on Jetter dispense unit 01 module	Jetter_dispense_unit_01_X_moving_speed_measured_max Jetter_dispense_unit_01_y_moving_speed_measured_max Jetter_dispense_unit_01_X_work_position_measured Jetter_dispense_unit_01_y_work_position_measured Jetter_dispense_unit_01_module_detected_yes_no Jetter_dispense_unit_01_detecting_level Jetter_dispense_unit_01_module_offset_correction_X Jetter_dispense_unit_01_module_offset_correction_Y Bin_code_module	8119 8120 8123 8124 8132 8133 8136 8137 7025
9025	jetter_dispense_02_at_module	Event triggered on Jetter dispense unit 02 module	Jetter_dispense_unit_02_X_moving_speed_measured_max Jetter_dispense_unit_02_y_moving_speed_measured_max Jetter_dispense_unit_02_X_work_position_measured Jetter_dispense_unit_02_y_work_position_measured Jetter_dispense_unit_02_module_detected_yes_no Jetter_dispense_unit_02_detecting_level Jetter_dispense_unit_02_module_offset_correction_X Jetter_dispense_unit_02_module_offset_correction_Y Bin_code_module	8219 8220 8223 8224 8232 8233 8236 8237 7025
9026	jetter_dispense_03_at_module	Event triggered on Jetter dispense unit 03 module	Jetter_dispense_unit_03_X_moving_speed_measured_max	8319 8320 8323

			Jetter_dispense_unit_03_y_moving _speed_measured_max Jetter_dispense_unit_03_X_work_ position_measured Jetter_dispense_unit_03_y_work_p osition_measured Jetter_dispense_unit_03_module_ detected_yes_no Jetter_dispense_unit_03_detecting _level Jetter_dispense_unit_03_module_ offset_correction_X Jetter_dispense_unit_03_module_ offset_correction_Y Bin_code_module	8324 8332 8333 8336 8337 7025
9027	jetter_dispense_04_at_module	Event triggered on Jetter dispense unit 04 module	Jetter_dispense_unit_04_X_moving _speed_measured_max Jetter_dispense_unit_04_y_moving _speed_measured_max Jetter_dispense_unit_04_X_work_ position_measured Jetter_dispense_unit_04_y_work_p osition_measured Jetter_dispense_unit_04_module_ detected_yes_no Jetter_dispense_unit_04_detecting _level Jetter_dispense_unit_04_module_ offset_correction_X Jetter_dispense_unit_04_module_ offset_correction_Y Bin_code_module	8419 8420 8423 8424 8432 8433 8436 8437 7025
9028	jetter_dispense_05_at_module	Event triggered on Jetter dispense unit 05 module	Jetter_dispense_unit_05_X_moving _speed_measured_max Jetter_dispense_unit_05_y_moving _speed_measured_max Jetter_dispense_unit_05_X_work_ position_measured Jetter_dispense_unit_05_y_work_p osition_measured Jetter_dispense_unit_05_module_ detected_yes_no Jetter_dispense_unit_05_detecting _level Jetter_dispense_unit_05_module_ offset_correction_X Jetter_dispense_unit_05_module_ offset_correction_Y Bin_code_module	8519 8520 8523 8524 8532 8533 8536 8537 7025
9029	jetter_dispense_06_at_module	Event triggered on Jetter dispense unit 06 module	Jetter_dispense_unit_06_X_moving _speed_measured_max Jetter_dispense_unit_06_y_moving _speed_measured_max Jetter_dispense_unit_06_X_work_ position_measured Jetter_dispense_unit_06_y_work_p osition_measured Jetter_dispense_unit_06_module_ detected_yes_no Jetter_dispense_unit_06_detecting _level Jetter_dispense_unit_06_module_ offset_correction_X Jetter_dispense_unit_06_module_ offset_correction_Y Bin_code_module	8619 8620 8623 8624 8632 8633 8636 8637 7025
9030	jetter_sealing_01_at_module	Event triggered on Jetter sealing unit 01 module	Jetter_sealing_01_X_moving_spee d_measured_max	7463 7464 7467

			Jetter_sealing_01_y_moving_speed _measured_max Jetter_sealing_01_X_work_position _measured Jetter_sealing_01_y_work_position _measured Jetter_sealing_01_module_detecte d_yes_no Jetter_sealing_01_detecting_level Jetter_sealing_01_module_offset_c orrection_X Jetter_sealing_01_module_offset_c orrection_Y Bin_code_module	7468 7476 7477 7480 7481 7025
9031	jetter_sealing_02_at_module	Event triggered on Jetter sealing unit 02 module	Jetter_sealing_02_X_moving_spee d_measured_max Jetter_sealing_02_y_moving_speed _measured_max Jetter_sealing_02_X_work_position _measured Jetter_sealing_02_y_work_position _measured Jetter_sealing_02_module_detecte d_yes_no Jetter_sealing_02_detecting_level Jetter_sealing_02_module_offset_c orrection_X Jetter_sealing_02_module_offset_c orrection_Y Bin_code_module	7563 7564 7567 7568 7576 7577 7580 7581 7025
9032	jetter_sealing_03_at_module	Event triggered on Jetter sealing unit 03 module	Jetter_sealing_03_X_moving_spee d_measured_max Jetter_sealing_03_y_moving_speed _measured_max Jetter_sealing_03_X_work_position _measured Jetter_sealing_03_y_work_position _measured Jetter_sealing_03_module_detecte d_yes_no Jetter_sealing_03_detecting_level Jetter_sealing_03_module_offset_c orrection_X Jetter_sealing_03_module_offset_c orrection_Y Bin_code_module	7663 7664 7667 7668 7676 7677 7680 7681 7025
9033	jetter_sealing_04_at_module	Event triggered on Jetter sealing unit 04 module	Jetter_sealing_04_X_moving_spee d_measured_max Jetter_sealing_04_y_moving_speed _measured_max Jetter_sealing_04_X_work_position _measured Jetter_sealing_04_y_work_position _measured Jetter_sealing_04_module_detecte d_yes_no Jetter_sealing_04_detecting_level Jetter_sealing_04_module_offset_c orrection_X Jetter_sealing_04_module_offset_c orrection_Y Bin_code_module	7763 7764 7767 7768 7776 7777 7780 7781 7025
9034	jetter_sealing_05_at_module	Event triggered on Jetter sealing unit 05 module	Jetter_sealing_05_X_moving_spee d_measured_max Jetter_sealing_05_y_moving_speed _measured_max Jetter_sealing_05_X_work_position _measured	7863 7864 7867 7868 7876 7877 7880

			Jetter_sealing_05_y_work_position_measured Jetter_sealing_05_module_detected_yes_no Jetter_sealing_05_detecting_level Jetter_sealing_05_module_offset_correction_X Jetter_sealing_05_module_offset_correction_Y Bin_code_module	7881 7025
9035	jetter_sealing_06_at_module	Event triggered on Jetter sealing unit 06 module	Jetter_sealing_06_X_moving_speed_measured_max Jetter_sealing_06_y_moving_speed_measured_max Jetter_sealing_06_X_work_position_measured Jetter_sealing_06_y_work_position_measured Jetter_sealing_06_module_detected_yes_no Jetter_sealing_06_detecting_level Jetter_sealing_06_module_offset_correction_X Jetter_sealing_06_module_offset_correction_Y Bin_code_module	7963 7964 7967 7968 7976 7977 7980 7981 7025
9036	jedec_tray_handler_event	Event triggered on JEDEC tray handler	tray_number	7162
9037	indexing_dispense_AOI	Event triggered on Dispense AOI	Dispense_AOI_direct_light_level Dispense_AOI_indirect_light_level	7157 7158
9038	indexing_post_bond_inspection	Event triggered on Post-Bond Inspection	Post_Bond_Inspection_direct_light_level Post_Bond_Inspection_indirect_light_level	7174 7175
9039	indexing_final_bond_inspection	Event triggered on Final-Bond Inspection	Post_Final_Bond_Inspection_direct_light_level Post_Final_Bond_Inspection_indirect_light_level	7214 7215
9040	indexing_sealing_AOI	Event triggered on Sealing AOI indexing	Sealing_AOI_direct_light_level Sealing_AOI_indirect_light_level	7301 7302
9041	indexing_VI_assembly_module	Event triggered on VI module assembly indexing	VI_module_assembly_indirect_light_level	7331 7332
9042	indexing_VI_ISO_module	Event triggered on VI module ISO indexing	VI_module_ISO_direct_light_level VI_module_ISO_indirect_light_level	7339 7340
9043	indexing_bad_hole_detection	Event triggered on Input bad hole detection unit	Input_bad_hole_detection_unit_light_level_track_1 Input_bad_hole_detection_unit_light_level_track_2	7086 7087
9044	bad_hole_detection_at_module	Event triggered at bad hole detection module	Input_bad_hole_detection_unit_bad_hole_detected_yes_no Input_bad_hole_detection_unit_X_position_tape Input_bad_hole_detection_unit_Y_position_tape Input_bad_hole_detection_unit_detecting_level_measured Input_bad_hole_detection_unit_offset_correction	7077 7078 7079 7082 7085
9045	sealing_AOI_at_module	Event triggered at Sealing AOI module	Sealing_AOI_module_pass_fail Sealing_AOI_x_position_of_each_dot_measured Sealing_AOI_y_position_of_each_dot_measured Sealing_AOI_detecting_level_glue_area Sealing_AOI_detecting_level_no_glue_area Sealing_AOI_Jetter_ID_of_dispensed_module	7291 7292 7293 7295 7297 7294 7025

			Bin_code_module	
9046	dispense_AOI_at_module	Event triggered at Dispense AOI module	Dispense_AOI_module_pass_fail Dispense_AOI_x_position_of_each_dot_measured Dispense_AOI_y_position_of_each_dot_measured Dispense_AOI_detecting_level_glue_area Dispense_AOI_detecting_level_no_glue_area Dispense_AOI_Jetter_ID_of_dispen sed_module Bin_code_module	7147 7148 7149 7151 7153 7150 7025
9047	post_bond_inspection_module	Event triggered at Post-Bond Inspection module	Post_Bond_Inspection_module_pa ss_fail Post_Bond_Inspection_x_position_of_each_placed_module Post_Bond_Inspection_y_position_of_each_placed_module Post_Bond_Inspection_rotation_of_each_module	7165 7166 7167 7168
9048	final_bond_inspection_module	Event triggered at Final-Bond Inspection module	Post_Final_Bond_Inspection_modu le_pass_fail Post_Final_Bond_Inspection_x_pos ition_of_each_module Post_Final_Bond_Inspection_y_pos ition_of_each_module Post_Final_Bond_Inspection_rotati on_of_each_module Post_Final_Bond_Inspection_detec ting_level_spec_min Post_Final_Bond_Inspection_detec ting_level_spec_max Bin_code_module	7204 7205 7206 7207 7212 7213 7025
9049	VI_module_assembly_event	Event triggered at VI assembly module	VI_module_assembly_module_pass _fail VI_module_assembly_detecting_le vel_abnormality Bin_code_module	7326 7327 7025
9050	VI_module_ISO_event	Event triggered at VI ISO module	VI_module_ISO_module_pass_fail VI_module_ISO_detecting_level_ab normality Bin_code_module	7334 7335 7025
9051	input_spooler_winding	Event triggered on Input Spooler winding cycle	winding_direction power_during_winding buffer_full buffer_half_full buffer_empty interline_full	7028 7029 7030 7031 7032 7033
9052	output_spooler_winding	Event triggered on Output Spooler winding cycle	power_during_winding buffer_full buffer_half_full buffer_empty interline_empty	7071 7072 7073 7074 7075
9053	buffer_1_winding	Event triggered on Buffer1 winding cycle	buffer_full buffer_half_full buffer_empty	7062 7063 7064
9054	buffer_2_winding	Event triggered on Buffer2 winding cycle	buffer_full buffer_half_full buffer_empty	7066 7067 7068
8000	ExecuteRemoteCommandResponse	Event triggered on ExecuteRemoteCommandResponse received from equipment	ExecuteRemoteCommandResponse Data	9000
8001	GetProductsResponse	Event triggered on GetProductsResponse received from equipment	GetProductsResponseData	9001
8002	SelectProductResponse	Event triggered on SelectProductResponse received from equipment	SelectProductResponseData	9002



8003	DownloadProductResponse	Event triggered on DownloadProductResponse received from equipment	DownloadProductResponseData	9003
8004	UploadProductResponse	Event triggered on UploadProductResponse received from equipment	UploadProductResponseData	9004
8005	SetTerminalMessageResponse	Event triggered on SetTerminalMessageResponse received from equipment	SetTerminalMessageResponseData	9005
8006	GetUsersResponse	Event triggered on GetUsersResponse received from equipment	GetUsersResponseData	9006
8007	GetLoggedInUsersResponse	Event triggered on GetLoggedInUsersResponse received from equipment	GetLoggedInUsersResponseData	9007
8008	CreateLotResponse	Event triggered on CreateLotResponse received from equipment	CreateLotResponseData	9008
8009	GetLotResponse	Event triggered on GetLotResponse received from equipment	GetLotResponseData	9009
8010	GetLotsResponse	Event triggered on GetLotsResponse received from equipment	GetLotsResponseData	9010
8011	UpdateLotResponse	Event triggered on UpdateLotResponse received from equipment	UpdateLotResponseData	9011
8012	DeleteLotResponse	Event triggered on DeleteLotResponse received from equipment	DeleteLotResponseData	9012
8013	RenameProductResponse	Event triggered on RenameProductResponse received from equipment	RenameProductResponseData	9013
8050	VariableChanged	Event triggered on VariableChanged received from equipment	VariableChangedData	9050
8051	ModuleProcessStateChanged	Event triggered on ModuleProcessStateChanged received from equipment	ModuleProcessStateChangedData	9051
8052	MaterialReceived	Event triggered on MaterialReceived received from equipment	MaterialReceivedData	9052
8053	MaterialProcessed	Event triggered on MaterialProcessed received from equipment	MaterialProcessedData	9053
8054	MaterialRemoved	Event triggered on MaterialRemoved received from equipment	MaterialRemovedData	9054
8055	UserLoggedIn	Event triggered on UserLoggedIn received from equipment	UserLoggedInData	9055
8056	UserLoggedOut	Event triggered on UserLoggedOut received from equipment	UserLoggedOutData	9056
8057	UserCreated	Event triggered on UserCreated received from equipment	UserCreatedData	9057
8058	UserDeleted	Event triggered on UserDeleted received from equipment	UserDeletedData	9058
8059	ControlStateChanged	Event triggered on ControlStateChanged received from equipment	ControlStateChangedData	9059
8060	LotCreated	Event triggered on LotCreated received from equipment	LotCreatedData	9060
8061	LotDeleted	Event triggered on LotDeleted received from equipment	LotDeletedData	9061
8062	LotStarted	Event triggered on LotStarted received from equipment	LotStartedData	9062
8063	LotCompleted	Event triggered on LotCompleted received from equipment	LotCompleted_Name LotCompleted_Count LotCompleted_Product LotCompleted_BadCount LotCompleted_GoodCount LotCompleted_Yield LotCompleted_StartTime LotCompleted_EndTime LotCompleted_AssemblyLotID LotCompleted_AssemblyLotQty LotCompleted_AssemblyLotRejects	9077 9078 9079 9080 9081 9082 9083 9084 9085 9086 9087
8064	LotAborted	Event triggered on LotAborted received from equipment	LotAbortedData	9064
8065	LotPaused	Event triggered on LotPaused received from equipment	LotPausedData	9065
8066	LotResumed	Event triggered on LotResumed received from equipment	LotResumedData	9066

8067	ProductCreated	Event triggered on ProductCreated received from equipment	ProductCreatedData	9067
8068	ProductSelected	Event triggered on ProductSelected received from equipment	ProductSelectedData	9068
8069	ProductDeleted	Event triggered on ProductDeleted received from equipment	ProductDeletedData	9069
8070	ProductStored	Event triggered on ProductStored received from equipment	ProductStoredData	9070
8071	ProductDownloaded	Event triggered on ProductDownloaded received from equipment	ProductDownloadedData	9071
8072	OperatorCommandExecuted	Event triggered on OperatorCommandExecuted received from equipment	OperatorCommandExecutedData	9072
8073	ItemsProcessStarted	Event triggered on ItemsProcessStarted received from equipment	ItemsProcessStartedData	9073
8074	ItemsProcessCompleted	Event triggered on ItemsProcessCompleted received from equipment	ItemsProcessCompletedData	9074
8075	ItemProcessStarted	Event triggered on ItemProcessStarted received from equipment	ItemProcessStartedData	9075
8076	ItemProcessCompleted	Event triggered on ItemProcessCompleted received from equipment	ItemProcessCompletedData	9076
8077	MaterialReport	Event triggered on MaterialReport received from equipment	MaterialReport_LotName MaterialReport_AssemblyLotID MaterialReport_MaterialId MaterialReport_MaterialConsumption MaterialReport_LGRejects	9088 9089 9090 9091 9092
8078	ItemCompleted	Event triggered on ItemCompleted received from equipment	ItemCompletedData	9095

## ALL EQUIPMENT CONSTANTS

ECID	Variable Name	Description	Type	Min	Max	Default
4000	EstablishCommunicationsTimeout	Communication attempt timeout. When the Communication State Machine is enabled but not communicating the machine will attempt to establish communication with a host every timeout period.	U2	0		10
4011	WbitS10	Request host reply for stream 10 messages (Terminal Services). Possible values include 1 (reply) 0 (no reply).	Bo	0	1	1
4012	WbitS5	Request host reply for stream 5 messages (Alarms). Possible values include 1 (reply) 0 (no reply).	Bo	0	1	1
4013	WbitS6	Request host reply for stream 6 messages (Events). If the machine is producing frequent collection events it may be a good idea to disable request reply. Possible values include 1 (reply) 0 (no reply).	Bo	0	1	1
4020	TimeFormat	Time format selection. Possible values include 1 (compliant 16 byte); 0 (not compliant 12 byte) and 2 (Extended YYYY-MM-DDThh:mm:ss.sTZD).	U4	0	2	1
4021	DefCtrlOfflineState	State of the Control State Machine when going offline. Possible values include 1 – Equipment Offline 3 – Host Offline	U1	1	3	3
4022	EventReportMsg	Specifies the event report message. Possible values include 67083 (S6F11) 67075 (S6F3) 67085 (S6F13)	U4	0		67083 hafr: (do not change)

4023	DefaultCommState	The default state of the GEM communications state machine where 0 – disabled and 256 – enabled.	U4	0	256	256
4024	DefaultCtrlState	The default state of the GEM control state machine	U1	0	3	0
4025	HeartBeat	S1F1 message level circuit assurance (0 turns it off)	U2			0
4028	LimitFreq	The frequency at which limits with GetValue callbacks are polled (0 turns it off)	U2			0
4031	S6MultiBlockInquire	Enable or disable the usage of S6F5 multi-block inquire messages.	Bo			0
4036	ExtendedTimeFormat	When TimeFormat-2: 0-report time values in UTC (default setting); 1-local time with timezone offset	U1	0	1	0
4037	UpdateSystemClock	Option for setting System Clock	Bo			1
4038	AutoRejectS2F31	Reject S2F31 Date and Time Set Requests from Host	Bo			0
14902	PDBSecsInterface	Host Configuration ( 0 = No Host, 1 = Infineon Host, 2 = DBMATIK Host Simulator )	U1	0	2	1
301000	MaxSimultaneousTraces	The maximum number of traces that can be requested simultaneously from the host	U4			10
301001	MaxTraceFrequency	The maximum rate at which a host can request a trace report to be delivered	U4			100
301002	MaxTraceVIDs	The maximum number of VIDs that can be requested for any single trace report	U4			500
301005	VariableReportingStyle	S1F3 and S2F23 VID tolerance	U4			1
301006	TraceTimestampTolerance	The allowable variation for any given trace report's timestamp from the expected timestamp before triggering event TraceTimestampOutOfTolerance.	U4			20

301007	ReportGenerationDelay	This value represents the expected amount of time it takes CIMConnect to build a 500 VID Report. This number will be subtracted from the allowed wait time for either an S1F3 request or a Trace Report.	U4			20
301008	TraceReportMultiBlock	This variable represents whether or not CIMConnect can automatically send a multi-block message for Trace Reports that are larger than 244 bytes	U4			1
301009	ReportOfflineControlState	When transitioning to Offline control state report CONTROLSTATE as Offline (1-enable 0-default)	Bo	0	1	1
301011	E30S6F1TOTSMPHandling	Options for sending S6F1 trace reports when TOTSMP is not multiple of REPGSZ	U1	0	1	0
301013	SupportPV2	0 – default behavior; 1 – enable PV2 behavior	U1			0
392000	Use0303S14F20	1-list of 4 items with errcode/errtext pairs; 0-pre E5-0303 with list of 3 items (old behavior)	Bo			1
392001	CheckFmtS14F1	1-check the format of S14F1 message and send S9F7; 2-check the format and send S14F2 with error info; 0-don't check the format (old behavior)	U1			0
5004	recipe	Logistics Lot	A			
5005	product_name	Logistics Lot product name	A			
5080	X_position_tape_desired	Input bad hole detection unit X position tape desired				
5081	y_position_tape_desired	Input bad hole detection unit y position tape desired				
5169	x_position_desired	Post-Bond Inspection x position desired				
5170	y_position_desired	Post-Bond Inspection y position desired				
5171	rotation_desired	Post-Bond Inspection rotation desired				
5177	curing_time	Pin Curing station curing time				
5182	curing_force	Pin Curing station curing force				
5187	curing_temperature_bottom_(each_zone)	Pin Curing station curing temperature bottom (each zone)				
5191	up_position_curing_desired	Pin Curing station up position curing desired				

5193	down_position_curing_desired	Pin Curing station down position curing desired				
5196	up_position_support_plate_desired	Pin Curing station up position support plate desired				
5198	down_position_support_plate_desired	Pin Curing station down position support plate desired				
5209	x_position_desired	Post-Final-Bond Inspection x position desired				
5210	y_position_desired	Post-Final-Bond Inspection y position desired				
5211	rotation_desired	Post-Final-Bond Inspection rotation desired				
5222	up_position_test_head_desired	Electrical inline test up position test head desired				
5224	down_position_test_head_desired	Electrical inline test down position test head desired				
5227	up_position_support_plate_desired	Electrical inline test up position support plate desired				
5229	down_position_support_plate_desired	Electrical inline test down position support plate desired				
5233	force_desired	Electrical inline test force desired				
5244	pressure	Plasma unit pressure				
5245	power	Plasma unit power				
5246	step_width	Plasma unit step width				
5247	axis_start_position	Plasma unit axis start position				
5248	axis_end_position	Plasma unit axis end position				
5249	axis_standby_position	Plasma unit axis standby position				
5250	temperature	Plasma unit temperature				
5251	rotation_speed_nozzle	Plasma unit rotation speed nozzle				
5304	temperature_setting	Oven for curing temperature setting				
5305	time_before_stand_by	Oven for curing time before stand by				
5306	all_other_available_parameter	Oven for curing all other available parameter				
5311	stand_by_temperature	Oven for curing stand by temperature				
5344	max_allowed_height	Module height measurement max allowed height				
5350	punch_unit_on/off	Bad mark punch punch unit on/off				
5049	index_speed_average	Indexing 12 pitch index speed average				
5050	index_delay	Indexing 12 pitch index delay				
5059	index_delay	Indexing at visual inspection 1 pitch index delay				
5070	winding_direction	Output spooler winding direction				
5090	up_position_downset_tool_desired	Downset unit up position downset tool desired				
5092	down_position_downset_tool_desired	Downset unit down position downset tool desired				
5094	moving_speed_downset_tool_desired	Downset unit moving speed downset tool desired				
5096	up_position_support_plate_desired	Downset unit up position support plate desired				
5098	down_position_support_plate_desired	Downset unit down position support plate desired				
5100	moving_speed_support_plate_desired	Downset unit moving speed support plate desired				
5103	force_desired	Downset unit force desired				
5041	Indexing_downset_1_pitch_index_delay	Indexing downset 1 pitch index delay				
5048	Indexing_12_pitch_index_speed_max	Indexing 12 pitch index speed max				
5454	Jetter_sealing_01_rising	Jetter sealing unit 01 rising				
5455	Jetter_sealing_01_falling	Jetter sealing unit 01 falling				
5456	Jetter_sealing_01_open_time	Jetter sealing unit 01 open time				
5457	Jetter_sealing_01_needle_lift	Jetter sealing unit 01 needle lift				
5458	Jetter_sealing_01_number_of_pulses	Jetter sealing unit 01 number of pulses				

5459	Jetter_sealing_01_nozzle_heater_temperature	Jetter sealing unit 01 nozzle heater temperature				
5460	Jetter_sealing_01_number_of_clean_cycles	Jetter sealing unit 01 number of clean cycles				
5461	Jetter_sealing_01_clean_interval_time	Jetter sealing unit 01 clean interval time				
5462	Jetter_sealing_01_clean_interval_number_of_pulses	Jetter sealing unit 01 clean interval number of pulses				
5465	Jetter_sealing_01_X_moving_speed_desired	Jetter sealing unit 01 X moving speed desired				
5466	Jetter_sealing_01_y_moving_speed_desired	Jetter sealing unit 01 y moving speed desired				
5469	Jetter_sealing_01_X_work_position_desired	Jetter sealing unit 01 X work position desired				
5470	Jetter_sealing_01_y_work_position_desired	Jetter sealing unit 01 y work position desired				
5474	Jetter_sealing_01_x_position_of_each_dot	Jetter sealing unit 01 x position of each dot				
5475	Jetter_sealing_01_y_position_of_each_dot	Jetter sealing unit 01 y position of each dot				
5554	Jetter_sealing_02_rising	Jetter sealing unit 02 rising				
5555	Jetter_sealing_02_falling	Jetter sealing unit 02 falling				
5556	Jetter_sealing_02_open_time	Jetter sealing unit 02 open time				
5557	Jetter_sealing_02_needle_lift	Jetter sealing unit 02 needle lift				
5558	Jetter_sealing_02_number_of_pulses	Jetter sealing unit 02 number of pulses				
5559	Jetter_sealing_02_nozzle_heater_temperature	Jetter sealing unit 02 nozzle heater temperature				
5560	Jetter_sealing_02_number_of_clean_cycles	Jetter sealing unit 02 number of clean cycles				
5561	Jetter_sealing_02_clean_interval_time	Jetter sealing unit 02 clean interval time				
5562	Jetter_sealing_02_clean_interval_number_of_pulses	Jetter sealing unit 02 clean interval number of pulses				
5565	Jetter_sealing_02_X_moving_speed_desired	Jetter sealing unit 02 X moving speed desired				
5566	Jetter_sealing_02_y_moving_speed_desired	Jetter sealing unit 02 y moving speed desired				
5569	Jetter_sealing_02_X_work_position_desired	Jetter sealing unit 02 X work position desired				
5570	Jetter_sealing_02_y_work_position_desired	Jetter sealing unit 02 y work position desired				
5574	Jetter_sealing_02_x_position_of_each_dot	Jetter sealing unit 02 x position of each dot				
5575	Jetter_sealing_02_y_position_of_each_dot	Jetter sealing unit 02 y position of each dot				
5654	Jetter_sealing_03_rising	Jetter sealing unit 03 rising				
5655	Jetter_sealing_03_falling	Jetter sealing unit 03 falling				
5656	Jetter_sealing_03_open_time	Jetter sealing unit 03 open time				
5657	Jetter_sealing_03_needle_lift	Jetter sealing unit 03 needle lift				
5658	Jetter_sealing_03_number_of_pulses	Jetter sealing unit 03 number of pulses				
5659	Jetter_sealing_03_nozzle_heater_temperature	Jetter sealing unit 03 nozzle heater temperature				
5660	Jetter_sealing_03_number_of_clean_cycles	Jetter sealing unit 03 number of clean cycles				
5661	Jetter_sealing_03_clean_interval_time	Jetter sealing unit 03 clean interval time				
5662	Jetter_sealing_03_clean_interval_number_of_pulses	Jetter sealing unit 03 clean interval number of pulses				
5665	Jetter_sealing_03_X_moving_speed_desired	Jetter sealing unit 03 X moving speed desired				
5666	Jetter_sealing_03_y_moving_speed_desired	Jetter sealing unit 03 y moving speed desired				

5669	Jetter_sealing_03_X_work_position_desired	Jetter sealing unit 03 X work position desired				
5670	Jetter_sealing_03_y_work_position_desired	Jetter sealing unit 03 y work position desired				
5674	Jetter_sealing_03_x_position_of_each_dot	Jetter sealing unit 03 x position of each dot				
5675	Jetter_sealing_03_y_position_of_each_dot	Jetter sealing unit 03 y position of each dot				
5754	Jetter_sealing_04_rising	Jetter sealing unit 04 rising				
5755	Jetter_sealing_04_falling	Jetter sealing unit 04 falling				
5756	Jetter_sealing_04_open_time	Jetter sealing unit 04 open time				
5757	Jetter_sealing_04_needle_lift	Jetter sealing unit 04 needle lift				
5758	Jetter_sealing_04_number_of_pulses	Jetter sealing unit 04 number of pulses				
5759	Jetter_sealing_04_nozzle_heater_temperature	Jetter sealing unit 04 nozzle heater temperature				
5760	Jetter_sealing_04_number_of_clean_cycles	Jetter sealing unit 04 number of clean cycles				
5761	Jetter_sealing_04_clean_interval_time	Jetter sealing unit 04 clean interval time				
5762	Jetter_sealing_04_clean_interval_number_of_pulses	Jetter sealing unit 04 clean interval number of pulses				
5765	Jetter_sealing_04_X_moving_speed_desired	Jetter sealing unit 04 X moving speed desired				
5766	Jetter_sealing_04_y_moving_speed_desired	Jetter sealing unit 04 y moving speed desired				
5769	Jetter_sealing_04_X_work_position_desired	Jetter sealing unit 04 X work position desired				
5770	Jetter_sealing_04_y_work_position_desired	Jetter sealing unit 04 y work position desired				
5774	Jetter_sealing_04_x_position_of_each_dot	Jetter sealing unit 04 x position of each dot				
5775	Jetter_sealing_04_y_position_of_each_dot	Jetter sealing unit 04 y position of each dot				
5854	Jetter_sealing_05_rising	Jetter sealing unit 05 rising				
5855	Jetter_sealing_05_falling	Jetter sealing unit 05 falling				
5856	Jetter_sealing_05_open_time	Jetter sealing unit 05 open time				
5857	Jetter_sealing_05_needle_lift	Jetter sealing unit 05 needle lift				
5858	Jetter_sealing_05_number_of_pulses	Jetter sealing unit 05 number of pulses				
5859	Jetter_sealing_05_nozzle_heater_temperature	Jetter sealing unit 05 nozzle heater temperature				
5860	Jetter_sealing_05_number_of_clean_cycles	Jetter sealing unit 05 number of clean cycles				
5861	Jetter_sealing_05_clean_interval_time	Jetter sealing unit 05 clean interval time				
5862	Jetter_sealing_05_clean_interval_number_of_pulses	Jetter sealing unit 05 clean interval number of pulses				
5865	Jetter_sealing_05_X_moving_speed_desired	Jetter sealing unit 05 X moving speed desired				
5866	Jetter_sealing_05_y_moving_speed_desired	Jetter sealing unit 05 y moving speed desired				
5869	Jetter_sealing_05_X_work_position_desired	Jetter sealing unit 05 X work position desired				
5870	Jetter_sealing_05_y_work_position_desired	Jetter sealing unit 05 y work position desired				
5874	Jetter_sealing_05_x_position_of_each_dot	Jetter sealing unit 05 x position of each dot				
5875	Jetter_sealing_05_y_position_of_each_dot	Jetter sealing unit 05 y position of each dot				
5954	Jetter_sealing_06_rising	Jetter sealing unit 06 rising				
5955	Jetter_sealing_06_falling	Jetter sealing unit 06 falling				
5956	Jetter_sealing_06_open_time	Jetter sealing unit 06 open time				



5957	Jetter_sealing_06_needle_lift	Jetter sealing unit 06 needle lift				
5958	Jetter_sealing_06_number_of_pulses	Jetter sealing unit 06 number of pulses				
5959	Jetter_sealing_06_nozzle_heater_temperature	Jetter sealing unit 06 nozzle heater temperature				
5960	Jetter_sealing_06_number_of_clean_cycles	Jetter sealing unit 06 number of clean cycles				
5961	Jetter_sealing_06_clean_interval_time	Jetter sealing unit 06 clean interval time				
5962	Jetter_sealing_06_clean_interval_number_of_pulses	Jetter sealing unit 06 clean interval number of pulses				
5965	Jetter_sealing_06_X_moving_speed_desired	Jetter sealing unit 06 X moving speed desired				
5966	Jetter_sealing_06_y_moving_speed_desired	Jetter sealing unit 06 y moving speed desired				
5969	Jetter_sealing_06_X_work_position_desired	Jetter sealing unit 06 X work position desired				
5970	Jetter_sealing_06_y_work_position_desired	Jetter sealing unit 06 y work position desired				
5974	Jetter_sealing_06_x_position_of_each_dot	Jetter sealing unit 06 x position of each dot				
5975	Jetter_sealing_06_y_position_of_each_dot	Jetter sealing unit 06 y position of each dot				
6110	Jetter_dispense_unit_01_rising	Jetter dispense unit 01 rising				
6111	Jetter_dispense_unit_01_rising_falling	Jetter dispense unit 01 falling				
6112	Jetter_dispense_unit_01_rising_open_time	Jetter dispense unit 01 open time				
6113	Jetter_dispense_unit_01_rising_needle_lift	Jetter dispense unit 01 needle lift				
6114	Jetter_dispense_unit_01_rising_number_of_pulses	Jetter dispense unit 01 number of pulses				
6115	Jetter_dispense_unit_01_rising_nozzle_heater_temperature	Jetter dispense unit 01 nozzle heater temperature				
6116	Jetter_dispense_unit_01_rising_number_of_clean_cycles	Jetter dispense unit 01 number of clean cycles				
6117	Jetter_dispense_unit_01_rising_clean_interval_time	Jetter dispense unit 01 clean interval time				
6118	Jetter_dispense_unit_01_rising_clean_interval_number_of_pulses	Jetter dispense unit 01 clean interval number of pulses				
6121	Jetter_dispense_unit_01_rising_X_moving_speed_desired	Jetter dispense unit 01 X moving speed desired				
6122	Jetter_dispense_unit_01_rising_y_moving_speed_desired	Jetter dispense unit 01 y moving speed desired				
6125	Jetter_dispense_unit_01_rising_X_work_position_desired	Jetter dispense unit 01 X work position desired				
6126	Jetter_dispense_unit_01_rising_y_work_position_desired	Jetter dispense unit 01 y work position desired				
6130	Jetter_dispense_unit_01_rising_x_position_of_each_dot	Jetter dispense unit 01 x position of each dot				
6131	Jetter_dispense_unit_01_rising_y_position_of_each_dot	Jetter dispense unit 01 y position of each dot				
6210	Jetter_dispense_unit_02_rising	Jetter dispense unit 02 rising				
6211	Jetter_dispense_unit_02_rising_falling	Jetter dispense unit 02 falling				
6212	Jetter_dispense_unit_02_rising_open_time	Jetter dispense unit 02 open time				
6213	Jetter_dispense_unit_02_rising_needle_lift	Jetter dispense unit 02 needle lift				
6214	Jetter_dispense_unit_02_rising_number_of_pulses	Jetter dispense unit 02 number of pulses				
6215	Jetter_dispense_unit_02_rising_nozzle_heater_temperature	Jetter dispense unit 02 nozzle heater temperature				
6216	Jetter_dispense_unit_02_rising_number_of_clean_cycles	Jetter dispense unit 02 number of clean cycles				
6217	Jetter_dispense_unit_02_rising_clean_interval_time	Jetter dispense unit 02 clean interval time				

6218	Jetter_dispense_unit_02_rising_clean_int erval_number_of_pulses	Jetter dispense unit 02 clean interval number of pulses				
6221	Jetter_dispense_unit_02_rising_X_moving _speed_desired	Jetter dispense unit 02 X moving speed desired				
6222	Jetter_dispense_unit_02_rising_y_moving _speed_desired	Jetter dispense unit 02 y moving speed desired				
6225	Jetter_dispense_unit_02_rising_X_work_ position_desired	Jetter dispense unit 02 X work position desired				
6226	Jetter_dispense_unit_02_rising_y_work_p osition_desired	Jetter dispense unit 02 y work position desired				
6230	Jetter_dispense_unit_02_rising_x_positio n_of_each_dot	Jetter dispense unit 02 x position of each dot				
6231	Jetter_dispense_unit_02_rising_y_positio n_of_each_dot	Jetter dispense unit 02 y position of each dot				
6310	Jetter_dispense_unit_03_rising	Jetter dispense unit 03 rising				
6311	Jetter_dispense_unit_03_rising_falling	Jetter dispense unit 03 falling				
6312	Jetter_dispense_unit_03_rising_open_tim e	Jetter dispense unit 03 open time				
6313	Jetter_dispense_unit_03_rising_needle_li ft	Jetter dispense unit 03 needle lift				
6314	Jetter_dispense_unit_03_rising_number_ of_pulses	Jetter dispense unit 03 number of pulses				
6315	Jetter_dispense_unit_03_rising_nozzle_h eater_temperature	Jetter dispense unit 03 nozzle heater temperature				
6316	Jetter_dispense_unit_03_rising_number_ of_clean_cycles	Jetter dispense unit 03 number of clean cycles				
6317	Jetter_dispense_unit_03_rising_clean_int erval_time	Jetter dispense unit 03 clean interval time				
6318	Jetter_dispense_unit_03_rising_clean_int erval_number_of_pulses	Jetter dispense unit 03 clean interval number of pulses				
6321	Jetter_dispense_unit_03_rising_X_moving _speed_desired	Jetter dispense unit 03 X moving speed desired				
6322	Jetter_dispense_unit_03_rising_y_moving _speed_desired	Jetter dispense unit 03 y moving speed desired				
6325	Jetter_dispense_unit_03_rising_X_work_ position_desired	Jetter dispense unit 03 X work position desired				
6326	Jetter_dispense_unit_03_rising_y_work_p osition_desired	Jetter dispense unit 03 y work position desired				
6330	Jetter_dispense_unit_03_rising_x_positio n_of_each_dot	Jetter dispense unit 03 x position of each dot				
6331	Jetter_dispense_unit_03_rising_y_positio n_of_each_dot	Jetter dispense unit 03 y position of each dot				
6410	Jetter_dispense_unit_04_rising	Jetter dispense unit 04 rising				
6411	Jetter_dispense_unit_04_rising_falling	Jetter dispense unit 04 falling				
6412	Jetter_dispense_unit_04_rising_open_tim e	Jetter dispense unit 04 open time				
6413	Jetter_dispense_unit_04_rising_needle_li ft	Jetter dispense unit 04 needle lift				
6414	Jetter_dispense_unit_04_rising_number_ of_pulses	Jetter dispense unit 04 number of pulses				
6415	Jetter_dispense_unit_04_rising_nozzle_h eater_temperature	Jetter dispense unit 04 nozzle heater temperature				
6416	Jetter_dispense_unit_04_rising_number_ of_clean_cycles	Jetter dispense unit 04 number of clean cycles				
6417	Jetter_dispense_unit_04_rising_clean_int erval_time	Jetter dispense unit 04 clean interval time				
6418	Jetter_dispense_unit_04_rising_clean_int erval_number_of_pulses	Jetter dispense unit 04 clean interval number of pulses				
6421	Jetter_dispense_unit_04_rising_X_moving _speed_desired	Jetter dispense unit 04 X moving speed desired				
6422	Jetter_dispense_unit_04_rising_y_moving _speed_desired	Jetter dispense unit 04 y moving speed desired				
6425	Jetter_dispense_unit_04_rising_X_work_ position_desired	Jetter dispense unit 04 X work position desired				

6426	Jetter_dispense_unit_04_rising_y_work_position_desired	Jetter dispense unit 04 y work position desired				
6430	Jetter_dispense_unit_04_rising_x_position_of_each_dot	Jetter dispense unit 04 x position of each dot				
6431	Jetter_dispense_unit_04_rising_y_position_of_each_dot	Jetter dispense unit 04 y position of each dot				
6510	Jetter_dispense_unit_05_rising	Jetter dispense unit 05 rising				
6511	Jetter_dispense_unit_05_rising_falling	Jetter dispense unit 05 falling				
6512	Jetter_dispense_unit_05_rising_open_time	Jetter dispense unit 05 open time				
6513	Jetter_dispense_unit_05_rising_needle_lift	Jetter dispense unit 05 needle lift				
6514	Jetter_dispense_unit_05_rising_number_of_pulses	Jetter dispense unit 05 number of pulses				
6515	Jetter_dispense_unit_05_rising_nozzle_heater_temperature	Jetter dispense unit 05 nozzle heater temperature				
6516	Jetter_dispense_unit_05_rising_number_of_clean_cycles	Jetter dispense unit 05 number of clean cycles				
6517	Jetter_dispense_unit_05_rising_clean_interval_time	Jetter dispense unit 05 clean interval time				
6518	Jetter_dispense_unit_05_rising_clean_interval_number_of_pulses	Jetter dispense unit 05 clean interval number of pulses				
6521	Jetter_dispense_unit_05_rising_X_moving_speed_desired	Jetter dispense unit 05 X moving speed desired				
6522	Jetter_dispense_unit_05_rising_y_moving_speed_desired	Jetter dispense unit 05 y moving speed desired				
6525	Jetter_dispense_unit_05_rising_X_work_position_desired	Jetter dispense unit 05 X work position desired				
6526	Jetter_dispense_unit_05_rising_y_work_position_desired	Jetter dispense unit 05 y work position desired				
6530	Jetter_dispense_unit_05_rising_x_position_of_each_dot	Jetter dispense unit 05 x position of each dot				
6531	Jetter_dispense_unit_05_rising_y_position_of_each_dot	Jetter dispense unit 05 y position of each dot				
6610	Jetter_dispense_unit_06_rising	Jetter dispense unit 06 rising				
6611	Jetter_dispense_unit_06_rising_falling	Jetter dispense unit 06 falling				
6612	Jetter_dispense_unit_06_rising_open_time	Jetter dispense unit 06 open time				
6613	Jetter_dispense_unit_06_rising_needle_lift	Jetter dispense unit 06 needle lift				
6614	Jetter_dispense_unit_06_rising_number_of_pulses	Jetter dispense unit 06 number of pulses				
6615	Jetter_dispense_unit_06_rising_nozzle_heater_temperature	Jetter dispense unit 06 nozzle heater temperature				
6616	Jetter_dispense_unit_06_rising_number_of_clean_cycles	Jetter dispense unit 06 number of clean cycles				
6617	Jetter_dispense_unit_06_rising_clean_interval_time	Jetter dispense unit 06 clean interval time				
6618	Jetter_dispense_unit_06_rising_clean_interval_number_of_pulses	Jetter dispense unit 06 clean interval number of pulses				
6621	Jetter_dispense_unit_06_rising_X_moving_speed_desired	Jetter dispense unit 06 X moving speed desired				
6622	Jetter_dispense_unit_06_rising_y_moving_speed_desired	Jetter dispense unit 06 y moving speed desired				
6625	Jetter_dispense_unit_06_rising_X_work_position_desired	Jetter dispense unit 06 X work position desired				
6626	Jetter_dispense_unit_06_rising_y_work_position_desired	Jetter dispense unit 06 y work position desired				
6630	Jetter_dispense_unit_06_rising_x_position_of_each_dot	Jetter dispense unit 06 x position of each dot				
6631	Jetter_dispense_unit_06_rising_y_position_of_each_dot	Jetter dispense unit 06 y position of each dot				

ALL DATA VARIABLES

DVID	Variable Name	Description	Type	Min	Max	Default Value
0	AlarmID	ALID of the most recent alarm to change state.	U4	0		
3	PPChangeName	Name of the process program (recipe) created edited or deleted by the machine operator.	A			
4	PPChangeStatus	Type of change made to a process program (recipe) by the machine operator. Possible values include 1 (created) 2 (edited) and 3 (deleted).	U1	0	255	
6	OperatorCommand	The name of a command issued by the machine operator.	L			
8	HostECHostID	ID of the host that changed the EC value. This may be linked to CE HostECChange. See also DV HostECID.	U4	0		
9	HostECID	ECID changed by another host. This may be linked to CE HostECChange. See also DV HostECHostID.	U4	0		
10	HostCmdName	Name of the remote command sent by another host.	A			
11	HostCmdHostID	ID of the host that sent a remote command.	U4	0		
12	HostPPChangeName	Name of the process program (recipe) changed by another host. This may be linked to collection event HostPPChange. See also DV HostPPChangeStatus and HostPPChangeHostID.	A			
13	HostPPChangeStatus	Type of change made to a process program (recipe) by another host. Possible values include 1 (created) 2 (edited) and 3 (deleted). This may be linked to collection event HostPPChange. See also DV HostPPChangeName and HostPPChangeHostID.	U1	U10	255	0

14	HostPPChangeHostID	ID of the host that changed a process program (recipe).	U4	0	4294 9672 95	0
112	PPBodyIsValid	Name of the recipe that was validated by the tool.	A			
113	E142Map	Updated E142 Map.	A			
2010	PPErrors	A text data value with information about verification errors of a process program (recipe) that failed verification.	U1	0	255	0
2052	ECChangeName	The name of the equipment constant changed by the machine operator.	U4	0		
2053	ECChangeValue	The value of the equipment constant changed by the machine operator.	A			
6000	FrameID	Identification for the Wafer currently being processed.	A			
xxxx	xxxx	xxxx xxxxx.	A			
7028	winding_direction	Input spooler winding direction				
7029	power_during_winding	Input spooler power during winding				
7030	buffer_full	Input spooler buffer full				
7031	buffer_half-full	Input spooler buffer half-full				
7032	buffer_empty	Input spooler buffer empty				
7033	interline_full	Input spooler interline full				
7035	power_during_indexing_max	Indexing downset 1 pitch power during indexing max				
7036	power_during_indexing_average	Indexing downset 1 pitch power during indexing average				
7037	torques_during_indexing_max	Indexing downset 1 pitch torques during indexing max				
7038	torques_during_indexing_average	Indexing downset 1 pitch torques during indexing average				
7039	index_speed_max	Indexing downset 1 pitch index speed max				
7040	index_speed_average	Indexing downset 1 pitch index speed average				
7042	index_step	Indexing downset 1 pitch index step				
7044	power_during_indexing_max	Indexing 12 pitch power during indexing max				
7045	power_during_indexing_average	Indexing 12 pitch power during indexing average				
7046	torques_during_indexing_max	Indexing 12 pitch torques during indexing max				
7047	torques_during_indexing_average	Indexing 12 pitch torques during indexing average				
7051	index_step	Indexing 12 pitch index step				
7053	power_during_indexing_max	Indexing at visual inspection 1 pitch power during indexing max				
7054	power_during_indexing_average	Indexing at visual inspection 1 pitch power during indexing average				
7055	torques_during_indexing_max	Indexing at visual inspection 1 pitch torques during indexing max				
7056	torques_during_indexing_average	Indexing at visual inspection 1 pitch torques during indexing average				

7057	index_speed_max	Indexing at visual inspection 1 pitch index speed max				
7058	index_speed_average	Indexing at visual inspection 1 pitch index speed average				
7060	index_step	Indexing at visual inspection 1 pitch index step				
7062	buffer_full	Buffer 1 buffer full				
7063	buffer_half_full	Buffer 1 buffer half full				
7064	buffer_empty	Buffer 1 buffer empty				
7066	buffer_full	Buffer 2 buffer full				
7067	buffer_half_full	Buffer 2 buffer half full				
7068	buffer_empty	Buffer 2 buffer empty				
7071	power_during_winding	Output spooler power during winding				
7072	buffer_full	Output spooler buffer full				
7073	buffer_half_full	Output spooler buffer half full				
7074	buffer_empty	Output spooler buffer empty				
7075	interline_empty	Output spooler interline empty				
7089	up_position_downset_tool_measured	Downset unit up position downset tool measured				
7091	down_position_downset_tool_measured	Downset unit down position downset tool measured				
7093	moving_speed_downset_tool_measured	Downset unit moving speed downset tool measured				
7095	up_position_support_plate_measured	Downset unit up position support plate measured				
7097	down_position_support_plate_measured	Downset unit down position support plate measured				
7099	moving_speed_support_plate_measured	Downset unit moving speed support plate measured				
7101	force_during_downset_measured_max	Downset unit force during downset measured max				
7102	force_during_downset_measured_average	Downset unit force during downset measured average				
7104	force_during_movement_measured_max	Downset unit force during movement measured max				
7105	cleaning_air_pressure	Downset unit cleaning air pressure				
7106	cleaning_exhaust	Downset unit cleaning exhaust				
7107	tape_lift_sensor	Downset unit tape lift sensor				
7162	tray_number	JEDEC Tray handler tray number				
7179	curing_force_max	Pin Curing station curing force max.				
7180	curing_force_min_in_down_position	Pin Curing station curing force min. in down position				
7181	curing_force_average_in_down_position	Pin Curing station curing force average in down position				
7184	curing_temperature_max_bottom_zone_1	Pin Curing station curing temperature max. bottom zone 1, zone 2,				
7185	curing_temperature_min_bottom_zone_1	Pin Curing station curing temperature min. bottom zone 1, zone 2,				
7186	curing_temperature_average_bottom_zone_1	Pin Curing station curing temperature average bottom zone 1, zone 2,				
7189	curing_parallelism	Pin Curing station curing parallelism				
7190	up_position_curing	Pin Curing station up position curing				
7192	down_position_curing	Pin Curing station down position curing				
7194	moving_speed_curing_max	Pin Curing station moving speed curing max				
7195	up_position_support_plate	Pin Curing station up position support plate				
7197	down_position_support_plate	Pin Curing station down position support plate				
7199	moving_speed_support_plate_max	Pin Curing station moving speed support plate max				
7200	power_for_all_motors_max	Pin Curing station power for all motors max				

7201	power_for_all_motors_average	Pin Curing station power for all motors average				
7202	silicon_paper_empty	Pin Curing station silicon paper empty				
7217	total_number_of_contacting_cycles	Electrical inline test total number of contacting cycles				
7218	pass_fail_each_position	Electrical inline test pass/fail each position				
7219	fail_each_index_cycle	Electrical inline test fail each index cycle				
7220	tested_each_index_cycle	Electrical inline test tested each index cycle				
7221	up_position_test_head	Electrical inline test up position test head				
7223	down_position_test_head	Electrical inline test down position test head				
7225	moving_speed_test_head_max	Electrical inline test moving speed test head max				
7226	up_position_support_plate	Electrical inline test up position support plate				
7228	down_position_support_plate	Electrical inline test down position support plate				
7230	moving_speed_support_plate_max	Electrical inline test moving speed support plate max				
7231	force_max	Electrical inline test force max				
7232	force_average	Electrical inline test force average				
7235	pressure	Plasma unit pressure				
7236	power	Plasma unit power				
7237	runtime	Plasma unit runtime				
7238	step_width	Plasma unit step width				
7239	axis_start_position	Plasma unit axis start position				
7240	axis_end_position	Plasma unit axis end position				
7241	axis_standby_position	Plasma unit axis standby position				
7242	temperature	Plasma unit temperature				
7243	rotation_speed_nozzle	Plasma unit rotation speed nozzle				
7307	temperature_sensor_1	Oven for curing temperature sensor 1				
7308	temperature_sensor_2	Oven for curing temperature sensor 2				
7309	temperature_sensor_3	Oven for curing temperature sensor 3				
7312	transport_speed_max	Oven for curing transport speed max				
7313	transport_speed_average	Oven for curing transport speed average				
7314	exhaust_level	Oven for curing exhaust level				
7315	cooling_air_pressure	Oven for curing cooling air pressure				
7316	power_during_indexing_max	Oven for curing power during indexing max				
7317	power_during_indexing_min	Oven for curing power during indexing min				
7318	power_during_indexing_average	Oven for curing power during indexing average				
7319	torques_during_indexing_max	Oven for curing torques during indexing max				
7320	torques_during_indexing_min	Oven for curing torques during indexing min				
7321	torques_during_indexing_average	Oven for curing torques during indexing average				
7322	time_at_curing	Oven for curing time at curing				
7342	force_air_pressure_during_punching	Module height measurement force / air pressure during punching				
7343	module_height	Module height measurement result				
7345	counter_for_track_1	Module height measurement counter for track 1				
7346	counter_for_track_2	Module height measurement counter for track 2				
7351	X_position	Bad mark punch X position				
7352	Y_position	Bad mark punch Y position				

7353	up_position_of_puncher	Bad mark punch up position of puncher				
7354	down_position_of_puncher	Bad mark punch down position of puncher				
7355	force_air_pressure_during_punching	Bad mark punch force / air pressure during punching				
7356	air_pressure_max	Bad mark punch air pressure max				
7357	air_pressure_avarage	Bad mark punch air pressure avarage				
7358	number_of_punchings	Bad mark punch number of punchings				
7157	Dispense_AOI_direct_light_level	Dispense AOI direct light level				
7158	Dispense_AOI_indirect_light_level	Dispense AOI indirect light level				
7165	Post_Bond_Inspection_module_pass_fail	Post-Bond Inspection module pass fail				
7166	Post_Bond_Inspection_x_position_of_each_placed_module	Post-Bond Inspection x position of each placed module				
7167	Post_Bond_Inspection_y_position_of_each_placed_module	Post-Bond Inspection y position of each placed module				
7168	Post_Bond_Inspection_rotation_of_each_module	Post-Bond Inspection rotation of each module				
7174	Post_Bond_Inspection_direct_light_level	Post-Bond Inspection direct light level				
7175	Post_Bond_Inspection_indirect_light_level	Post-Bond Inspection indirect light level				
7204	Post_Final_Bond_Inspection_module_pass_fail	Post-Final-Bond Inspection module pass fail				
7205	Post_Final_Bond_Inspection_x_position_of_each_module	Post-Final-Bond Inspection x position of each module				
7206	Post_Final_Bond_Inspection_y_position_of_each_module	Post-Final-Bond Inspection y position of each module				
7207	Post_Final_Bond_Inspection_rotation_of_each_module	Post-Final-Bond Inspection rotation of each module				
7212	Post_Final_Bond_Inspection_detecting_level_spec_min	Post-Final-Bond Inspection detecting level spec min each programmed area				
7213	Post_Final_Bond_Inspection_detecting_level_spec_max	Post-Final-Bond Inspection detecting level spec max each programmed area				
7214	Post_Final_Bond_Inspection_direct_light_level	Post-Final-Bond Inspection direct light level				
7215	Post_Final_Bond_Inspection_indirect_light_level	Post-Final-Bond Inspection indirect light level				
7291	Sealing_AOI_module_pass_fail	Sealing AOI module pass fail				
7292	Sealing_AOI_x_position_of_each_dot_measured	Sealing AOI x position of each dot measured				
7293	Sealing_AOI_y_position_of_each_dot_measured	Sealing AOI y position of each dot measured				
7295	Sealing_AOI_detecting_level_glue_area_	Sealing AOI detecting level glue area for each programmed area on each module				
7297	Sealing_AOI_detecting_level_no_glue_area__	Sealing AOI detecting level no glue area for each programmed area				
7301	Sealing_AOI_direct_light_level	Sealing AOI direct light level				
7302	Sealing_AOI_indirect_light_level	Sealing AOI indirect light level				
7326	VI_module_assembly_module_pass_fail	VI module (assembly side) module pass fail				
7327	VI_module_assembly_detecting_level_abnormality	VI module (assembly side) detecting level abnormality for each programmed area on each module				
7331	VI_module_assembly_direct_light_level	VI module (assembly side) direct light level				
7332	VI_module_assembly_indirect_light_level	VI module (assembly side) indirect light level				
7334	VI_module_ISO_module_pass_fail	VI module (ISO side) module pass fail				
7335	VI_module_ISO_detecting_level_abnormality	VI module (ISO side) detecting level abnormality for each programmed area on each module				
7339	VI_module_ISO_direct_light_level	VI module (ISO side) direct light level				
7340	VI_module_ISO_indirect_light_level	VI module (ISO side) indirect light level				
7150	Dispense_AOI_Jetter_ID_of_dispensed_module	Dispense AOI Jetter ID of dispensed module				
7188	Pin_Curing_station_position_in_curing_station	Pin Curing station position in curing station				



7208	Final_Bond_Inspection_stamp_of_curing_station	Post-Final-Bond Inspection stamp of curing station/ position in Curing station				
7294	Sealing_AOI_Jetter_ID_of_dispensed_module	Sealing AOI Jetter ID of dispensed module				
7077	Input_bad_hole_detection_unit_bad_hole_detected _yes_no	Input bad hole detection unit bad hole detected yes/no				
7078	Input_bad_hole_detection_unit_X_position_tape	Input bad hole detection unit X position tape				
7079	Input_bad_hole_detection_unit_y_position_tape	Input bad hole detection unit y position tape				
7082	Input_bad_hole_detection_unit_detecting_level_me asured	Input bad hole detection unit detecting level measured				
7085	Input_bad_hole_detection_unit_offset_correction	Input bad hole detection unit offset correction				
7086	Input_bad_hole_detection_unit_light_level_track_1	Input bad hole detection unit light level track 1				
7087	Input_bad_hole_detection_unit_light_level_track_2	Input bad hole detection unit light level track 2				
7147	Dispense_AOI_module_pass_fail	Dispense AOI module pass fail				
7148	Dispense_AOI_x_position_of_each_dot_measured	Dispense AOI x position of each dot measured				
7149	Dispense_AOI_y_position_of_each_dot_measured	Dispense AOI y position of each dot measured				
7151	Dispense_AOI_detecting_level_glue_area	Dispense AOI detecting level glue area				
7153	Dispense_AOI_detecting_level_no_glue_area	Dispense AOI detecting level no glue area				
7002	Lot_counter	Logistics Lot lot counter / module counter (built up modules per lot)				
7003	Lot_date_time	Logistics Lot date/time				
7023	Failure_messages_Log_File	Logistics failure messages Log Files for Log file analysis				
7025	Bin_code_module	Logistics shift register Bin code module (for each finished module, equipment end)				
7178	Curing_station_curing_time_measured	Pin Curing station curing time measured				
8109	Jetter_dispense_unit_01_air_pressure	Jetter dispense unit 01 air pressure				
8119	Jetter_dispense_unit_01_X_moving_speed_measure d_max	Jetter dispense unit 01 X moving speed measured max				
8120	Jetter_dispense_unit_01_y_moving_speed_measure d_max	Jetter dispense unit 01 y moving speed measured max				
8123	Jetter_dispense_unit_01_X_work_position_measure d	Jetter dispense unit 01 X work position measured				
8124	Jetter_dispense_unit_01_y_work_position_measure d	Jetter dispense unit 01 y work position measured				
8127	Jetter_dispense_unit_01_counter_pulses	Jetter dispense unit 01 counter pulses				
8129	Jetter_dispense_unit_01_counter_cleaning_cycles	Jetter dispense unit 01 counter cleaning cycles				
8132	Jetter_dispense_unit_01_module_detected_yes_no	Jetter dispense unit 01 module detected yes no				
8133	Jetter_dispense_unit_01_detecting_level	Jetter dispense unit 01 detecting level				
8136	Jetter_dispense_unit_01_module_offset_correction_ X	Jetter dispense unit 01 module offset correction X				
8137	Jetter_dispense_unit_01_module_offset_correction_ Y	Jetter dispense unit 01 module offset correction Y				
8138	Jetter_dispense_unit_01_direct_light_level	Jetter dispense unit 01 direct light level				
8139	Jetter_dispense_unit_01_indirect_light_level	Jetter dispense unit 01 indirect light level				
8209	Jetter_dispense_unit_02_air_pressure	Jetter dispense unit 02 air pressure				
8219	Jetter_dispense_unit_02_X_moving_speed_measure d_max	Jetter dispense unit 02 X moving speed measured max				
8220	Jetter_dispense_unit_02_y_moving_speed_measure d_max	Jetter dispense unit 02 y moving speed measured max				
8223	Jetter_dispense_unit_02_X_work_position_measure d	Jetter dispense unit 02 X work position measured				
8224	Jetter_dispense_unit_02_y_work_position_measure d	Jetter dispense unit 02 y work position measured				
8227	Jetter_dispense_unit_02_counter_pulses	Jetter dispense unit 02 counter pulses				
8229	Jetter_dispense_unit_02_counter_cleaning_cycles	Jetter dispense unit 02 counter cleaning cycles				

8232	Jetter_dispense_unit_02_module_detected_yes_no	Jetter dispense unit 02 module detected yes no				
8233	Jetter_dispense_unit_02_detecting_level	Jetter dispense unit 02 detecting level				
8236	Jetter_dispense_unit_02_module_offset_correction_X	Jetter dispense unit 02 module offset correction X				
8237	Jetter_dispense_unit_02_module_offset_correction_Y	Jetter dispense unit 02 module offset correction Y				
8238	Jetter_dispense_unit_02_direct_light_level	Jetter dispense unit 02 direct light level				
8239	Jetter_dispense_unit_02_indirect_light_level	Jetter dispense unit 02 indirect light level				
8309	Jetter_dispense_unit_03_air_pressure	Jetter dispense unit 03 air pressure				
8319	Jetter_dispense_unit_03_X_moving_speed_measure_d_max	Jetter dispense unit 03 X moving speed measured max				
8320	Jetter_dispense_unit_03_y_moving_speed_measure_d_max	Jetter dispense unit 03 y moving speed measured max				
8323	Jetter_dispense_unit_03_X_work_position_measure_d	Jetter dispense unit 03 X work position measured				
8324	Jetter_dispense_unit_03_y_work_position_measure_d	Jetter dispense unit 03 y work position measured				
8327	Jetter_dispense_unit_03_counter_pulses	Jetter dispense unit 03 counter pulses				
8329	Jetter_dispense_unit_03_counter_cleaning_cycles	Jetter dispense unit 03 counter cleaning cycles				
8332	Jetter_dispense_unit_03_module_detected_yes_no	Jetter dispense unit 03 module detected yes no				
8333	Jetter_dispense_unit_03_detecting_level	Jetter dispense unit 03 detecting level				
8336	Jetter_dispense_unit_03_module_offset_correction_X	Jetter dispense unit 03 module offset correction X				
8337	Jetter_dispense_unit_03_module_offset_correction_Y	Jetter dispense unit 03 module offset correction Y				
8338	Jetter_dispense_unit_03_direct_light_level	Jetter dispense unit 03 direct light level				
8339	Jetter_dispense_unit_03_indirect_light_level	Jetter dispense unit 03 indirect light level				
8409	Jetter_dispense_unit_04_air_pressure	Jetter dispense unit 04 air pressure				
8419	Jetter_dispense_unit_04_X_moving_speed_measure_d_max	Jetter dispense unit 04 X moving speed measured max				
8420	Jetter_dispense_unit_04_y_moving_speed_measure_d_max	Jetter dispense unit 04 y moving speed measured max				
8423	Jetter_dispense_unit_04_X_work_position_measure_d	Jetter dispense unit 04 X work position measured				
8424	Jetter_dispense_unit_04_y_work_position_measure_d	Jetter dispense unit 04 y work position measured				
8427	Jetter_dispense_unit_04_counter_pulses	Jetter dispense unit 04 counter pulses				
8429	Jetter_dispense_unit_04_counter_cleaning_cycles	Jetter dispense unit 04 counter cleaning cycles				
8432	Jetter_dispense_unit_04_module_detected_yes_no	Jetter dispense unit 04 module detected yes no				
8433	Jetter_dispense_unit_04_detecting_level	Jetter dispense unit 04 detecting level				
8436	Jetter_dispense_unit_04_module_offset_correction_X	Jetter dispense unit 04 module offset correction X				
8437	Jetter_dispense_unit_04_module_offset_correction_Y	Jetter dispense unit 04 module offset correction Y				
8438	Jetter_dispense_unit_04_direct_light_level	Jetter dispense unit 04 direct light level				
8439	Jetter_dispense_unit_04_indirect_light_level	Jetter dispense unit 04 indirect light level				
8509	Jetter_dispense_unit_05_air_pressure	Jetter dispense unit 05 air pressure				
8519	Jetter_dispense_unit_05_X_moving_speed_measure_d_max	Jetter dispense unit 05 X moving speed measured max				
8520	Jetter_dispense_unit_05_y_moving_speed_measure_d_max	Jetter dispense unit 05 y moving speed measured max				
8523	Jetter_dispense_unit_05_X_work_position_measure_d	Jetter dispense unit 05 X work position measured				
8524	Jetter_dispense_unit_05_y_work_position_measure_d	Jetter dispense unit 05 y work position measured				
8527	Jetter_dispense_unit_05_counter_pulses	Jetter dispense unit 05 counter pulses				

8529	Jetter_dispense_unit_05_counter_cleaning_cycles	Jetter dispense unit 05 counter cleaning cycles				
8532	Jetter_dispense_unit_05_module_detected_yes_no	Jetter dispense unit 05 module detected yes no				
8533	Jetter_dispense_unit_05_detecting_level	Jetter dispense unit 05 detecting level				
8536	Jetter_dispense_unit_05_module_offset_correction_X	Jetter dispense unit 05 module offset correction X				
8537	Jetter_dispense_unit_05_module_offset_correction_Y	Jetter dispense unit 05 module offset correction Y				
8538	Jetter_dispense_unit_05_direct_light_level	Jetter dispense unit 05 direct light level				
8539	Jetter_dispense_unit_05_indirect_light_level	Jetter dispense unit 05 indirect light level				
8609	Jetter_dispense_unit_06_air_pressure	Jetter dispense unit 06 air pressure				
8619	Jetter_dispense_unit_06_X_moving_speed_measure_d_max	Jetter dispense unit 06 X moving speed measured max				
8620	Jetter_dispense_unit_06_y_moving_speed_measure_d_max	Jetter dispense unit 06 y moving speed measured max				
8623	Jetter_dispense_unit_06_X_work_position_measure_d	Jetter dispense unit 06 X work position measured				
8624	Jetter_dispense_unit_06_y_work_position_measure_d	Jetter dispense unit 06 y work position measured				
8627	Jetter_dispense_unit_06_counter_pulses	Jetter dispense unit 06 counter pulses				
8629	Jetter_dispense_unit_06_counter_cleaning_cycles	Jetter dispense unit 06 counter cleaning cycles				
8632	Jetter_dispense_unit_06_module_detected_yes_no	Jetter dispense unit 06 module detected yes no				
8633	Jetter_dispense_unit_06_detecting_level	Jetter dispense unit 06 detecting level				
8636	Jetter_dispense_unit_06_module_offset_correction_X	Jetter dispense unit 06 module offset correction X				
8637	Jetter_dispense_unit_06_module_offset_correction_Y	Jetter dispense unit 06 module offset correction Y				
8638	Jetter_dispense_unit_06_direct_light_level	Jetter dispense unit 06 direct light level				
8639	Jetter_dispense_unit_06_indirect_light_level	Jetter dispense unit 06 indirect light level				
7453	Jetter_sealing_01_air_pressure	Jetter sealing unit 01 air pressure				
7463	Jetter_sealing_01_X_moving_speed_measured_max	Jetter sealing unit 01 X moving speed measured max				
7464	Jetter_sealing_01_y_moving_speed_measured_max	Jetter sealing unit 01 y moving speed measured max				
7467	Jetter_sealing_01_X_work_position_measured	Jetter sealing unit 01 X work position measured				
7468	Jetter_sealing_01_y_work_position_measured	Jetter sealing unit 01 y work position measured				
7471	Jetter_sealing_01_counter_pulses	Jetter sealing unit 01 counter pulses				
7473	Jetter_sealing_01_counter_cleaning_cycles	Jetter sealing unit 01 counter cleaning cycles				
7476	Jetter_sealing_01_module_detected_yes_no	Jetter sealing unit 01 module detected yes no				
7477	Jetter_sealing_01_detecting_level	Jetter sealing unit 01 detecting level				
7480	Jetter_sealing_01_module_offset_correction_X	Jetter sealing unit 01 module offset correction X				
7481	Jetter_sealing_01_module_offset_correction_Y	Jetter sealing unit 01 module offset correction Y				
7482	Jetter_sealing_01_direct_light_level	Jetter sealing unit 01 direct light level				
7483	Jetter_sealing_01_indirect_light_level	Jetter sealing unit 01 indirect light level				
7553	Jetter_sealing_02_air_pressure	Jetter sealing unit 02 air pressure				
7563	Jetter_sealing_02_X_moving_speed_measured_max	Jetter sealing unit 02 X moving speed measured max				
7564	Jetter_sealing_02_y_moving_speed_measured_max	Jetter sealing unit 02 y moving speed measured max				
7567	Jetter_sealing_02_X_work_position_measured	Jetter sealing unit 02 X work position measured				
7568	Jetter_sealing_02_y_work_position_measured	Jetter sealing unit 02 y work position measured				
7571	Jetter_sealing_02_counter_pulses	Jetter sealing unit 02 counter pulses				
7573	Jetter_sealing_02_counter_cleaning_cycles	Jetter sealing unit 02 counter cleaning cycles				
7576	Jetter_sealing_02_module_detected_yes_no	Jetter sealing unit 02 module detected yes no				

7577	Jetter_sealing_02_detecting_level	Jetter sealing unit 02 detecting level				
7580	Jetter_sealing_02_module_offset_correction_X	Jetter sealing unit 02 module offset correction X				
7581	Jetter_sealing_02_module_offset_correction_Y	Jetter sealing unit 02 module offset correction Y				
7582	Jetter_sealing_02_direct_light_level	Jetter sealing unit 02 direct light level				
7583	Jetter_sealing_02_indirect_light_level	Jetter sealing unit 02 indirect light level				
7653	Jetter_sealing_03_air_pressure	Jetter sealing unit 03 air pressure				
7663	Jetter_sealing_03_X_moving_speed_measured_max	Jetter sealing unit 03 X moving speed measured max				
7664	Jetter_sealing_03_y_moving_speed_measured_max	Jetter sealing unit 03 y moving speed measured max				
7667	Jetter_sealing_03_X_work_position_measured	Jetter sealing unit 03 X work position measured				
7668	Jetter_sealing_03_y_work_position_measured	Jetter sealing unit 03 y work position measured				
7671	Jetter_sealing_03_counter_pulses	Jetter sealing unit 03 counter pulses				
7673	Jetter_sealing_03_counter_cleaning_cycles	Jetter sealing unit 03 counter cleaning cycles				
7676	Jetter_sealing_03_module_detected_yes_no	Jetter sealing unit 03 module detected yes no				
7677	Jetter_sealing_03_detecting_level	Jetter sealing unit 03 detecting level				
7680	Jetter_sealing_03_module_offset_correction_X	Jetter sealing unit 03 module offset correction X				
7681	Jetter_sealing_03_module_offset_correction_Y	Jetter sealing unit 03 module offset correction Y				
7682	Jetter_sealing_03_direct_light_level	Jetter sealing unit 03 direct light level				
7683	Jetter_sealing_03_indirect_light_level	Jetter sealing unit 03 indirect light level				
7753	Jetter_sealing_04_air_pressure	Jetter sealing unit 04 air pressure				
7763	Jetter_sealing_04_X_moving_speed_measured_max	Jetter sealing unit 04 X moving speed measured max				
7764	Jetter_sealing_04_y_moving_speed_measured_max	Jetter sealing unit 04 y moving speed measured max				
7767	Jetter_sealing_04_X_work_position_measured	Jetter sealing unit 04 X work position measured				
7768	Jetter_sealing_04_y_work_position_measured	Jetter sealing unit 04 y work position measured				
7771	Jetter_sealing_04_counter_pulses	Jetter sealing unit 04 counter pulses				
7773	Jetter_sealing_04_counter_cleaning_cycles	Jetter sealing unit 04 counter cleaning cycles				
7776	Jetter_sealing_04_module_detected_yes_no	Jetter sealing unit 04 module detected yes no				
7777	Jetter_sealing_04_detecting_level	Jetter sealing unit 04 detecting level				
7780	Jetter_sealing_04_module_offset_correction_X	Jetter sealing unit 04 module offset correction X				
7781	Jetter_sealing_04_module_offset_correction_Y	Jetter sealing unit 04 module offset correction Y				
7782	Jetter_sealing_04_direct_light_level	Jetter sealing unit 04 direct light level				
7783	Jetter_sealing_04_indirect_light_level	Jetter sealing unit 04 indirect light level				
7853	Jetter_sealing_05_air_pressure	Jetter sealing unit 05 air pressure				
7863	Jetter_sealing_05_X_moving_speed_measured_max	Jetter sealing unit 05 X moving speed measured max				
7864	Jetter_sealing_05_y_moving_speed_measured_max	Jetter sealing unit 05 y moving speed measured max				
7867	Jetter_sealing_05_X_work_position_measured	Jetter sealing unit 05 X work position measured				
7868	Jetter_sealing_05_y_work_position_measured	Jetter sealing unit 05 y work position measured				
7871	Jetter_sealing_05_counter_pulses	Jetter sealing unit 05 counter pulses				
7873	Jetter_sealing_05_counter_cleaning_cycles	Jetter sealing unit 05 counter cleaning cycles				
7876	Jetter_sealing_05_module_detected_yes_no	Jetter sealing unit 05 module detected yes no				
7877	Jetter_sealing_05_detecting_level	Jetter sealing unit 05 detecting level				
7880	Jetter_sealing_05_module_offset_correction_X	Jetter sealing unit 05 module offset correction X				
7881	Jetter_sealing_05_module_offset_correction_Y	Jetter sealing unit 05 module offset correction Y				
7882	Jetter_sealing_05_direct_light_level	Jetter sealing unit 05 direct light level				

7883	Jetter_sealing_05_indirect_light_level	Jetter sealing unit 05 indirect light level				
7953	Jetter_sealing_06_air_pressure	Jetter sealing unit 06 air pressure				
7963	Jetter_sealing_06_X_moving_speed_measured_max	Jetter sealing unit 06 X moving speed measured max				
7964	Jetter_sealing_06_y_moving_speed_measured_max	Jetter sealing unit 06 y moving speed measured max				
7967	Jetter_sealing_06_X_work_position_measured	Jetter sealing unit 06 X work position measured				
7968	Jetter_sealing_06_y_work_position_measured	Jetter sealing unit 06 y work position measured				
7971	Jetter_sealing_06_counter_pulses	Jetter sealing unit 06 counter pulses				
7973	Jetter_sealing_06_counter_cleaning_cycles	Jetter sealing unit 06 counter cleaning cycles				
7976	Jetter_sealing_06_module_detected_yes_no	Jetter sealing unit 06 module detected yes no				
7977	Jetter_sealing_06_detecting_level	Jetter sealing unit 06 detecting level				
7980	Jetter_sealing_06_module_offset_correction_X	Jetter sealing unit 06 module offset correction X				
7981	Jetter_sealing_06_module_offset_correction_Y	Jetter sealing unit 06 module offset correction Y				
7982	Jetter_sealing_06_direct_light_level	Jetter sealing unit 06 direct light level				
7983	Jetter_sealing_06_indirect_light_level	Jetter sealing unit 06 indirect light level				
9000	ExecuteRemoteCommandResponseData	ExecuteRemoteCommandResponseData returned	A			
9001	GetProductsResponseData	GetProductsResponseData returned	A			
9002	SelectProductResponseData	SelectProductResponseData returned	A			
9003	DownloadProductResponseData	DownloadProductResponseData returned	A			
9004	UploadProductResponseData	UploadProductResponseData returned	A			
9005	SetTerminalMessageResponseData	SetTerminalMessageResponseData returned	A			
9006	GetUsersResponseData	GetUsersResponseData returned	A			
9007	GetLoggedInUsersResponseData	GetLoggedInUsersResponseData returned	A			
9008	CreateLotResponseData	CreateLotResponseData returned	A			
9009	GetLotResponseData	GetLotResponseData returned	A			
9010	GetLotsResponseData	GetLotsResponseData returned	A			
9011	UpdateLotResponseData	UpdateLotResponseData returned	A			
9012	DeleteLotResponseData	DeleteLotResponseData returned	A			
9013	RenameProductResponseData	RenameProductResponseData returned	A			
9050	VariableChangedData	VariableChangedData returned	A			
9051	ModuleProcessStateChangedData	ModuleProcessStateChangedData returned	A			
9052	MaterialReceivedData	MaterialReceivedData returned	A			
9053	MaterialProcessedData	MaterialProcessedData returned	A			
9054	MaterialRemovedData	MaterialRemovedData returned	A			
9055	UserLoggedInData	UserLoggedInData returned	A			
9056	UserLoggedOutData	UserLoggedOutData returned	A			
9057	UserCreatedData	UserCreatedData returned	A			
9058	UserDeletedData	UserDeletedData returned	A			
9059	ControlStateChangedData	ControlStateChangedData returned	A			
9060	LotCreatedData	LotCreatedData returned	A			
9061	LotDeletedData	LotDeletedData returned	A			
9062	LotStartedData	LotStartedData returned	A			
9063	LotCompletedData	LotCompletedData returned	A			
9064	LotAbortedData	LotAbortedData returned	A			

9065	LotPausedData	LotPausedData returned	A			
9066	LotResumedData	LotResumedData returned	A			
9067	ProductCreatedData	ProductCreatedData returned	A			
9068	ProductSelectedData	ProductSelectedData returned	A			
9069	ProductDeletedData	ProductDeletedData returned	A			
9070	ProductStoredData	ProductStoredData returned	A			
9071	ProductDownloadedData	ProductDownloadedData returned	A			
9072	OperatorCommandExecutedData	OperatorCommandExecutedData returned	A			
9073	ItemsProcessStartedData	ItemsProcessStartedData returned	A			
9074	ItemsProcessCompletedData	ItemsProcessCompletedData returned	A			
9075	ItemProcessStartedData	ItemProcessStartedData returned	A			
9076	ItemProcessCompletedData	ItemProcessCompletedData returned	A			
9077	LotCompleted_Name	LotCompleted_Name_Data returned	A			
9078	LotCompleted_Count	LotCompleted_Count_Data returned	I4			
9079	LotCompleted_Product	LotCompleted_Product_Data returned	A			
9080	LotCompleted_BadCount	LotCompleted_BadCount_Data returned	I4			
9081	LotCompleted_GoodCount	LotCompleted_GoodCount_Data returned	I4			
9082	LotCompleted_Yield	LotCompleted_Yield_Data returned	F4			
9083	LotCompleted_StartTime	LotCompleted_StartTime_Data returned	A			
9084	LotCompleted_EndTime	LotCompleted_EndTime_Data returned	A			
9085	LotCompleted_AssemblyLotID	LotCompleted_AssemblyLotID_Data returned	A			
9086	LotCompleted_AssemblyLotQty	LotCompleted_AssemblyLotQty_Data returned	I4			
9087	LotCompleted_AssemblyLotRejects	LotCompleted_AssemblyLotRejects_Data returned	L			
9088	MaterialReport_LotName	MaterialReport_LotName_Data returned	A			
9089	MaterialReport_AssemblyLotID	MaterialReport_AssemblyLotID_Data returned	A			
9090	MaterialReport_MaterialId	MaterialReport_MaterialId_Data returned	A			
9091	MaterialReport_MaterialConsumption	MaterialReport_MaterialConsumption_Data returned	A			
9092	MaterialReport_LGAREjects	MaterialReport_LGAREjects_Data returned	L			
9093	LotCompleted_AssemblyLotRejects_Val	LotCompleted_AssemblyLotRejects_Val_Data returned	L			
9094	MaterialReport_LGAREjects_Val	MaterialReport_LGAREjects_Val_Data returned	L			
9095	ItemCompletedData	ItemCompletedData_Data returned	I4			

## ALL STATUS VARIABLES

SVID	Variable Name	Description	Type	Min	Max	Default Value
2004	Clock	The value of the equipment's internal clock	A			
2008	MDLN	Equipment model type up to 20 characters	A			MODEL
2009	PPExecName	Currently selected process program (recipe)	A			
2015	SOFTREV	Equipment software revision ID up to 20 characters	A			00.01
2026	ALARMSENABLED	List of all enabled ALID.	L			
2027	ALARMSSET	List of all SET ALID.	L			
2028	CONTROLSTATE	State of the Control State Machine	U1	0	5	4
2029	EVENTSENABLED	List of all enabled CEID.	L			
2030	PreviousProcessState	Previous Processing State Machine state.	U1	0	255	
2031	ProcessState	Current Processing State Machine state.	U1	0	255	
2032	ProcessStateString	Name of the current Processing State Machine state.	A			
2033	ControlStateSwitch	The GEM local/remote control switch	U4	0	1	0
2034	CtrlOnlineSwitch	The GEM online/offline control switch	U4	0	1	1
2035	CommEnableSwitch	The GEM communications enable/disable operator switch	U4			256
2036	CommState	The current state of the GEM communications state machine	U4			260
2037	SpoolState	The current state of the GEM spooling state machine	U4			0
2039	NVSPath	Non-volatile storage directory.	A			TBD
2040	RecipeHandling	Process program (recipe) handling type (0-None 1-File-Based 2-Value-Based)	U4	0	2	1
2041	RecipeType	Process program (recipe) format (0-binary 1-ASCII)	U4	0	1	1
2042	RecipePath	Process program (recipe) storage directory	A			TBD
2043	GEMEnable	Enable GEM features	Bo	0	1	1
2044	RemoteCmdEnable	Enable remote command handling	Bo	0	1	1
2045	HostPPEnable	Enable process program manipulation	Bo	0	1	1
2046	ECSetEnable	Enable EC setting	Bo	0	1	1
2047	HostTermMsgEnable	enable terminal services setting	Bo	0	1	1
2048	RecipeExtension	Process program(recipe) file extension	A			*

2050	Aser	The alarm state change count since startup.	U4			0
2051	Time	Equipment computer date and time	A			
2054	AlarmState	State of the alarm that last changed state since startup	U1			
2055	CEDescription	description of the last collection event triggered	U4			
2056	PPFormat	Indicates the type or types of process programs and recipes that are supported	U1	1	16	1
2057	ResyncNVS	1 – resynchronize EVENTSENABLED and ALARMSENABLED 0 – do not resynchronize	U1			1
4030	PreviousControlState	The previous Control State	U1			
4050	ALIDInputFormat	allowed data type for alarm ids (ALID) in SECS-II messages from host	U4			
4051	CEIDInputFormat	allowed data type for collection event ids (CEID) in SECS-II messages from host	U4			
4052	DATAIDInputFormat	allowed data type for data ids (DATAID) in SECS-II messages from host	U4			
4053	RPTIDInputFormat	allowed data type for report ids (RPTID) in SECS-II messages from host	U4			
4054	TRIDInputFormat	allowed data type for trace ids (TRID) in SECS-II messages from host	U4			
4055	VIDInputFormat	allowed data type for variable (EC SV DV) vids (VID SVID DVID SVID ECID) in SECS-II messages from host	U4			
4916	TimeMM	time format MM/DD/YY hh:mm:ss.	A			
10001	lot_ID	Logistics: Lot user input lot ID				
10006	equipment_ID	Logistics: Lot equipment equipment ID				
10007	software_version	Logistics: Lot equipment software version				
10008	operator_name	Logistics: Lot equipment operator name ???				
10010	tape_data	Logistics: Material user input tape data (from Camstar label)				
10011	epoxy_data	Logistics: Material user input epoxy data (from Camstar label)				
10012	sealing_data	Logistics: Material user input sealing data (from Camstar label)				
10013	LGA_batch_data	Logistics: Material user input LGA batch data (from Camstar label)				
10014	silicon_paper_data	Logistics: Material user input silicon paper data (from Camstar label)				
10016	curing_thermode_ID	Logistics: Tooling user input curing thermode ID				
10017	jetter_ID	Logistics: Tooling user input jetter ID (each Jetter)				
10018	test_equipment_ID	Logistics: Tooling user input test equipment ID				
10019	downset_tool_ID	Logistics: Tooling user input downset tool ID				
10020	punch_tool_ID	Logistics: Tooling user input punch tool ID				
10021	pick_tool_type	Logistics: Tooling user input pick tool type				



10183	curing_force_profile_one_curing_cycle	Pin Curing station sensor curing force profile one curing cycle				
10347	calibration_for_track_1	Module height measurement calibration for track 1				
10348	calibration_for_track_2	Module height measurement calibration for track 2				
10083	Input_detecting_level_spec_min	Input bad hole detection unit detecting level spec min				
10084	Input_detecting_level_spec_max	Input bad hole detection unit detecting level spec max				
10155	Dispense_AOI_detecting_level_spec_min_each_programmed_area	Dispense AOI detecting level spec min each programmed area				
10156	Dispense_AOI_detecting_level_spec_max_each_programmed_area	Dispense AOI detecting level spec max each programmed area				
10172	Post_bond_detecting_level_spec_min_each_programmed_area	Post-Bond Inspection detecting level spec min each programmed area				
10173	Post_bond_detecting_level_spec_max_each_programmed_area	Post-Bond Inspection detecting level spec max each programmed area				
10299	Sealing_AOI_detecting_level_spec_min_each_programmed_area	Sealing AOI detecting level spec min each programmed area				
10300	SEALING_AOI_detecting_level_spec_max_each_programmed_area	Sealing AOI detecting level spec max each programmed area				
10329	VI_assembly_detecting_level_spec_min_each_programmed_area	VI module (assembly side) detecting level spec min each programmed area				
10330	VI_assemblydetecting_level_spec_max_each_programmed_area	VI module (assembly side) detecting level spec max each programmed area				
10337	VI_module_detecting_level_spec_min_each_programmed_area	VI module (ISO side) detecting level spec min each programmed area				
10338	VI_module_detecting_level_spec_max_each_programmed_area	VI module (ISO side) detecting level spec max each programmed area				
11128	Jetter_dispense_01_Z_calibration_sensor_dispense	Jetter dispense unit 01 sensor Z calibration sensor				
11134	Jetter_dispense_01_detecting_level_spec_min	Jetter dispense unit 01 detecting level spec. min				
11135	Jetter_dispense_01_detecting_level_spec_max	Jetter dispense unit 01 detecting level spec. max				
11228	Jetter_dispense_02_Z_calibration_sensor_dispense	Jetter dispense unit 02 sensor Z calibration sensor				
11234	Jetter_dispense_02_detecting_level_spec_min	Jetter dispense unit 02 detecting level spec. min				
11235	Jetter_dispense_02_detecting_level_spec_max	Jetter dispense unit 02 detecting level spec. max				
11328	Jetter_dispense_03_Z_calibration_sensor_dispense	Jetter dispense unit 03 sensor Z calibration sensor				
11334	Jetter_dispense_03_detecting_level_spec_min	Jetter dispense unit 03 detecting level spec. min				
11335	Jetter_dispense_03_detecting_level_spec_max	Jetter dispense unit 03 detecting level spec. max				
11428	Jetter_dispense_04_Z_calibration_sensor_dispense	Jetter dispense unit 04 sensor Z calibration sensor				
11434	Jetter_dispense_04_detecting_level_spec_min	Jetter dispense unit 04 detecting level spec. min				
11435	Jetter_dispense_04_detecting_level_spec_max	Jetter dispense unit 04 detecting level spec. max				
11528	Jetter_dispense_05_Z_calibration_sensor_dispense	Jetter dispense unit 05 sensor Z calibration sensor				
11534	Jetter_dispense_05_detecting_level_spec_min	Jetter dispense unit 05 detecting level spec. min				
11535	Jetter_dispense_05_detecting_level_spec_max	Jetter dispense unit 05 detecting level spec. max				
11628	Jetter_dispense_06_Z_calibration_sensor_dispense	Jetter dispense unit 06 sensor Z calibration sensor				
11634	Jetter_dispense_06_detecting_level_spec_min	Jetter dispense unit 06 detecting level spec. min				
11635	Jetter_dispense_06_detecting_level_spec_max	Jetter dispense unit 06 detecting level spec. max				
10272	Jetter_sealing_01_Z_calibration_sensor_sealing	Jetter sealing unit 01 sensor Z calibration sensor				
10278	Jetter_sealing_01_detecting_level_spec_min	Jetter sealing unit 01 detecting level spec. min				
10279	Jetter_sealing_01_detecting_level_spec_max	Jetter sealing unit 01 detecting level spec. max				
10372	Jetter_sealing_02_Z_calibration_sensor_sealing	Jetter sealing unit 02 sensor Z calibration sensor				
10378	Jetter_sealing_02_detecting_level_spec_min	Jetter sealing unit 02 detecting level spec. min				

[illegible]

## ALL ALARMS

HAFR: Please note: Alarms in the list below need to be defined in accordance with DB-Matik machine software

Alarm Name	AlarmID	Alarm Set Event	Alarm Clear Event	Description
Example	3002	300200	300201	Glue is empty
xxxxxxxx	xxxxx	xxx		xxxxx

