群翊工業



GP Automation Software

SECS/GEM Interface Document Version 1.08

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# - Introduction

This document is intended for software developers creating Host applications that communicate with the Equipment, and describes the Equipment‟s compliance with the SEMI Standards E4, E5, E30, E37 and E37.1.

These capabilities are implemented on the Equipment using the GP Automation from Group Up Industrial Corporation.

## Changes to this Document

|  |  |  |
| --- | --- | --- |
| ***Version*** | ***Date*** | ***Description*** |
| 1.00 | 2020/06/23 | First Edition |
| 1.01 | 2020/06/30 | 修正部份VIDs、CEIDs 的名稱定義和文章排版 |
| 1.02 | 2020/07/22 | 新增 CH3.8 Equipment Terminal Services 和Stream10 格式說明 |
| 1.03 | 2020/07/23 | 新增 CH3.11 Material Movement 和 CH4. Lot Management |
| 1.04 | 2020/09/26 | ID List 全面修改，架構改為單一 SECS/GEM 連接兩台烤箱；修改配方結構和各值上下限，修改 RemoteCommand 參數 |
| 1.05 | 2020/11/11 | 調整 CEID,Alarm; 移除 S7F3, S7F5 相關說明和功能; 新增 7.1Process  Scenario |
| 1.06 | 2020/11/24 | 更新 Remote Command  更新 SVID(1000)、SVID(1001) 、SVID(2000) 、SVID(2001)描述 |
| 1.07 | 2023/11/01 | 修改需要的的 alarm list 與PPSELECT 格式 |
| 1.08 | 2023/11/30 | 修改REMOTE指令格式 |

## Host Communication

The Host communication interface implements SECS-I and HSMS message service. This HSMS implementation complies with the SEMI E37-0303 High-Speed SECS Message Services (HSMS) Generic Services standard.

### Physical Connector

* + - 1. **SECS-I Physical Connection**

The following set values are used as circuit parameters:

|  |  |
| --- | --- |
| ***Item*** | ***Description*** |
| Electrical I/F | EIA RS-232-C complied |
| Connector | ISO 2110-1980(D-sub) 25pin [FEMALE] |
| Connector location | The connector is wired from thecommunication board (IBX4101) tooutside of the equipment using twoextension cables (length: 5m). |
| Signal pins | Pin # Description   1. shield 2. data transmit (output) 3. data receive (input) 7 signal ground |
| Data rate | 9600 bps (changeable) [300-19200] |
| Characters | Start bit = 1bit  Data bit = 8bit (LSB-MSB) Stop bit = 1bit  Parity bit = none |

* + - 1. **HSMS Physical Connection**

|  |  |
| --- | --- |
| *Item* | *Description* |
| Electrical I/F | IEEE 802.3 complied |
| Connector | 10Bast-T |
| Connector location | The 10Base-T connector is located on the network communication board, which is mounted on the equipment controller. |

### Message Content

The GP Automation implements SECS-II message content as required to support GEM services described in the SEMI E30-0611 standard.

## SEMI E37-0303 – HSMS Standard

### Default HSMS Parameters

The Equipment is configured at the PASSIVE ENTITY and provides the following HSMS configuration parameters, with installation default values shown. The HSMS parameters can be configured using Host configuration screen.

|  |  |  |
| --- | --- | --- |
| ***Parameter*** | ***Default*** | ***Description*** |
| Remote IP | 0.0.0.0 | Host IP address for TCP/IP. |
| Remote Port | 5001 | Host TCP/IP port. |
| T3 | 45 Sec. | Reply timeout. Determines how long the Equipment will wait for a reply from the Host. Range: 1-120 seconds. This value may need to be increased if there is heavy network use. |
| T5 | 60 Sec. | Connect Separation timeout. Used to prevent excessive TCP/IP connect activity by providing a minimum time between the breaking. |
| T6 | 5 Sec. | Control Message timeout. Determines how long the Equipment will wait for a reply to an HSMS control message from the Host. The value should always be less than T3. This value may need to be increased if there is heavy network use. |
| T7 | 10 Sec. | Connect timeout. Determines how long the Equipment will maintain an open TCP/IP connection before receiving an HSMS connect request from the ACTIVE ENTITY. This value may need to be increased if there is heavy network use. |
| T8 | 5 Sec. | Data Receive timeout. Determines how long the Equipment will wait after receiving some portion of an HSMS message to receive the next data block. |

## SEMI E5-0708 - SECS-II Messaging Standard

The GP Automation uses the following SECS-II conventions:

**Data Format Types**

Where the Standards permit a choice of data item types, the choice has been made as described in section "Message Detail".

For outgoing messages, the Equipment always sends Data Items of the exact format shown. For some incoming messages, the Equipment "forgives" minor Host errors. For example, the Equipment may accept a U1 Data Item where a U2 format was expected. We recommend the Host attempt to use the formats shown.

**Data Item Length Bytes**

For messages sent by the Equipment, the number of length bytes in Data Items is always the minimum required to contain the Data Item length.

For messages received from the Host, the number of length bytes in Data Items can be 1, 2, or 3, provided that the length parameter can accurately be specified.

**ASCII Data**

Unless otherwise specified, all ASCII data items must contain printable ASCII data -- that is, characters in the range 0x20 to 0x7E.

**Multi-Block Messages**

Wherever the Host is supposed to send a single-block message, this Equipment will also accept multi-block format.

**Function Zero**

The Equipment sends a Reply Message using Function zero (F0) according to the requirements of the GEM Control State.

Wherever this Equipment expects a Reply message from the Host, the Host can send F0. The Equipment will instantly abort the outstanding transaction. The Equipment will not take any additional action.

## Terminology

The following terms are used throughout the document to refer to the various entities interfacing with the Equipment:

|  |  |
| --- | --- |
| **Equipment** | GOLH-710PXAWS |
| **Operator** | The person who physically has access to the equipment's material port(s) and control panel. |
| **Host** | The computer which is connected to the equipment via the SECS interface |
| **ALID** | Equipment Alarm ID |
| **CEID** | Collection Event ID |
| **DV** | Data Variable |
| **EC** | Equipment Constants |
| **GEM** | Generic Equipment Model |
| **PP** | Process Program |
| **SV** | Status Variable |
| **VID** | Variable ID |

## State Diagram Conventions

This document uses several ***Finite State Machine*** diagrams to describe the current condition of the Equipment's SECS link, material handling mechanisms, and process cycle. Each Finite State Machine diagram includes a State Diagram and a complete description of the states and state transitions.

All Finite State Diagrams have been prepared in the format specified in the GEM standard. This notation is required as a fundamental part of GEM compliance and must be included in the Equipment SECS Interface Documentation. This notation is the "State chart" notation developed by David Harel.

The following are the major characteristics of this notation as it is used in this document:

1. Each state is represented by a rectangle with rounded corners.
2. A collection of sub-states may be grouped into a super-state.
3. The entity described by the diagrams will be in one and only one of the sub-states at all times.
4. Variables representing the current state of an entity do not contain values for super-states, only the lowest sub-state is represented.
5. State transitions are shown using single-headed arrows.
6. Each state transition is a Collection Event, and it has a unique Collection Event ID (CEID)
7. An arrow directly from a super-state to another state describes a Collection Event that can occur while the entity is in any one of the sub-states contained in the super-state.
8. An arrow directly into a super-state to the H\* (history) symbol describes a transition to the lowest sub-state which described the entity just before the transition out of the super-state.
9. An arrow directly into a super-state to the C (conditional) symbol describes a transition to a particular sub-state based on some other relevant data. The conditional data is not represented in the diagram but is described in the associated text.

# - SEMI Standards Compliance

The Equipment supports the following capabilities, as described in the various SEMI standards.

## Supported SEMI Standards

|  |  |  |
| --- | --- | --- |
| ***Standard*** | ***Version*** | ***Description*** |
| E4 | 0699 | SECE-I |
| E5 | 1107 | SECS-II |
| E30 | 0520 | GEM |
| E37, E37.1 | 0303, 0702 | HSMS, HSMS-SS |
| A3 | 0819 | PCBECI |

## GEM Compliance

The following table indicates the services implemented in the GP Automation software.

These services are configured for the Host to support the required GEM-based operating scenarios.

|  |  |  |
| --- | --- | --- |
| ***Fundamental GEM Requirements*** | ***Implemented*** | ***GEM Compliant*** |
| State Models | * Yes  No | * Yes  No |
| Equipment Processing States | * Yes  No | * Yes  No |
| Host-Initiated S1F13/14 Scenario | * Yes  No | * Yes  No |
| Event Notification | * Yes  No | * Yes  No |
| On-Line Identification | * Yes  No | * Yes  No |
| Error Messages | * Yes  No | * Yes  No |
| Documentation | * Yes  No | * Yes  No |
| Control (Operator Initiated) | * Yes  No | * Yes  No |
| ***Additional Capabilities*** | ***Implemented*** | ***GEM Compliant*** |
| Establish Communications | * Yes  No | * Yes  No |
| Dynamic Event Report Configuration | * Yes  No | * Yes  No |
| Variable Data Collection | * Yes  No | * Yes  No |
| Trace Data Collection | * Yes  No | * Yes  No |
| Status Data Collection | * Yes  No | * Yes  No |
| Alarm Management | * Yes  No | * Yes  No |
| Remote Control | * Yes  No | * Yes  No |
| Equipment Constants | * Yes  No | * Yes  No |
| Process Program Management | * Yes  No | * Yes  No |
| Material Movement | * Yes  No | * Yes  No |
| Equipment Terminal Services | * Yes  No | * Yes  No |
| Clock | * Yes  No | * Yes  No |
| Limits Monitoring |  Yes ■ No |  Yes ■ No |
| Spooling | Yes ■ No |  Yes ■ No |
| Control (Host-Initiated) | * Yes  No | * Yes  No |

# - GEM Capabilities

This section describes the working characteristics of the Equipment. It is divided into subsections, each of which describes a particular aspect of the Equipment's GEM operating characteristics.

## Establish Communications

The Communications State Model defines the behavior of the Equipment in relation to the existence or absence of a communications link with the Host. This model pertains to a logical connection between Equipment and Host rather than a physical connection.

### Communications State Transitions



**Communications State Diagram**

1.

**D isabled**

C

2.

3.

**Enabled**

4.

**Not**

**Com m unicating**

5.

6.

**Com m unicating**

The following transitions can occur. Transitions of the Communication Finite State Machine diagram do not cause the Equipment to signal any Collection Event ID (CEID), nor to send Event Reports to the Host.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **#** | **From** | **Trigger** | **To** | **Description** |
| 1 | Unknown | Power-Up | Conditional | Equipment will initialize itself to either the Disabled or Enabled state, depending on the configuration of the EC *GemInitCommState.* |
| 2 | Disabled | Operator switchs from ENABLE to DISABLE. | Enabled | Equipment will attempt to establish communica-tions with  the Host. The Equipment will periodically send a Connect Request at an interval dictated by the EC *GemEstabCommDelay*. |
| 3 | Enabled | Operator switchs from DISABLE to ENABLE. | Disabled | Communications are abruptly terminated. Any outstanding messages queued for send are discarded. The Equip- ment will not respond to a Host-initiated ENQ. |
| 4 | Disabled or Power-Up | Request has been made for the Equipment to start communicating. | Not Communicating | Equipment immediately attempts to establish communications with the Host. The Equipment will periodically send a Connect Request message at an interval dictated by the EC *GemEstabCommDelay*. |
| 5 | Not Communicating | Successful completion of Connect Request trans- action. | Communicating | The Host / Equipment link is "up". Normal SECS trans- actions can occur. |
| 6 | Communicating | A communications failure has occurred. | Not Communicating | Equipment immediately attempts to establish communi- cations with the Host. The Equipment will periodically send a Connect Request message at an interval dictated by the EC *GemEstabCommDelay.* |

### Communications States

The current Communication State will be one of the following values.The communication State is presented to the Operator on the main Operator Interface screen.

**DISABLED** -- The SECS link to the Host is disabled at the Equipment. The Equipment will send no messages to the Host. The Equipment will not respond to a Host-initiated ENQ.

**ENABLED** -- When communications are Enabled, the Equipment's intention is to be in communication with the Host. Whether or not the Equipment is currently communicat-ing with the Host determines which sub-state the Equipment is in: Communicating or Not Communicating.

**COMMUNICATING** -- The SECS link between the Equipment and the Host is operating normally.

If the Equipment encounters a SECS-I Retry Limit (RTY) error when attempting to send a block to the Host, it discards any messages queued for send and the communication state transits to ENABLED.

**NOT COMMUNICATING** -- The SECS link to the Host is enabled at the Equipment, and the Equipment is attempting to determine if the link is active. The Equipment periodically sends S1F13 (Establish Communications Request).

If the connect is not successful for any reason, the Equipment will try again periodically forever. The time between attempts is controlled by the Equipment Constant *GemEstabCommDelay*.

Once the Host has responded with S1F14 (Establish Communications Acknowledge), the Communication State will change to COMMUNICATING.

The Host can also attempt to establish communications by sending S1F13. The Equipment will accept the message and respond with S1F14 and the Communication State will change to COMMUNICATING.

In ENABLED state, the Equipment will accept messages from the Host, but will ignore any messages except S1F13 and S1F14. The Equipment will respond to the S1F13 while the Communication State is ENABLED or COMMUNICATING, but it will not send S1F13 once communications have been established

### Power Up

At Power Up (or System Start), the Equipment Constant *GemInitCommState* controls whether state is initialized to DISABLED or ENABLED. The default setting is ENABLED.

### Related Variables

The following table lists the variables (SV's, EC's, or DVVALS) which are relevant to establishing communications. For the Equipment-specific VIDS for these variables, see chapter 6, Variable Item Dictionary.

**GemInitCommState EC U1**

Initial (power-up) Communications State. (Default, 1)

* **0 = Disabled**
* **1 = Enabled**

**GemEstabCommDelay EC U2**

Time in seconds of how long the Equipment will delay after an unsuccessful Connect Request before sending another. Valid values are 10-65535. Units = s (Default: 10)

### Establish Communications Scenarios

Unless otherwise noted in this section, the Communications State is "Commu-nicating" and the Control state is either "On-Line/Local" or "On-Line/Remote".

* + - 1. **Equipment Establishes Communications**

Assumption:Equipment's Communication state is "Enabled/Not Communicating".

|  |  |  |
| --- | --- | --- |
| ***#*** | **SECS Message** | ***Description*** |
| 1. | H <- E S1F13 | The equipment sends an “Establish Communications Request” command. |
| 2. |  | If the send is not successful, or if no reply is received from the Host, wait "*GemEstabCommDelay*” seconds, then go to step 1. |
| 3. | H -> E S1F14 | The Host responds with Establish Communications Acknowledge. If COMMACK in this message is non-zero, wait "GemEstabCommDelay” seconds, then go to step 1. If COMMACK is zero, proceed to the next step. |
| 4. |  | Communications is successfully established. The Equipment changes its communication state to Communicating. Normal SECS message processing begins. |

* + - 1. **Host Establishes Communications**

Assumption:Equipment's Communication state is either "Enabled/Not Communicating" or

|  |  |  |
| --- | --- | --- |
| ***#*** | ***SECS Message*** | ***Description*** |
| 1. | H -> E S1F13 W | Host sends Establish Communications Request. |
| 2. | H <- E S1F14 | The Equipment responds with Establish Communications Acknowledge, with COMMACK set to zero. After this message is successfully sent, communications is established. If the current communication state is "Not Communicating", the Equipment changes its communication state to "Communicating". If the state is "Communicating", no change in communication state occurs. In either case, subsequently received messages are processed normally. |

"Enabled/Communicating".

* + - 1. **Simultaneous Establish Communications**

sumption:Equipment's Communication state is "Enabled/Not Communicating".

|  |  |  |
| --- | --- | --- |
| ***#*** | ***SECS Message*** | ***Description*** |
| 1. | H <- E S1F13 W | Equipment sends Establish Communications Request. |
| 2. | H -> E S1F13W | Host sends Establish Communications Request. |
| 3. | H <- E S1F14 | The Equipment responds with Establish Communications Acknowledge, with COMMACK set to zero. After this message is successfully sent, communications is established. The Equipment changes its communication state to Communicating. |
| 4. | H -> E S1F14 | The Host responds with Establish Communications Acknowledge, with COMMACK set to zero. This step could occur before step 3, in which case communications would be established at this step. |

* + - 1. **Losing Connection, Re-Connecting**

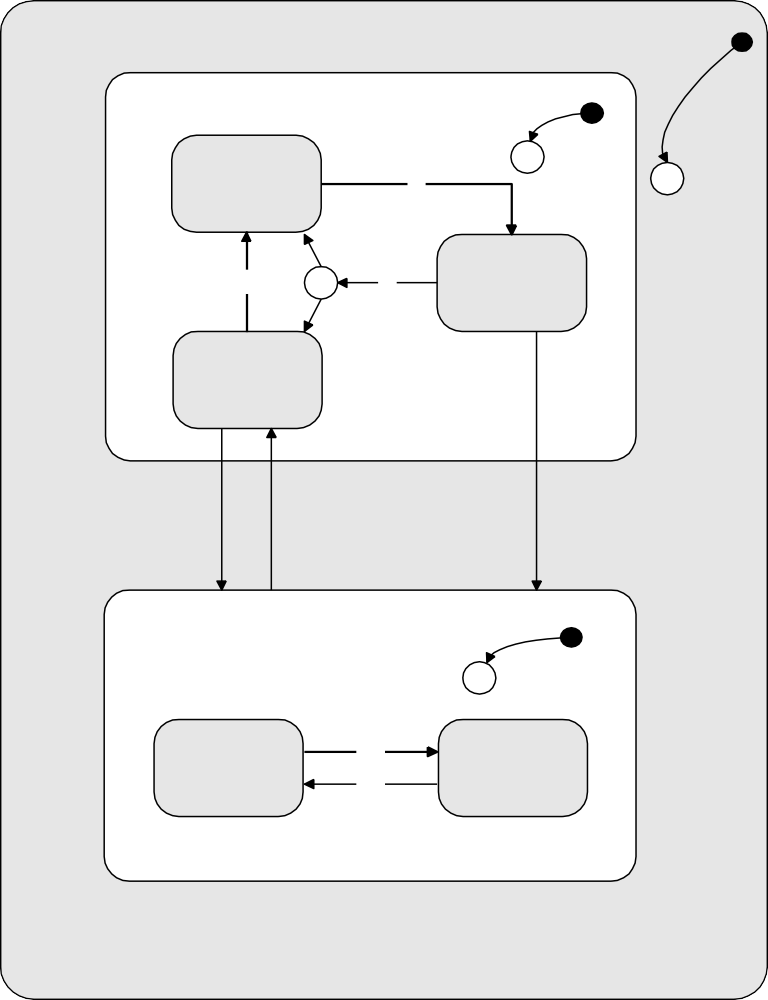
|  |  |  |
| --- | --- | --- |
| ***#*** | ***SECS Message*** | ***Description*** |
| 1. | H <- E SxFy | Any Message. The Equipment encounters SECS block transmission errors while attempting to send a message to the Host, and reaches its Retry Limit (RTY). The Equipment considers the SECS link as disconnected. |
| 2. | H <-E S1F13W | Connect Request. The Equipment attempts to re-establish the link. |
| 3. |  | If the send is not successful, or if no reply is received from the Host, the Equipment waits for "GemEstabCommDelay" seconds and then goes back to step 2. |
| 4. | H -> E S1F14 | The Host acknowledges, sending COMMACK of "0". The link is now re-connected. |

## Control

The Control State Model describes the level of cooperation between the Host and Equipment. This model specifies Operator interaction at different levels of Host control. While the Communications state model addresses the ability for the Host and Equipment to exchange messages, the Control Model addresses the Equipment‟s responsibility to act upon the messages it receives.

### Control State Transitions

The control state is given by the Status Variable *GemControlState*. The Equipment behaves differently and will accept different messages depending on its current control state. The purpose of this diagram is to make clear to the Host exactly what is happening at the Equipment. The logic for these states and transitions is specified in the GEM standard.



**Equipment Control States**

**Off-Line**

1.

2.

14.

**Equipment Off- Line**

C

3.

C

5.

7.

C

6.

4.

**A ttempt On- Line**

**H ost Off- Line**

10.

9.

8.

**On-Line**

11.

C

**Local**

12.

13.

**R emote**

Certain state transitions will cause a collection event to be signaled. If the event is enabled, this event will be sent to the Host along with the appropriate reports if appropriate. This table lists the state transitions and notes when events will be sent to the Host.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ***#*** | ***From*** | ***Trigger*** | ***To*** | ***Description*** |
| 1 | Unknown | Power-Up | Conditional | This transition is made to either the Off-Line or On-Line state, depending on the EC *GemInitControlState.* |
| 2 | Unknown | Power-Up | Conditional | This conditional transition is governed by the value of the *GemOffLineSubstate* EC. |
| 3 | Equipment Off-Line | Operator requests to go On- Line | Attempt On-Line | The Equipment will immediately send an S1F1 to request to go On-Line. |
| 4 | Attempt On-Line | Unsuccessful On-Line request | Conditional | This transition occurred because the Host did not reply to an S1F1 with an S1F2 or because the S1F1 was not successfully sent. |
| 5 | Conditional | *ONLINEFAILED*  Equipment Constant configur- ed to Equipment Off-Line. | Equipment Off-Line | Equipment will allow the Operator to attempt to go On-Line again. |
| 6 | Conditional | ONLINEFAILED Equipment Constant con-figured to Host Off-Line. | Host Off-Line | The Equipment will accept a Host initiated re- quest to go On-Line by replying to the S1F17 with ONLACK = 0x00. |
| 7 | Host Off-Line | Operator requests to go Off- Line | Equipment Off-Line | A Host request to go On-Line will not be accept- ed. |
| 8 | Attempt On-Line | Successful On-Line request. | On-Line | The Equipment is now On-Line. |
| 9 | On-Line | Host puts the Equipment Off- Line by sending S1F15 and receiving the S1F16 with OFLACK= 0x00. | Host Off-Line | EVENT: *GemEqpOffLine*. The Equipment will accept a Host initiated request to go On-Line by replying to the S1F17with ONLACK= 0x00. |
| 10 | Host Off-Line | Successful completion of S1F17 / S1F18 transaction with ONLACK = 0x00. | On-Line | The Equipment is now On-Line. |
| 11 | Unknown | Entry into On-Line super- state. | Conditional  (Local or Remote) | EVENT: *GemControlStateLocal* or *GemControlStateRemote*. The Equip-ment will transition to whichever state is specified in the EC GemOnLineSubstate. |
| 12 | Local | Operator requests to go Remote. | Remote | EVENT: *GemControlStateRemote*. All documented messages will be accepted in this state, including remote commands. |
| 13 | Remote | Operator requests to go Local. | Local | EVENT: *GemControlStateLocal*. Remote commands will be rejected. |
| 14 | On-Line | Operator requests to go Off- Line. | Equipment Off-Line | EVENT: *GemEqpOffLine*. A Host request to go On-Line will not be accepted. |

* + - 1. **Control States**

The variable *GemControlState* represents the current control state, and will be one of the following values:

**Off-Line/EQUIPMENT OFF-LINE** -- The Operator has put the Equipment Off-Line. In this state, the Host may not put the Equipment On-Line, only the Operator can attempt this from this state. Any Host-initiated primary message (except S1F13 and S1F17) will be replied to with an S*n*F0 ABORT message from the Equipment. The Equipment will not send any primary messages except for S1F13 when necessary to establish communications, and the S9F1 and S9F9 messages for SECS errors.

**Off-Line/HOST OFF-LINE** -- While in this state, the Equipment will accept either the S1F17 (Go Online), or the S1F13 (Connect Request) message. When in this state, the Operator has allowed the Host to put the Equipment On-Line, but the Host has not yet done so, or the Host has just put the Equipment Off-Line by sending S1F15. The Host may request the Equipment to come On-Line by sending the S1F17 Go Online message. The Operator cannot put the Equipment On-Line from this state.

The S1F13/S1F14 messages are used to maintain the Communications Finite State Machine. All messages (except S1F13 and S1F17) received will be replied to with the S*n*F0 ABORT message. The Equipment will not send any primary messages except for S1F13 when necessary to establish communications, and the S9F1 and S9F9 messages for SECS errors.

**Off-Line/ATTEMPT ON-LINE** -- The Operator has requested that the Equip-ment go On-Line, causing the transition to this state. The Equipment sends a single S1F1, indicating its desire to go On-Line. When either a transmission failure (here, T3 or RTY errors) occurs, or a successful reply to the S1F1 has been received, a transmission is made out of this state.

**On-Line/LOCAL** -- In LOCAL mode, the Equipment continues to send Event and Alarm reports to the Host. The Host can monitor operations, but cannot con-trol processing. However, the Host can still exert "controls" other than S2F41 which do not directly affect processing. For example, the Host can enable/dis-able Alarms and set the Clock.

**On-Line/REMOTE** -- The remote Host Computer has control of the Equipment, so that it can issue specific remote commands through the S2F41 (Remote Command) message. For the list of remote commands supported by this Equipment, see section 3.6, Remote Commands.

### Power Up

At Power Up, the Equipment Constant *GemInitControlState* controls whether Control State is initialized to ONLINE or OFFLINE. Within the Off-Line super-state, the Equipment Constant *GemOffLineSubstate* controls whether the Control State defaults to:

* **1 = Equipment Off-Line**
* **2 = Attempt On-Line**
* **3 = Host Off-Line**

If *GemInitControlState* initializes to On-Line, the variable GemOnLineSubstate determines whether the default state is:

* **4 = Local**
* **5 = Remote**

### Related Variables

The following variables (SV's, EC's, or DVVALS) are relevant to the Control State. For the Equipment-specific VIDS for these variables, see chapter 7, Variable Item Dictionary.

|  |  |  |
| --- | --- | --- |
| **GemInitControlState** | **EC** | **U1** |
| Initial (power-up) control super-state.   * **1 = Off-Line** |  |  |
| * **2 = On-Line** |  |  |
| **GemOffLineSubstate** | **EC** | **U1** |

The default (power-up) offline substate of the Control State Model.

* **1 = Equipment Off-Line**
* **2 = Attempt On-Line**
* **3 = Host Off-Line**

**GemOnLineFailed EC U1**

The default Control State transition when Attempt On-Line fails.

* **1 = Equipment Off-Line**
* **3 = Host Off-Line**

**GemOnLineSubstate EC U1**

Set internally to direct the system into the correct online state based on the current status of the hardware. If material is found in the tool, the system will set this constant to startup in online/local mode. The Host should not change this value. The Host can request local or remote on startup by changing the value of the *GemOnLineSubstate* constant. (Default: 5)

* **4 = On-Line/Local**
* **5 = On-Line/Remote**

|  |  |  |
| --- | --- | --- |
| **GemControlState** | **SV** | **U1** |
| The current Control State.   * **1 = Off-Line/Equipment Off-Line** |  |  |
| * **2 = Off-Line/Attempt On-Line** |  |  |
| * **3 = Off-Line/Host Off-Line** |  |  |
| * **4 = On-Line/Local** |  |  |
| * **5 = On-Line/Remote** |  |  |

**GemPreviousControlState SV U1**

The Control State in effect before the most recent transition to the current Control State.

* **1 = Off-Line/Equipment Off-Line**
* **2 = On-Line/Local**
* **3 = On-Line/Remote**

### Related Events

The following lists the collection events (CEIDs) which are relevant to the Control State.

**GemEqpOffLine**

This event signals a transition to a control state of offline.

**GemControlStateLocal**

This event signals a transition to a control state of local.

**GemControlStateRemote**

This event signals a transition to a control state of remote.

### Control Scenarios

Unless otherwise noted in this section, the Communications State is "Communicating" and the Control state is either "On-Line/Local" or "On-Line/Remote".

Host Sends On-Line Command

Assumption: Control State is "Host Off-Line". Variable *GemControlState* = 3.

|  |  |  |
| --- | --- | --- |
| ***#*** | ***SECS Message*** | ***Description*** |
| 1. | H -> E S1F17 W | Host instructs the Equipment to go "On-Line". |
| 2. | H <- E S1F18 | Equipment responds to successful On-Line transition with ONLACK=0. Control state transits to either Local or Remote as guided by EC *GemOnLineSubstate*. |
| 3. | H <- E S6F11 W | The Equipment signals CEID *GemControlStateLocal* or *GemControlStateRemote*. |
| 4. | H -> E S6F12 | The Host acknowledges the event. |

* + - 1. **Host Sends Off-Line Command**

Assumption: Control State is "On-Line".

|  |  |  |
| --- | --- | --- |
| ***#*** | ***SECS Message*** | ***Description*** |
| 1. | H -> E S1F15 W | Host instructs the Equipment to go "Off-Line". |
| 2. | H <- E S1F16 | Equipment Control State transitions to "Host Off-Line" and responds to primary. OFLACK= 0. |

* + - 1. **Host Sends Remote Command**

Assumption: Control State is On-Line and Remote.

|  |  |  |
| --- | --- | --- |
| ***#*** | ***SECS Message*** | ***Description*** |
| 1. | H -> E S2F41 [W] | The Host sends the command. The W-bit in this message must be set to 1. |
| 2. | H <- E S2F42 | The Equipment acknowledges the command. If the Equipment cannot perform the command, the acknowledge code in this message is non-zero. If the command can be completed "immediately", the command is performed and the acknowledge code in this message is 0. Otherwise, if the command takes a significant amount of time to complete, the acknowledge code is 4. Successful completion of a command may trigger one or more events. |

* + - 1. **Equipment Rejects Host Command**

Assumption: Control State is Local and On-Line

|  |  |  |
| --- | --- | --- |
| ***#*** | ***SECS Message*** | ***Description*** |
| 1. | H -> E S2F41 [W] | The Host sends the command. The W-bit in this message must be set to 1. |
| 2. | H <- E S2F42 | The Equipment acknowledges the command. The acknowledge code in this message is 0x40 (64 - Control State is incorrect). The Equipment does not perform the command. |

* + - 1. **Remote, Operator-Initiated**

|  |  |  |
| --- | --- | --- |
| ***#*** | ***SECS Message*** | ***Description*** |
| 1. |  | ControlState is Local. The Equipment Operator switches the Equipment to Remote Control. |
| 2. | H ← E S6F11 W | The Equipment signals CEIDGemControlState REMOTE. Event Reports as appropriate. |
| 3. | H → E S6F12 | The Host acknowledges the report. |

* + - 1. **Local, Operator-Initiated**

|  |  |  |
| --- | --- | --- |
| ***#*** | ***SECS Message*** | ***Description*** |
| 1. |  | ControlState is Remote. The Equipment Operator switches the Equipment to Local Control. |
| 2. | H ← E S6F11W | The Equipment signals CEID GemControlState LOCAL. Event Reports as appropriate. |
| 3. | H → E S6F12 | The Host acknowledges the report. |

### Control State Integration

The GP Automation has the concept of Offline, Online-Local, and Online-Remote. The Operator can change the control state from the Tool UI. The host can initiate Local, Remote, Online and Offline Transitions.

## Data Collection

### Variables

The Equipment has a fixed set of Variables which can be read by the Host. Each Variable is identified by a unique Variable ID (VID). The Variables which are supported by the tool are described in chapter 5, Variable Item Dictionary.

There are three types of variables: Status Variables, Data Variables, and Equipment Constants. The Host can read variables of any type, but can set values only for Equipment Constants. The Host can read values for Status Variables and Equipment Constants whenever the Equipment is On-Line, but values for Data Variables are typically meaningful only immediately after certain Collection Events (CEIDs), and so are typically reported only in Event Reports (S6F11).

### Are You There

The Host can send S1F1 at any time to determine if the SECS link is operational. The Equipment responds with S1F2, if the Equipment is in the ONLINE & COMMUNICATING states. This indicates Model Number (MDLN) and Software Revision Number (SOFTREV).

### Host Requests Status

The Host can send S1F3 when the Equipment is On-Line to read Status Variables from the Equipment.

The Host can send S2F13 when the Equipment is On-Line to read Equipment Constants from the Equipment.

For this Equipment, S1F3 and S2F13 with a list of VIDs are essentially the same. That is, either message can return Variables of any type. However, S1F3 with a zero-length list will return only VIDs of type SV, and S2F13 with a zero-length list will return only VIDs of type EC.

### Setting Equipment Constants

The Equipment Operator can change the value for Equipment Constants. Once the Operator has changed an EC value, the Equipment will note the *GemEqpConstChanged* Event. The VID for the changed EC will be reported to the Host in the variable *GemECIDChanged*.

### Reports

The Equipment has a fixed set of Events which can occur. Each Event is identified by a unique Collection Event ID (CEID). The CEIDs which are supported by the tool are listed in section [4.5](#_bookmark78), [Collection Events](#_bookmark78).

When an Event occurs, the Equipment sends the appropriate S6F11 Event Report message to the Host (if that particular event has been enabled). Event Reports are defined by the Host (S2F33) and linked to a specific CEID (S2F35).

The Equipment allows the Host to enable and disable Event Reporting using S2F37. If the Host enables a CEID, for which no Event Report is defined, the Equipment will send a "null" (no data) report when the event occurs.

The Host can "force" Event Reports on the Equipment using the following Event Report Request messages:

* **S6F15** Host Requests an Event Report associated with a CEID.
* **S6F19** Host requests an Event Report associated with a Report ID.

The host can define traces so that the equipment periodically transmits the specified status variable values at a set interval. This feature enables the host to poll the equipment status without having to ask the data at each interval.

### Related Variables

The following variables (SV's, EC's, or DVVALS) are relevant to Data Collection. For the Equipment- specific VIDS for these variables, see the Variable Item Dictionary section of this document.

### Data Collection Scenarios

Unless otherwise noted in this section, the Communications State is "Communicating" and the Control state is either "On-Line/Local" or "On-Line/Remote".

* + - 1. **Host Initializes Event Reporting**

|  |  |  |
| --- | --- | --- |
| ***#*** | ***SECS Message*** | ***Description*** |
| 1. | H -> E S2F37 W | Disable Event Reports. The Host disables reporting for all Collection Events.  S2F37 W  <L [2]  <BOOLEAN F>  <L>  > . |
| 2. | H <- E S2F38 | The Equipment acknowledges. Temporarily, the Equipment will make no event reports. |
| 3. | H ->E S2F33 W | Define Report. The Host erases all previous Report definitions and Links: S2F33 W  <L [2]  <U4 DATAID>  <L>  > . |
| 4. | H <- E S2F34 | The Equipment acknowledges. |
| 5. | H -> E S2F33 W | Define Report. The Host sends Report Definitions. |
| 6. | H <-E S2F34 | The Equipment Acknowledges. |
| 7. | H -> E S2F35 W | Link Events/Reports. The Host links reports to the desired Collection Events. Linked Reports are initially "disabled". |
| 8. | H <- E S2F36 | The Equipment acknowledges |
| 9. | H -> E S2F37 W | Enable Event Reports. The Host enables reporting for desired Collection Events. |
| 10. | H <- E S2F38 | The Equipment acknowledges. From this point on, the Equipment will report events as they occur. |

* + - 1. **Equipment Reports Event**

|  |  |  |
| --- | --- | --- |
| ***#*** | ***SECS Message*** | ***Description*** |
| 1 |  | The Equipment recognizes that an event has occurred. The Host has enabled reporting for the CEID, and possibly has defined one or more Reports and linked them to the CEID. |
| 2. | H <- E S6F11 W | The Equipment sends Event reports for the CEID that occurred |
| 3. | H -> E S6F12 | The Host acknowledges the report. |

* + - 1. **Host Requests Report by CEID**

|  |  |  |
| --- | --- | --- |
| ***#*** | ***SECS Message*** | ***Description*** |
| 1. | H -> E S6F15 W | Request Event Report. The Host requests a report for the specified CEID. In this way, the Host requests the Equipment to "pretend that the specified CEID has occurred. |
| 2. | H <- E S6F16 | The Equipment sends reports linked to that CEID. |

* + - 1. **Host Requests Report by RPTID**

|  |  |  |
| --- | --- | --- |
| ***#*** | ***SECS Message*** | ***Description*** |
| 1. | H -> E S6F19 W | Request Report. The Host requests a report for the specified RPTID. |
| 2. | H <- E S6F20 | The Equipment sends the report. |

* + - 1. **Host Requests Status**

|  |  |  |
| --- | --- | --- |
| ***#*** | ***SECS Message*** | ***Description*** |
| 1. | H -> E S1F3 W | Discrete Variable Request. The Host requests the VIDs of interest. |
| 2. | H <- E S1F4 | The Equipment sends the Variable values. |

* + - 1. **Host Requests Status Variable Namelist**

|  |  |  |
| --- | --- | --- |
| ***#*** | ***SECS Message*** | ***Description*** |
| 1. | H -> E S1F11 W | Host requests the Equipment to identify selected Status Variables. |
| 2. | H <- E S1F12 | The Equipment responds with the descriptions of the requested Status Variables. |

* + - 1. **Host Reads Equipment Constants**

|  |  |  |
| --- | --- | --- |
| ***#*** | ***SECS Message*** | ***Description*** |
| 1. | H -> E S2F13 W | Host requests the values of one or more Equipment Constants. |
| 2. | H <- E S2F14 | The Equipment responds with the values of the requested Equipment Constants. |

* + - 1. **Host Sets Equipment Constants**

|  |  |  |
| --- | --- | --- |
| ***#*** | ***SECS Message*** | ***Description*** |
| 1. | H -> E S2F15W | Host sends new values for one or more Equipment Constants. |
| 2. | H <- E S2F16 | If all new values are valid, the Equipment saves the new values and sends this message with an  acknowledge code of "0". If one or more new values are not valid, no Equipment Constants are changed and the acknowledge code in this message is non-zero. |

|  |  |  |
| --- | --- | --- |
| ***#*** | ***SECS Message*** | ***Description*** |
| 1. | H -> E S2F29 W | Host requests the Equipment to identify selected Equipment Constants. |
| 2. | H <- E S2F30 | The Equipment responds with the descriptions of the requested constants. |

* + - 1. **Host Requests Equipment Constant Namelist**
      2. **Host Initiates Trace Report**

|  |  |  |
| --- | --- | --- |
| ***#*** | ***SECS Message*** | ***Description*** |
| 1. | H -> E S2F23 W | Host initiates a trace. |
| 2. | H <- E S2F24 | The Equipment acknowledges the trace request. If the data inS2F23 is not valid, the acknowledge code in this message is nonzeroand the scenario ends.  Otherwise, the following steps aredone "TOTSMP" times, where TOTSMP is the total number ofsamples to be done. |
| 3. |  | The Equipment waits "DSPER" (data sample period). Whilewaiting, the Equipmentcontinues to  operate normally, respondingto any SECS messages that may be received, etc. |
| 4. | H <- E S6F1 W | The Equipment sends trace data. |
| 5. | H -> E S6F2 | If the S6F1 has its W-bit set to 1, the Host acknowledges the tracedata. |
| 6. |  | If this is the last sample, the Equipment terminates this trace andthe scenario ends. Otherwise, go  back to the beginning of step 3. |

* + - 1. **Host Terminates Trace**

|  |  |  |
| --- | --- | --- |
| ***#*** | ***SECS Message*** | ***Description*** |
| 1. | H -> E S2F23 W | The Host initiates a trace, with the same trace ID as the currentlyrunning trace, and with TOTSMP (number of samples) set to "0". |
| 2. | H <- E S2F24 | The Equipment acknowledges the trace request. If the data inS2F23 is valid, theEquipment terminates the trace. |
| 3. |  | If the Equipment has saved trace data that has not yet been sentto the Host, it discards the saved  data. |

## Alarm Management

The Equipment has a fixed set of alarm conditions which can occur. Each alarm is identified by a unique Alarm ID (ALID), and has an associated severity code (ALCD) and alarm text (ALTX). The alarms supported by this Equipment are listed in section [4.6](#_bookmark79), [Alarms](#_bookmark79).

### Alarm States

Each alarm (ALID) can be in either of two states: CLEAR (off) or SET (on). Several alarms can be SET simultaneously. At power up, all Alarms are cleared.

### Enable/Disable

The Host can use S5F3 (Enable/Disable Alarms) to control which alarms the Equipment should report. Using S5F3, the Host can specify for each ALID whether the Equipment should report that alarm when it occurs. When an alarm transition occurs, if that ALID is enabled the Equipment will send an alarm report message to the Host. If the ALID is disabled, the Equipment will not send the alarm message. The Host can use S2F37 to enable or disable the CEIDs associated with these alarm transitions.

The Equipment saves Alarm Enable/Disable settings on a disk file. When the Equipment powers up, it will restore Alarm Enable/Disable settings to the same condition they had at power off.

### Host Requests Alarm Status

The Host can use S5F5 to request the Equipment to report all alarms that exist and the ON/OFF state for each.

### Related Variables

The following variables (SV's, EC's, or DVVALS) are relevant to alarm management. For the Equipment-specific VIDS for these variables, see chapter 6, Variable Item Dictionary.

**GemAlarmID DV U4**

Indicates the AlarmID when an alarm be set or cleared.

**AlarmsEnabled SV List of U4**

A list of all Alarms which are currently enabled. Format as follows:

**<L**

**<U4 ALID>**

**...**

**>**

**AlarmSet SV List of U4**

A list of all Alarms which are currently in the SET (on) state. Format as follows:

**<L**

**<U4 ALID>**

**...**

**>**

### Related Events

The following collection events (CEIDs) are relevant to Alarm management.

**AlarmSet**

This event indicates a alarm occurred.

**AlarmClear**

This event indicates a alarm cleared.

### Alarm Scenarios

Unless otherwise noted in this section, the Communications State is "Communicating" and the Control state is either "On-Line/Local" or "On-Line/Remote".

* + - 1. **Equipment Reports Alarm**

|  |  |  |
| --- | --- | --- |
| ***#*** | ***SECS Message*** | ***Description*** |
| 1. | H <- E S5F1 [W] | If reporting for this alarm ID is disabled, skip this and the following step. Otherwise send the alarm. |
| 2. | H -> E S5F2 | The Host acknowledges the alarm report. |

|  |  |  |
| --- | --- | --- |
| ***#*** | ***SECS Message*** | ***Description*** |
| 1. | H -> E S5F3 [W] | The Host specifies ALIDs to be enabled or disabled. |
| 2. | H <- E S5F4 | The Equipment acknowledges. |

* + - 1. **Host Enables/Disables Alarms**
      2. **Host Requests Alarms**

|  |  |  |
| --- | --- | --- |
| ***#*** | ***SECS Message*** | ***Description*** |
| 1. | H -> E S5F5 W | The Host requests whether specified ALIDs are "on" or "off". |
| 2. | H <- E S5F6 | The Equipment sends Alarm status. |

## Process Program Management

Processing on the Equipment is controlled by Process Programs. The Equipment only supports the unformatted Process Programs .

The two chambers share a recipe library. A download of a recipe through one SECS/GEM interface affects the recipe of the other SECS/GEM interface. A recipe deleted on one HMI or by SECS/GEM affects both chambers.

**Equipment Management of Process Programs**

The Equipment provides a Process Program Library, implemented as a set of files maintained on a hard disk. Each Process Program is identified by a unique Process Program ID (PPID). The host will be notified via the Collection Event if the Operator creates, changes, or deletes a Process Program.

**Host Management of Process Programs**

Process Programs are saved to disk on the Equipment. Process Programs are typically created and updated at the Equipment. However, the Equipment provides complete facilities for the Host to manage the storage and use of Process Programs. This allows the Equipment to operate cooperatively Host-implemented systems. The Host has the following capabilities:

* *upload a Process Program from the Equipment ,*
* *download a Process Program to the Equipment,*
* *send Multi-block Inquire (S7F1) to the Equipment before sending a multi-block Process Program,*
* *delete one or more Process Programs from the Equipment library,*
* *determine which Process Programs are currently stored in the Equipment library.*

**Note: Process Program ID (PPID) only support ASCII text.**

**Recipe Portability**

A recipe is portable if it can be qualified on one tool and used without change on any number of identical tools of the same model and configuration.

### Related Variables

The following variables (SV's, EC's, or DVVALS) are relevant to Process Program management. For the Equipment-specific VIDS for these variables, see chapter 6, Variable Item Dictionary.

**GemPPChangeName DV A[0..80]**

PPID of the Process Program most recently created, changed, or deleted.

**GemPPChangeStatus DV U1**

The action (create, change, delete) taken on a Process Program.

* **1 = Created**
* **2 = Changed**
* **3 = Deleted**

**GemPPExecName SV A[0..80]**

The PPID of the currently selected Process Program.

For this Equipment, this variable is updated when the Operator or Host uploads or downloads a Process Program, or when the Host deletes a Process Program. The variable is also updated if local changes to recipes are performed by Operators.

**GPA\_PP\_OVERWRITEABLE SV B**

Upon S7F3 download, existing process program name to be rejected or overwritten.

### Related Events

The following collection events (CEIDs) are relevant to Process Program management.

**GemProcessProgramChange**

This event indicates a process program has been created changed or deleted.

**GemProcessProgramModified**

This event indicates the process program has been modified.

**ExecutingProcessProgramChanged**

This event indicates the process progeam whitch to be executed has been changed.

### Process Program Body Format (PPBODY)

CCODE: [1], 101, 7 , Comment 1

|  |  |  |
| --- | --- | --- |
| Temperature1, FT\_4, | 30, | 190, |
| Temperature2, FT\_4, | 30, | 190, |
| Temperature3, FT\_4, | 30, | 190, |
| Temperature4, FT\_4, | 30, | 190, |
| Temperature5, FT\_4, | 30, | 190, |
| OvenTime, FT\_4, | 40, | 480, |

Disclaimer: These limits are accurate when this manual was written. The limits are set in the oven control software and could change in the future with an oven software change.

|  |  |  |  |
| --- | --- | --- | --- |
| ***Parameter*** | ***Unit*** | ***Minimum*** | ***Maximum*** |
| TemperatureSetpoint | Degree C | 50 | 250 |
| RampTime | Min | 1 | 120 |
| RampAlarm | Min | RampTime | 150 |
| DwellTime | Min | 1 | 300 |
| DwellAlarm | Min | DwellTime | 350 |
| StepCounts |  | 1 | 6 |
| CoolingTime | Min | 1 | 120 |
| CoolingTemperature | Degree C | 40 | 250 |
| ProgramEndWarningTime | Min | 0 | 100 |

|  |  |
| --- | --- |
| ***Parameter*** | ***Description*** |
| TemperatureSetpoint | This is a target temperature of the step. |
| RampTime | The amount of time to change the temperature from the current temperature to the target temperature of the step. This is “RAMPTIME”  on HMI. |
| RampAlarm | The amount of time to wait after the ramp time to sound the alarm if the  target temperature is not met. On HMI, the “RAMPALARM” is the RampTimeSV plus this RampTimeoutSV. |
| DwellTime | The amount of time to hold the target temperature after the ramp. |
| DwellAlarm | The amount of time to wait after the beginning of step to sound the  alarm if the target temperature is not met. On HMI, the “DWELLALARM” is the DwellTimeSV plus this DwellTimeoutSV. |
| StepCounts | This is number of steps in the recipe to execute. The parameters  in unused steps are ignored. Steps always execute in order starting at step 1. This is “STEP” on HMI. |
| CoolingTime | The amount of time to run the cooling cycle.If at the end of the cooling cycle, the oven is still too hot, the cooling cycle will end  but the door will stay locked. This is “COOL TIME” on HMI. |
| CoolingTemperature | If after the cooling cycle ends, the temperature is above this  value, the door will stay locked. This is “COOL TEMP” on HMI. |
| ProgramEndWarningTime | The amount of time that the audible alarm will sound when the process is finished. The alarm will stop when the door is opened. If the alarm is stop by pressing “RESET” on the tool but the door is not opened, the alarm will sound again after  ReAlarmInterval(ECID:2000) seconds. This is “PROGRAM END WARNING TIME” on HMI. |

### Process Program Management Scenarios

Unless otherwise noted in this section, the Communications State is "Communicating" and the Control state is either "On-Line/Local" or "On-Line/Remote".

* + - 1. **Unformatted, Equipment-Initiated Upload**

|  |  |  |
| --- | --- | --- |
| ***#*** | ***SECS Message*** | ***Description*** |
| 1. | H -> E S7F17 W | Host sends a request to delete one or more Process Programs from the Equipment's library of Process Programs. |
| 2. | H <- E S7F18 | The Equipment replies with an acknowledge code. If all specified Process Program(s) were deleted successfully, the acknowledge code is 0. If one or more of the specified Process Programs could not  be deleted, the acknowledge code is non-zero. |

* + - 1. **Host Deletes Process Program**
      2. **Host Requests Directory**

|  |  |  |
| --- | --- | --- |
| ***#*** | ***SECS Message*** | ***Description*** |
| 1. | H -> E S7F19 W | Host requests the names (PPIDs) of all Process Programs that are stored in the Equipment's Process Program library. |
| 2. | H <- E S7F20 | The Equipment replies with the list of PPIDs. |

* + - 1. **Operator Changes Process Program Library**

|  |  |  |
| --- | --- | --- |
| ***#*** | ***SECS Message*** | ***Description*** |
| 1. |  | The Equipment Operator creates, changes, or deletes a Process Program in the Library. |
| 2. | H <- E S6F11 W | The Equipment sets *GemPPChangeStatus* to "Create", "Change", or "Delete", as appropriate, sets  *GemPPChangeName*, and signals CEID *GemProcessProgramChange* Event. Event Reports as appropriate. |
| 3. | H -> E S6F12 | The Host acknowledges the report. |

* + - 1. **Host Deletes Process Program**

|  |  |  |
| --- | --- | --- |
| ***#*** | ***SECS Message*** | ***Description*** |
| 1. | H → E S7F17 W | Host sends a request to delete one or more Process Programs from the Equipment’s  library of Process Programs. |
| 2. | H ← E S7F18 | The Equipment replies with an acknowledge code. If all specified Process Program(s) were deleted successfully, the acknowledge code is 0. If one or more of the specified Process  Programs could not be deleted, the acknowledge code is non-zero. |

* + - 1. **Host Requests Directory**

|  |  |  |
| --- | --- | --- |
| ***#*** | ***SECS Message*** | ***Description*** |
| 1. | H→ E S7F19 W | Host requests the names (PPIDs) of all Process Programs that are stored in the  Equipment’s Process Program library. |
| 2. | H ← E S7F20 | The Equipment replies with the list of PPIDs. |

* + - 1. **Operator Changes Process Program Library**

|  |  |  |
| --- | --- | --- |
| ***#*** | ***SECS Message*** | ***Description*** |
| 1. |  | The Equipment Operator creates, changes, or deletes a Process Program in the Library. |
| 2. | H ← E S6F11 W | The Equipment sets GEM\_PP\_CHANGE\_STATUS to “Create”, “Change”, or “Delete”, as  appropriate, sets GEM\_PP\_CHANG\_ENAME, and signals CEID GEM\_PP\_CHANGED Event. Event Reports as appropriate. |
| 3. | H → E S6F12 | The Host acknowledges the report. |

## Remote Commands

Setup and processing at the Equipment can be guided by either a local Operator or by a Host computer. This section describes the remote commands available to the Host.

Once in the Remote state, the Host has the authority to issue any of these remote commands and they will not be rejected because of an invalid control state. Commands may be rejected for other reasons.

Operator still has the ability to issue commands and change the control state. When the Operator "grabs" control away from the Host by changing the Control State away from Remote, the Equipment will send either the GemControlStateLOCAL or GemEqpOffLine event to the Host.

### S2F41 Command Format

The general format for remote commands using the S2F41 message is:

**S2F41 [W]** *\* H→E*

**<L [2]**

**<A RCMD>** *\* Remote command string*

**<L**

**<L [2]**

**>**

**...**

**>**

**> .**

**<A CPNAME>** *\* Command Parameter Name*

**<CPVAL>** *\* Command Parameter Value*

### Supported Remote Commands

The following remote commands are supported by GP Automation software.

* + - 1. **PP\_SELECT**

PP\_SELECT is used to specify the recipe for processing substrates. The command instructs the Equipment to make the requested Job in the execution area.

The Job name are specified via the command parameters.

* + - * + When the tool receives the *PP\_SELECT*, the information is cached.
        + If an invalid process progam name is specified, the command fails and returns an *HCACK3*

(Invalid Parameter).

**PP\_SELECT Command Parameters**

|  |  |  |
| --- | --- | --- |
| ***Attribute*** | ***Type/Format*** | ***Notes*** |
| PPID | string  <A “PP1”> | The name of the processprogram. |
| **LOTID** | string  <A “**AB1CDE2FG**”> | Specified lot id. |
| **LOTQTY** | string  <A “**48**”> | Quantity of current specified lot. |

Example:

**S2F41 [w]**

**<L [2]**

**<A ‚PP\_SELECT‛>**

**<L**

**<L [2]**

**<A ‚PPID‛>**

**<A ‚PP1‛>**

**>**

**<L [2]**

**<A ‚LOTID‛>**

**<A ‚AB1CDE2FG‛>**

**>**

**<L [2]**

**<A ‚LOTQTY‛>**

**<A ‚48‛>**

**>**

**>**

**>**

* + - 1. **REMOTE**

This command

* + - * + The command is valid when Control State in LOCAL state; in any other scenario, the command fails and returns an HCACK 2 (Cannot perform now).

**Parameters: None**

* + - 1. **LOCAL**
         * The command is valid when Control State in REMOTE state; in any other scenario, the command fails and returns an HCACK 2 (Cannot perform now).

**Parameters: None**

### Remote Command Scenarios

Unless otherwise noted in this section, the Communications State is “Communi-cating” and the Control state is either “Online-Local” or “Online-Remote”.

* + - 1. **Host Sends Remote Command**

Assumption: Control State is On-Line and Remote.

|  |  |  |
| --- | --- | --- |
| ***#*** | ***SECS Message*** | ***Description*** |
| 1. | H -> E S2F41 [W] | The Host sends the command. The W-bit in this message must be 1. |
| 2. | H <- E S2F42 | The Equipment acknowledges the command. If the Equipment cannot perform the command,  the acknowledge code in this message is non-zero. If the command can be completed “immediately”, the command is performed and the acknowledge code in this message is 0. |

* + - 1. **Scenario Example of Process**

|  |  |  |
| --- | --- | --- |
| ***#*** | ***SECS Message*** | ***Description*** |
| 1. |  | Operator check Online Remote. |
| 2. | H -> E S1F3(15) | Check processing state. |
| 3. | E -> H S1F4 | Host verify the processing state is IDLE. |
| 4. |  |  |
| 5. |  |  |
| 6. | H -> E S2F41 [W] | Host send PP\_SELECT command. |
| 7. | E -> H S2F42 | Equipment load recipe and return an HCACK 0x00. |
| 8. |  | Check PPID(RecipeName). |
| 9. |  | Host verify PPID(RecipeName) matches that in PP\_SELECT. |
| 10. |  | Check LotIDs. |
| 11. |  | Host verify the LotIDs. |
| 12. |  | EFEM starts to transfer panels of the lot. |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

Error Messages

The Equipment provides standard Stream 9 messages to report SECS-I errors. See section [0](#_bookmark70),

[S7,F23 Formatted Process Program Send S,H↔E](#_bookmark70)

[**<L [4]**](#_bookmark70)

[**<A PPID>**](#_bookmark70)

[**<A MDLN>** *\* MDLN Model Number*](#_bookmark70)

[**<A SOFTREV>** *\* SOFTREV Software Revision*](#_bookmark70)

[**<L [m]**](#_bookmark70)

[**<L [2]**](#_bookmark70)

[**<A CCODE> *\**** *Process Operation Command Code*](#_bookmark70)

[**<L [n]**](#_bookmark70)

[**<A PPARM> *\**** *Process Parameter*](#_bookmark70)

[**…**](#_bookmark70)

[**>**](#_bookmark70)

[**>**](#_bookmark70)

[**…**](#_bookmark70)

[**>**](#_bookmark70)

[**>.**](#_bookmark70)

[**S7,F24 Formatted Process Program Acknowledge S,H↔E**](#_bookmark70)

[**<B[1] ACKC10>**](#_bookmark70)

[**S7,F25 Formatted Process Program Request S,H↔E**](#_bookmark70)

[**<A PPID>**](#_bookmark70)

[**S7,F26 Formatted Process Program Data S,H↔E**](#_bookmark70)

[**<L [4]**](#_bookmark70)

[**<A PPID>**](#_bookmark70)

[**<A MDLN>** *\* MDLN Model Number*](#_bookmark70)

[**<A SOFTREV>** *\* SOFTREV Software Revision*](#_bookmark70)

[**<L [m]**](#_bookmark70)

[**<L [2]**](#_bookmark70)

[**<A CCODE> *\**** *Process Operation Command Code*](#_bookmark70)

[**<L [n]**](#_bookmark70)

[**<A PPARM> *\**** *Process Parameter*](#_bookmark70)

[**…**](#_bookmark70)

[**>**](#_bookmark70)

[**>**](#_bookmark70)

[**…**](#_bookmark70)

[**>**](#_bookmark70)

[**>**](#_bookmark70)

[Stream 9: System Errors](#_bookmark70) for a more detailed description of these messages:

* + - * + **S9F1** Unrecognized Device ID
        + **S9F3** Unrecognized Stream
        + **S9F5** Unrecognized Function
        + **S9F7** Invalid Data
        + **S9F9** Transaction Timeout
        + **S9F11** Data Too Long
        + **S9F13** Conversation Timeout

### Error Message Scenarios

* + - 1. **Unrecognized Device ID**

|  |  |  |
| --- | --- | --- |
| ***#*** | ***SECS Message*** | ***Description*** |
| 1. | H -> E SnFn [W] | Host sends a message with a bad Device ID in the header. The W-bit can be either 0 or 1. |
| 2. | H <- E S9F1 | Equipment replies with “Unrecognized Device ID”. |

* + - 1. **Unrecognized Stream**

|  |  |  |
| --- | --- | --- |
| ***#*** | ***SECS Message*** | ***Description*** |
| 1. | H -> E SnFn [W] | Host sends a primary message with a stream number that the Equipment does not support.  The W-bit can be either 0 or 1. |
| 2. | H <- E S9F3 | Equipment replies with “Unrecognized Stream”. |

* + - 1. **Unrecognized Function**

|  |  |  |
| --- | --- | --- |
| ***#*** | ***SECS Message*** | ***Description*** |
| 1. | H -> E SnFn [W] | Host sends a primary message with a stream number for which the Equipment recognizes some messages, but with a function number that the Equipment does not support for that stream.  The W-bit can be either 0 or 1. |
| 2. | H <- E S9F5 | Equipment replies with “Unrecognized Function”. |

* + - 1. **Illegal Data Format**

|  |  |  |
| --- | --- | --- |
| ***#*** | ***SECS Message*** | ***Description*** |
| 1. | H -> E SnFn [W] | Host sends a message with a stream and function that the Equipment recognizes, but with a  data format that is incorrect. The W-bit can be either 0 or 1. |
| 2. | H <- E S9F7 |  |

* + - 1. **Data Too Long**

|  |  |  |
| --- | --- | --- |
| ***#*** | ***SECS Message*** | ***Description*** |
| 1. | H -> E SnFn [W] | Host sends a message with a stream and function that the Equipment recognizes, but contains  more data than expected. The W-bit can be either 0 or 1. |
| 2. | H <- E S9F11 | Equipment replies with “Data Too Long”. If the erroneous message is a primary with the W- bit set to 1, then in some cases the Equipment will reply with the usual secondary response with an appropriate error code, instead of S9F11. If the erroneous message is a secondary,  the Equipment makes no reply at all. |

## Equipment Terminal Services

### Purpose

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

### Detailed Description

The equipment is capable of displaying information passed to it by the host for the operator's attention. The information, or an indication of a message, remains on the equipment's display until the operator indicates message recognition. Message recognition results in a collection event that informs the host that the operator has actually viewed the information.

The equipment is capable of passing information to the host that has been entered from the operator's equipment console. This information is intended for host applications and is not processed by the equipment.

The equipment has no responsibility for interpreting any of the data passed to or from the host using this method.

### Scenarios

* + - 1. **Host sends information to an equipment’s display device**

|  |  |  |
| --- | --- | --- |
| ***#*** | ***SECS Message*** | ***Description*** |
| 1. | H → E S10F3 | Host sends textual information to equipment for display to the operator on terminal x. |
| 2. | H ← E S10F4 | Equipment acknowledges request to display text (equipment sets unrecognized  message indicator). |
|  |  | Operator indicates message recognition (equipment clears unrecognized message indicator). |
| 3. | H ← E S6F11 | Message recognition event. |
| 4. | H → E S6F12 | Host acknowledges. |
| 5. | H ← E S10F1 | Operator responds with text via terminal x. |
| 6. | H → E S10F2 | Host acknowledges receipt of operator text. |
|  |  |  |

* + - 1. **Host sends information to an equipment’s display device and then overwrites the**

**information before operator recognizes message**

|  |  |  |
| --- | --- | --- |
| ***#*** | ***SECS Message*** | ***Description*** |
| 1. | H → E S10F3 | Host sends textual information to equipment for display to the operator on terminal x. |
| 2. | H ← E S10F4 | Equipment acknowledges request to display text (equipment sets unrecognized  message indicator). |
| 3. | H → E S10F3 | Host sends textual information to equipment for display to the operator on terminal x.  This message overwrites the first one sent by the host since it is still unrecognized. |
| 4. | H ← E S10F4 | Equipment acknowledges request to display text (equipment sets unrecognized message indicator). |
|  |  | Operator indicates message recognition. (equipment clears unrecognized message  indicator). |
| 5. | H ← E S6F11 | Message recognition event. |
| 6. | H → E S6F12 | Host acknowledges. |

* + - 1. **Operator sends information to the host**

|  |  |  |
| --- | --- | --- |
| ***#*** | ***SECS Message*** | ***Description*** |
| 1. | H ← E S10F1 | Operator sends textual information via equipment terminal x. |
| 2. | H → E S10F2 | Host acknowledges receipt of operator initiated message. |
| 3. | H → E S10F3 | (Optional )  Host responds with information for display to the operator on terminal x. |
| 4. | H ← E S10F4 | Equipment acknowledges receipt of request to display text. Equipment sets  unrecognized message indicator. |
| 5. | H ← E S6F11 | Operator indicates message recognition;  Message recognition event. |
| 6. | H → E S6F12 | Host acknowledges. |

## Clock

The Equipment contains Clock/Calendar hardware, by which it knows the current date and time.

* The Host can send S2F31 to set the Equipment‟s Clock/Calendar hardware.
* The Host can send S2F17 to read the Equipment‟s Clock/Calendar hardware.

### Related Variables

The following variables (SV‟s, EC‟s, or DVVALS) are relevant to the clock. For the Equipment- specific VIDS for these variables, see chapter 6, Variable Item Dictionary.

**GemClock SV A[16]**

The Equipment‟s current Date and Time in the following format: YYYYMMDDhhmmsscc.

* **YYYY = year**
* **MM = month**
* **DD = day**
* **hh = hours**
* **mm = minutes**
* **ss = seconds**
* **cc = centiseconds**

### Clock Scenarios

* + - 1. **Host Sets Date and Time**

|  |  |  |
| --- | --- | --- |
| ***#*** | ***SECS Message*** | ***Description*** |
| 1. | H -> E S2F31 W | Date and Time Send. The Host sends a new Date and Time to the Equipment. |
| 2. | H <- E S2F32 | The Equipment sets its Clock/Calendar hardware and acknowledges the command. |

* + - 1. **Host Requests Date and Time**

|  |  |  |
| --- | --- | --- |
| ***#*** | ***SECS Message*** | ***Description*** |
| 1. | H -> E S2F17 W | Date and Time Request. The Host requests Date and Time from the Equipment. |
| 2. | H <- E S2F18 | The Equipment sends its Date and Time. |

## Equipment Processing States

The following processing state model is applicable only when the tool is running in operational mode (e.g., not engineering) with a factory Host using a standard GEM interface to issue remote commands to the tool, or an Operator available to issue commands locally via the tool‟s HMI.



INIT

1



MAINTENANCE

7

8

IDLE

6

2

READY

5

3

EXECUTING

PROCESS

4

FINISHED

PROCESSING ACTIVE

|  |  |  |  |
| --- | --- | --- | --- |
| ***#*** | ***Current State*** | ***Trigger*** | ***New State*** |
| 1 | INIT | System initialization completes successfully. | IDLE |
| 2 | IDLE | A recipe had selected, lot management has configured properly and  door closed and armed. | READY |
| 3 | READY | Equipment has received a START command from the host. | EXECUTING |
| 4 | EXECUTING | Equipment finishes baking. | STOP |
| 5 | STOP | Operator press the stop button on the HMI at tool and open the  door. | IDLE |
| 6 | MAINTENANCE | The operator left manual mode. | IDLE |

### Related Variables

**EquipmentState SV U1**

The current processing state of the Equipment.

* **0 = Unknown**
* **1 = INIT**
* **2 = IDLE**
* **3 = READY**
* **4 = EXECUTING**
* **5 = STOP**
* **6 = MAINTENANCE**

### Related Events

**Equipment Status Change**

A Processing State model transition has occurred.

## Supported Host to Equipment Messages

The following messages are initiated by the Host and expect replies from the Equipment.

**Equipment Status**

|  |  |  |
| --- | --- | --- |
| ***Primary*** | ***Reply*** | ***Description*** |
| S1F1 | S1F2 | Are You There Request |
| S1F3 | S1F4 | Selected Equipment Status Report |
| S1F11 | S1F12 | Status Variable Namelist Request |
| S1F13 | S1F14 | Establish Communications Request |
| S1F15 | S1F16 | OFF-LINE Request |
| S1F17 | S1F18 | ON-LINE Request |

**Equipment Control and Diagnostics**

|  |  |  |
| --- | --- | --- |
| ***Primary*** | ***Reply*** | ***Description*** |
| S2F13 | S2F14 | Equipment Constant Request |
| S2F15 | S2F16 | New Equipment Constant Send |
| S2F17 | S2F18 | Date & Time Request |
| S2F23 | S2F24 | Trace Initialize Send |
| S2F29 | S2F30 | Equipment Constant Namelist Request |
| S2F31 | S2F32 | Date and Time Set |
| S2F33 | S2F34 | Define Report |
| S2F35 | S2F36 | Link Event Report |
| S2F37 | S2F38 | Enable/Disable Event Report |
| S2F39 | S2F40 | Multi-block Inquire |
| S2F41 | S2F42 | Remote Command with Parameters |
| S2F43 | S2F44 | Reset Spooling Streams and Functions |

**Alarm Reporting**

|  |  |  |
| --- | --- | --- |
| ***Primary*** | ***Reply*** | ***Description*** |
| S5F3 | S5F4 | Enable/Disable Alarm Send |
| S5F5 | S5F6 | List Alarms Request |

**Data Collection**

|  |  |  |
| --- | --- | --- |
| ***Primary*** | ***Reply*** | ***Description*** |
| S6F15 | S6F16 | Event Report Request |
| S6F19 | S6F20 | Individual Report Request |

**Process Program Management**

|  |  |  |
| --- | --- | --- |
| ***Primary*** | ***Reply*** | ***Description*** |
| S7F1 | S7F2 | Process Program Load Inquire |
| S7F17 | S7F18 | Process Program Delete |
| S7F19 | S7F20 | Process Program Directory |
| S7F23 | S7F24 | Formatted Process Program Send |
| S7F25 | S7F26 | Formatted Process Program Request |

**Terminal Services**

|  |  |  |
| --- | --- | --- |
| ***Primary*** | ***Reply*** | ***Description*** |
| S10F3 | S10F4 | Terminal Display, Single |

## Supported Equipment to Host Messages

The following messages are initiated by the Equipment and expect replies from the Host.

**Equipment Status**

|  |  |  |
| --- | --- | --- |
| ***Primary*** | ***Reply*** | ***Description*** |
| S1F1 | S1F2 | Are You There Request |
| S1F13 | S1F14 | Establish Communications Request |

**Alarm Reporting**

|  |  |  |
| --- | --- | --- |
| ***Primary*** | ***Reply*** | ***Description*** |
| S5F1 | S5F2 | Alarm Report Send |

**Data Collection**

|  |  |  |
| --- | --- | --- |
| ***Primary*** | ***Reply*** | ***Description*** |
| S6F1 | S6F2 | Trace Data Send |
| S6F11 | S6F12 | Event Report Send |

**Process Program Management**

|  |  |  |
| --- | --- | --- |
| ***Primary*** | ***Reply*** | ***Description*** |
| S7F1 | S7F2 | Process Program Load Inquire |
| S7F23 | S7F24 | Formatted Process Program Send |
| S7F25 | S7F26 | Formatted Process Program Request |

**System Errors**

|  |  |  |
| --- | --- | --- |
| ***Primary*** | ***Reply*** | ***Description*** |
| S9F1 | ---- | Unrecognized Device ID |
| S9F3 | ---- | Unrecognized Stream Type |
| S9F5 | ---- | Unrecognized Function Type |
| S9F7 | ---- | Illegal Data |
| S9F9 | ---- | Transaction Timer Time-out |
| S9F11 | ---- | Data Too Long |
| S9F13 |  | Convesation Timeout |

**Terminal Services**

|  |  |  |
| --- | --- | --- |
| ***Primary*** | ***Reply*** | ***Description*** |
| S10F1 | S10F2 | Terminal Request, Single |

## Stream 1: Equipment Status

**S1,F1 Are You There? S, H<->E, reply**

The Host may send this message to the Equipment at any time.

**S1,F2 On Line Data S, H<-E**

The Equipment reports its Model Number and Software Revision.

**<L**

**<A MDLN>** *\* MDLN Model Number*

**<A SOFTREV>** *\* SOFTREV Software Revision*

**> .**

**S1,F3 Selected Status Request S, H->E, reply**

The Host requests status from the Equipment. The Host sends the VIDs of interest. Several VIDs can be specified if desired.

**<L**

**<U4 VID>** *\* Variable ID*

**...**

**> .**

* Normally, only VIDs of class SV (i.e. Status Variables) are used in this message. However, the Equipment allows the Host to use any VID of class DV, EC, or SV.
* If S1F3 contains a zero-length list, then the Equipment will report all variables of class SV, in order by VID.

**S1,F4 Selected Status Data M, H<-E**

The Equipment returns the Variable Values in the order requested by S1F3.

**<L**

**<V>** *\* Status Variable Value*

**...**

**> .**

If any VID specified in S1F3 is invalid, the corresponding V in S1F4 has the following error format:

**<L>** *\* V for Invalid VID*

**S1,F11 Status Variable Namelist Request S, H->E, reply**

The Host format descriptions for the specified Variables. Several VIDs can be specified if desired.

**<L**

**<U4 VID>** *\* Status Variable ID*

**...**

**>.**

* Normally, only VIDs of class SV (i.e. Status Variables) are used in this message.
* However, any VID of class DV, EC, or SV can be used.

If S1F11 contains a zero-length list, then the Equipment will report all variables of class SV, in order by VID.

**S1F11 W** *\* H->E*

**<L> .**

**S1,F12 Status Variable Namelist Reply M, H<-E**

The Equipment returns the Variable descriptions in order requested in S1F11.

**<L**

**<L [3]**

**<U4 VID>** *\* Variable ID*

**<A SVNAME>** *\* Status Variable Name*

**<A UNITS>** *\* Units of Measure*

*>*

**...**

**> .**

If any VID specified in S1F11 is invalid, the corresponding List in S1F12 has the following error format:

**<L>** *\* Instead of L [3]*

**S1,F13 Connect Request S, H<->E, reply**

The Equipment sends this message using the following format.

**<L**

**<A MDLN>**

**<A SOFTREV>**

**> .**

The Host sends this message using the following format.

**S1F13 W** *\* H->E*

**<L> .**

* Either end of the link may send S1F13 as the first message to establish connection of the link.

**S1,F14 Connect Request Acknowledge S, H<->E**

The Equipment sends this message using the following format:

**S1F14** *\* H<-E*

**<L**

**<B [1] 00>** *\* COMMACK*

**<L**

**<A MDLN>**

**<A SOFTREV>**

**>**

**> .**

The Host sends this message using the following format:

**S1F14** *\* H->E*

**<L**

**<B [1] 00>** *\* COMMACK*

**<L>**

**> .**

* The Equipment always sends the value 0x00 for COMMACK.
* In messages received from the Host, COMMACK value 0x00 indicates acceptance of the connect request. Any other value indicates refusal.

**S1,F15 Request Off-Line S, H->E, reply**

Host requests the Equipment to go Off-Line.

**S1,F16 Off-line Acknowledge S, H<-E**

Equipment Control State transits to Host Off-Line and sends this message in response to S1F15 primary. OFLACK is always zero.

**<B [1] 0x00> .** *\* OFLACK*

**S1,F17 On-line Request S, H->E, reply**

Host requests the Equipment to go On-Line.

**S1,F18 Online Acknowledge S, H<-E**

Equipment responds to S1F17 primary in an attempt to go On-Line. Data item ONLACK indicates the success or failure of the attempt.

**<B [1] ONLACK> .**

Values for ONLACK as follows:

* **0x00** OK. Equipment On-Line transition successful. Equipment Control State transits to either Local or Remote while On-Line as guided by the EC “GemOnlineSubstate”.
* **0x01** On-Line not allowed.
* **0x02** Equipment already On-Line.

## Stream 2: Equipment Control and Diagnostics

**S2,F13 Equipment Constant Request S, H->E, reply**

The Host requests the VIDs of interest. Several VIDs can be specified if desired.

**<L**

**<U4 VID>** *\* Equipment Constant ID*

**...**

**> .**

* Normally, only VIDs of class EC (i.e. Equipment Constants) are used in this message. However, any VID of class DV, EC, or SV can be used.
* If S2F13 contains a zero-length list, then the Equipment will report all variables of class EC, in order by VID.

**S2,F14 Equipment Constant Data M, H<-E**

The Equipment returns the Equipment Constants in the order requested in S2F13.

**<L**

**<V>** *\* Equipment Constant Value*

**...**

**> .**

If any VID specified in S2F13 is invalid, the corresponding V in S2F14 has the following error format:

**<L>** *\* V for Invalid VID*

**S2,F15 New Equipment Constant Send S, H->E, reply**

The Host sends new values for desired Equipment Constants. Several Equipment Constants can be specified if desired.

**<L**

**<L [2]**

**<U4 VID>** *\* Equipment Constant ID*

**<V>**

**>**

**...**

**> .**

* Only VIDs of class EC can be used in this message.

**S2,F16 Equipment Constant Send Acknowledge S, H<-E**

Normal completion returns a zero (0) in EAC.

**<B [1] EAC> .** *\* Equipment Acknowledge Code*

If any ECID or ECV in S2F15 is invalid, then EAC contains a non-zero value, and the Equipment rejects the entire S2F15. Possible EAC values are:

* **0x00** Acknowledge
* **0x01** Denied: At least one ECID invalid
* **0x03** Denied: At least one ECV out of range
* **0x04** Denied: At least one ECV‟s type miss match

**S2,F17 Date and Time Request S, H->E, reply**

The Host may send this message at any time to determine the Date and Time base which the Equipment is currently using.

NOTE: The Equipment provides no mechanism to send this message at the request of the Operator.

**S2,F18 Date and Time Data S, H<-E**

This message contains the current Date and Time.

<A „YYYYMMDDhhmmsscc‟> . \* TIME – Date and Time

* YY Year (last two digits), 00 to 99
* MM Month, 01 to 12
* DD Day, 01 to 31
* hh Hours, 00 to 23
* mm Minutes, 00 to 59
* ss Seconds, 00 to 59

When the Equipment receives a good S2F18, it sets its internal clock/calendar.

**S2,F23 Trace Initialize Send S, H->E**

The host requests a time driven trace of specified status variables. If TOTSMP is zero, the machine will cancel an existing trace with the given TRID.

**<L**

**<L [5]**

**<TRID>** *\* Trace request ID*

**<DSPER>** *\* Data sample period, hhmmss is always supported*

**<TOTSMP>** *\* Total samples to be made*

**<REPGSZ>** *\* Reporting group size*

**<L [n]**

**<SVID>** *\* Status variable ID*

**>**

**>**

**...**

**> .**

**S2,F24 Trace Initialize Acknowledge S, H<-E**

**TIAACK:**

**0: Acknowledge 1: Too many SVID**

**2: No more trace allowed 4: Group size too big**

**5: SVID not exis**

**S2,F29 Equipment Constant Namelist Request S, H->E, reply**

The Host requests format descriptions for the specified Equipment Constants. Several VIDs can be specified if desired.

**<L**

**<U4 VID>** *\* Equipment Constant ID*

**...**

**> .**

* Only VIDs of class EC (i.e. Equipment Constants) can be used in this message.
* If S2F29 contains a zero-length list, then the Equipment will report all variables of class EC, in order by VID.

**S2,F30 Equipment Constant Namelist Reply M, H<-E, reply**

The Equipment returns the Equipment Constant descriptions in the order requested in S2F29.

**<L**

**<L [6]**

**<U4 VID>** *\* Equipment Constant ID*

**<A ECNAME>** *\* Equipment Constant Name*

**<ECMIN>** *\* ECV Minimum Value*

**<ECMAX>** *\* ECV Maximum Value*

**<ECDEF>** *\* ECV Default Value*

**<A UNITS>** *\* Units of Measure*

**>**

**...**

**> .**

If any VID specified in S2F29 is invalid, the corresponding List in S2F30 has the following error format:

**<L>** *\* Instead of L [6]*

**S2,F31 Date and Time Send S, H->E, reply**

The Host commands the Equipment to set its Date and Time base to the specified value.

**<A ‘YYYYMMDDhhmmsscc’>** *\* TIME – Date and Time*

* + When the Equipment receives a good S2F31, it sets its internal clock/calendar.

**S2,F32 Date and Time Acknowledge S, H<-E**

The Equipment sets its date and time.

**<B [1] TIACK>** *\* TIACK – Acknowledge Code*

Values for TIACK as follows:

* + **0x00** Normal. Everything correct.
  + **0x01** Invalid Date and/or Time.

**S2,F33 Define Report M, H->E, reply**

The Host specifies one or more Report IDs, and defines which Variables should be included in each report.

**<L [2]**

**<U4 DATAID>** *\* DATAID*

**<L**

**<L [2]**

**<U4 RPTID>** *\* Report ID*

**<L**

**>**

**...**

**>**

**> .**

**<U4 VID>** *\* Variable ID*

**...**

**>**

* + If S2F33 is multi-block, the Host may optionally send the S2F39/S2F40 Inquire/Grant Transaction before sending S2F33, but this Equipment does not require it.
  + The Equipment ignores DATAID.
  + If the Equipment already contains existing Report Definitions, then this mess-age can be used to download additional definitions for RPTIDs not yet defined. The Host cannot download a new Report Definition for a RPTID for which a Re-port Definition already exists in the Equipment. Instead, to change a Report Definition the Host must first delete the old Report Definition and then send a

new Report Definition for that RPTID.

The Host can delete selected report definitions and associated links in the Equipment by using the following specifications in S2F33:

**...**

**<L [2]**

**<U4 RPTID>** *\* Report ID to delete*

**<L>**

**...**

The Host can delete all report definitions and associated links in the Equipment by using the following special format:

**S2F33 W** *\* H->E*

**<L [2]**

**<U4 DATAID>** *\* DATAID*

**<L>**

**> .**

**S2,F34 Define Report Acknowledge S, H<-E**

Normally, DRACK is zero. Any non-zero DRACK indicates the Equipment has rejected the entire S2F33 message.

**<B [1] DRACK> .** *\* DRACK – Acknowledge Code*

Values for DRACK as follows:

* + **0x00** OK
  + **0x01** Denied. Insufficient space.
  + **0x04** Denied. At least one VID does not exist.

**S2,F35 Link Event Report M, H->E, reply**

The Host links Report Ids to selected Collection Event Ids. The Specified CEIDs are initialized to “disabled”. See S2F37 for enabling CEIDs.

**<L [2]**

**<U4 DATAID>** *\* DATAID*

**<L**

**<L [2]**

**<U4 CEID>** *\* Collection Event ID*

**<L**

**>**

**...**

**>**

**> .**

**<U4 RPTID>** *\* Report ID*

**...**

**>**

* + If S2F35 is multi-block, the Host may optionally send the S2F39/S2F40 Inquire/Grant transaction before sending S2F35, but the Equipment does not require it.
  + The Equipment ignores DATAID.

The Host can eliminate all links for a CEID by sending the following format in S2F35 for that CEID:

**...**

**<L [2]**

**<U4 CEID>** *\* Collection Event ID*

**<L>**

**>**

**...**

**S2,F36 Link Event Report Acknowledge S, H<-E**

The Equipment responds.

**<B [1] LRACK> .** \* LRACK – Acknowledge Code

Normally, LRACK is zero. Any non-zero LRACK indicates the Equipment has rejected the entire S2F35 message.

* + **0x00** OK
  + **0x04** Denied. At least one CEID does not exist.
  + **0x05** Denied. At least one RPTID does not exist.

**S2,F37 Enable/Disable Event Report S,H->E, reply**

The Host enables reporting for a list of Collection Event IDs, or disables reporting for the list.

**<L [2]**

**<BOOLEAN CEED>** \* Collection Event Enable

**<L**

**<U4 CEID>** \* Collection Event ID

**...**

**>**

**> .**

* + CEED is “True” to indicate Enabling, or “False” to indicate disabling reporting for the specified CEIDs.

The Host can enable or disable all CEIDs by using the following special format:

S2F37 W \* H->E

<L [2]

<BOOLEAN CEED> \* Coll. Event Enable

<L>

> .

**S2,F38 Enable/Disable Event Report Acknowledge S, H<-E**

The Equipment responds.

**<B [1] ERACK> .** \* ERACK – Acknowledge Code

Normally, ERACK is zero. Any non-zero ERACK indicates the Equipment has rejected the entire S2F37 message.

* + **0x00** OK
  + **0x01** Denied. At least one CEID does not exist.

**S2,F41 Remote Command with Parameters S, H->E**

The Host sends a command with parameters to the Equipment.

**<L [2]**

**<A RCMD>** \* Remote command string

**<L**

**<L [2]**

**<A CPNAME>** \* Command Parameter Name

**<CPVAL>** \* Command Parameter Value

**>**

**...**

**>**

**> .**

If a command has no parameters, S2F41 has the following format:

**S2F41 [W]** \* H->E

**<L [2]**

**<A RCMD>** \* Remote Command String

**<L>**

**> .**

* + The Equipment ignores case when performing validity checks on the RCMD and CPNAME strings. The ASCII strings described below may be sent in any combination of upper and lower case characters.
  + The Host must set the W-Bit to “1” in S2F41; the Equipment replies with S2F42.

**S2,F42 Remote Command Acknowledge S, H<-E**

Normal completion returns a zero (0) in HCACK.

**<L [2]**

**<B [1] HCACK>** \* Host Command Ack. Code

**<L [n]**

**<L [2]**

**<A CPNAME>** \* name of parameter

**<B [1] CPACK>** \* Cmd Param Ack Code

**>**

**...**

**>**

**> .**

## Stream 5: Exception Handling

**S5,F1 Alarm Report S, H<-E, [reply]**

This message is the “normal” message that the Equipment uses to report alarms.

**<L [3]**

**<B [1] ALCD>** \* ALCD – Alarm On/Off

**<U4 ALID>** \* ALID – Alarm ID

**<A [40] ALTX>** \* ALTX – Alarm Text

**> .**

* The Equipment reports that an alarm condition has changed.
* ALID identifies the Alarm.
* The high-order bit of ALCD will be “1” if this alarm is currently On (Unsafe), or “0” if it is currently Off (Safe).
* ALTX contains up to 120 bytes of Alarm Text.

**S5,F2 Alarm Acknowledge S, H->E**

The Host acknowledges the Alarm Report. This Equipment ignores the ACKC5.

**<B [1] 00>.** \* ACK5 – Alarm Acknowledge

**S5,F3 Enable/Disable Alarm Send S, H->E, [reply]**

The Host commands the Equipment to enable or disable (depending on ALED) reporting for the specified Alarm ID in S5F1, S5F8, S5F71, and S5F73.

**<L [2]**

**<B [1] ALED>** \* ALED – Alarm Enable/Disable Code

**<U4 ALID>** \* ALID – Alarm ID

**> .**

ALED has the following values:

* 0x80 Enable sending alarm.
* 0x00 Disable sending alarm.

The following special format can be used to enable or disable all ALIDs.

**S5F3 [W]** \* H->E

**<L [2]**

**<B [1] ALED>** \* ALED – Alarm Enable/Disable Code

**<U4>** \* ALID – Alarm ID

**> .**

* The Host may optionally set the W-Bit to “1” in S5F3. If so, the Equipment replies with S5F4.

**S5,F4 Enable/Disable Alarm Acknowledge S, H<-E**

The Equipment responds.

**<B [1] ACKC5> .** \* ACKC5 – Acknowledge Code

ACKC5 has the following values:

* **0x00** Normal. Everything Correct
* **0x01** Invalid ALID

**S5,F5 List Alarms Request S, H->E, reply**

The Host requests the Equipment to send the current status of the specified Alarm IDs.

**<U4 ALID ...> .** \* Alarm ID Array

The Host can use the following special format to request the status of all Alarm IDs:

S5F5 W

<U4>. \* ALID

**S5,F6 List Alarm Data M, H<-E**

The high-order bit of ALCD will be “1” if this alarm is currently On (Unsafe), or “0” if it is currently Off (Safe).

**<L**

**<L [3]**

**<B [1] ALCD>** \* ALCD – Alarm On/Off and Severity Code

**<U4 ALID>** \* Alarm ID

**<A ALTX>** \* ALTX – Alarm Text

**>**

**...**

**> .**

For any invalid ALID specified in S5F5, the corresponding entry in S5F6 has the following special error format:

**<L [3]**

**<B>** \* ALCD – alarm On/Off

**<U4 ALID>** \* Alarm ID

**<A>** \* ALTX – Alarm Text

**>**

* If S5F5 specified all alarms, S5F6 reports alarms in order by alarm ID.

## Stream 6: Data Collection

**S6,F1 Trace Data Send S, H<-E**

**<L [4]**

**<U4 TRID>**

**<U4 SMPLN>**

**<A STIME>**

**<L [n]**

**<SV>**

**…**

|  |  |  |
| --- | --- | --- |
| **>** |  | |
| **>** |
| **S6,F2** | **Trace Data Acknowledge** | **S, H->E** |
| **<Bi ACKC6>** |  |  |
| **S6,F11** | **Event Report Send** | **M,H<-E, reply** |

This message is the normal message that the Equipment uses to report events.

**<L [3]**

**<U4 DATAID>** \* DATAID

**<U4 CEID>** \* Collection Event ID

**<L**

**<L [2]**

**<U4 RPTID>** \* Report ID

**<L**

**>**

**...**

**>**

**> .**

**...**

**>**

**<V>** \* Variable Value

* A Collection Event has occurred at the Equipment. The Host has enabled event reporting for this CEID (see S2F37). The Equipment sends one or more Event Reports which the Host has previously linked to that CEID (see S2F35). Each report contains specific Variables which the Host has previously defined for that Report (see S2F33).
* The Equipment generates a value for DATAID to uniquely identify this Conversation.

If the CEID is enabled, but no Reports are linked to this CEID, S6F11 has the following special format:

**S6F11 W** \* H<-E

**<L [3]**

**<U4 DATAID>** \* DATAID

**<U4 CEID>** \* Collection Event ID

**<L>**

**> .**

**S6,F12 Event Report Acknowledge S, H->E**

The Host acknowledges the Event Report. The Equipment ignores ACKC6.

**<B [1] 00> .** \* ACKC6

**S6,F15 Event Report Request S,H->E, reply**

The Host sends the CEID of interest, requesting normal format reports.

**<U4 CEID> .** \* Collection Event ID

**S6,F16 Event Report Data M,H<-E**

The Equipment sends one or more Event Reports which the Host has previously linked to that CEID (see S2F35). Each report contains specific Variables which the Host has previously defined for that Report (see S2F33).

**<L [3]**

**<U4 DATAID>** \* DATAID

**<U4 CEID>** \* Collection Event ID

**<L**

**<L [2]**

**<U4 RPTID>** \* Report ID

**<L**

**>**

**>**

**...**

**>**

**> .**

**<V>** \* Variable Value

**...**

* This message occurs whether or not the Host has enabled event reporting for this CEID (see S2F37), and regardless of how the Host has set the Equipment Constant RpType (report format).
* The Equipment generates a meaningless value for DATAID.
* CEID contains the CEID specified in S6F15.

If the CEID specified in S6F15 is invalid, or if no reports are linked to this CEID, this message has the following special format:

**S6F16** \* H<-E, Multiblock

**<L [3]**

**<U4 DATAID>** \* DATAID

**<U4 CEID>** \* Collection Event ID

**<L>**

**> .**

**S6,F19 Request Report Request S,H->E, reply**

The Host requests a Report for the specified RPTID.

**<U4 RPTID> .** \* Report ID

**S6,F20 Request Report Data M,H<-E**

The Equipment sends the Report.

**<L**

**...**

**> .**

**<V>**

If no report is defined for the RPTID in S6F19, S6F20 has the following special error format:

**S6F20** \* H<-E

**<L> .**

## Stream 7: Process Program Management

**S7,F1 Process Program Acknowledge S,H<->E**

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

**<L [2]**

**<A PPID>**

**<U4 LENGTH>**

**S7,F2 Process Program Load Grant M,H↔E**

**<B PPGNT>**

**S7,F17 Process Program Delete S,H->E**

The Host deletes one or more Process Programs from the Equipment library.

<**L**

**<A PPID>** \* Process Program ID

...

> .

* If S7F17 contains a zero-length List, the entire library is deleted.

**S7,F18 Process Program Delete Acknowledge S,H<-E**

The Equipment acknowledges the Process Program delete.

**<B [1] ACKC7>** . \* ACKC7 – Acknowledge Code

* **0x00** – Normal. All specified PPIDs have been deleted.
* **0x01** – Permission not granted.

**S7,F19 Process Program Directory Request S,H->E**

The Host requests a directory of the Process Programs currently in the Equipment library.

**S7,F20 Process Program Directory S,H<-E**

The Equipment sends a directory of its Process Program library. If the library is empty, the list will be zero length.

**<L**

**...**

**>** **.**

**<A PPID>** \* Process Program ID

|  |  |  |
| --- | --- | --- |
| **S7,F23** | **Formatted Process Program Send** | **S,H↔E** |
| **<L [4]** |  |  |
| **<A PPID>** |  |  |
| **<A MDLN>** | *\* MDLN Model Number* |  |
| **<A SOFTREV>** | *\* SOFTREV Software Revision* |  |
| **<L [m]** |  |  |

**<L [2]**

**<A CCODE> *\**** *Process Operation Command Code*

**<L [n]**

**<A PPARM> *\**** *Process Parameter*

**…**

**>**

**>**

**…**

**>**

**>.**

**S7,F24 Formatted Process Program Acknowledge S,H↔E**

**<B[1] ACKC10>**

**S7,F25 Formatted Process Program Request S,H↔E**

**<A PPID>**

**S7,F26 Formatted Process Program Data S,H↔E**

**<L [4]**

**<A PPID>**

**<A MDLN>** *\* MDLN Model Number*

**<A SOFTREV>** *\* SOFTREV Software Revision*

**<L [m]**

**<L [2]**

**<A CCODE> *\**** *Process Operation Command Code*

**<L [n]**

**<A PPARM> *\**** *Process Parameter*

**…**

**>**

**>**

**…**

**>**

**>**

## Stream 9: System Errors

|  |  |  |
| --- | --- | --- |
| **S9,F1** | **Unrecognized Device ID** | **S, H<-E** |
| **<B [10] MHEAD> .** | \* MHEAD – Header of bad msg |  |
| **S9,F3** | **Unrecognized Stream** | **S, H<-E** |
| **<B [10] MHEAD> .** | \* MHEAD – Header of bad msg |  |
| **S9,F5** | **Unrecognized Function** | **S, H<-E** |
| **<B [10] MHEAD> .** | \* MHEAD – Header of bad msg |  |
| **S9,F7** | **Invalid Data** | **S, H<-E** |
| **<B [10] MHEAD> .** | \* MHEAD – Header of bad msg |  |
| **S9,F9** | **Transaction Timer Timeout** | **S, H<-E** |
| **<B [10] SHEAD> .** | \* SHEAD – Stored Header |  |
| **S9,F11** | **Data Too Long** | **S, H<-E** |
| **<B [10] MHEAD> .** | \* MHEAD – Header of bad msg |  |
| **S9,F13** | **Conversation Timeout** | **S, H<-E** |

Data were expected but none were received in a reasonable length of time. Resources have been cleared.

**<L [2]**

**<MEXP>**

**<EDID>**

## Stream 10: Terminal Services

**S10,F1 Terminal Request S,H<-E**

A terminal text message to the host.

**<L [2]**

**<B TID>**

**<A TEXT>**

|  |  |  |
| --- | --- | --- |
| **>.** |  | |
| **S10,F2** | **Terminal Request** | **S,H->E** |
| **<B[1] ACKC10>** |  |  |
| **S10,F3** | **Terminal Display** | **S,H->E** |

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

**<L [2]**

**<B TID>**

**<A TEXT>**

**>.**

**S10,F4 Terminal Display S,H<-E**

**<B[1] ACKC10>**

# - Variable Item Dictionary

This chapter describes the variables, constants, collection events, and alarms available on the Equipment. The following information is included in each description.

* **ID**: A unique identifier for the item; a VID, CEID or ALID.
* **Name**: The unique name of the item.
* **Format**: The SECS format of the item (Status Variables, data values, and Equipment Constants only).
* **Description**: A description of the data item, which may include the meanings of specific values; any applicable minimum, maximum, or default values; any applicable units of measure; maximum size (for text values); or conditions for occurrence.

## Data Types

The following table describes the data types available for the variable and data dictionary items.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **SML**  **Notation** | **VID List Notation** | **Format** | **Octal** | **Decimal** | **Type** |
| L | List | LIST | 00 | 00 | List |
| B | BinaryData | BINARY | 10 | 8 | Binary |
| BOOLEAN | Boolean | BOOLEAN | 11 | 9 | Boolean |
| A | StringData | ASCII | 20 | 16 | ASCII |
| I1 | Signed Byte | INT\_1 | 31 | 25 | Signed integer, 1 bytes |
| I2 | Signed Short | INT\_2 | 32 | 26 | Signed integer, 2 bytes (most significant byte first) |
| I4 | Signed Integer | INT\_4 | 34 | 28 | Signed integer, 4 bytes (most significant byte first) |
| F8 | Double | FT\_8 | 40 | 32 | Floating point, 8 bytes (IEEE 754 format – byte containing sign bit first) |
| F4 | Float | FT\_4 | 44 | 36 | Floating point, 4 bytes (IEEE 754 format – byte containing sign bit first) |
| U1 | Unsigned Byte | UINT\_1 | 51 | 41 | Unsigned integer, 1 bytes |
| U2 | Unsigned Short | UINT\_2 | 52 | 42 | Unsigned integer, 2 bytes (most significant byte first) |
| U4 | Unsigned Integer | UINT\_4 | 54 | 44 | Unsigned integer, 4 bytes (most significant byte first) |

## Status Variables

For detailed descriptions for all the standard GEM and E116 Status Variables, please refer to the appropriate chapter covering that functionality.

|  |  |  |  |
| --- | --- | --- | --- |
| **VID** | **Name** | **Description** | **Format** |
| **1** | \_LICENSE\_CODE\_SVID\_ | License Code | **A** |
| **2** | \_LICENSE\_STATUS\_SVID\_ | License Status | **U1** |
| **5** | \_GEM\_LINK\_STATE\_ | GemLinkState | **U1** |
| **6** | \_GEM\_COMM\_MODE\_ | SECSCommunicationMode | **U1** |
| **11** | \_GEM\_PREVIOUS\_CEID\_ | GemPreviousCEID | **U4** |
| **12** | \_GEM\_OFF\_LINE\_SUB\_STATE\_  SV\_ | GemOffLineSubState | **U1** |
| **13** | \_GEM\_PREVIOUS\_CONTROL\_S  TATE\_ | GemPreviousControlState | **U1** |
| **14** | \_GEM\_PREVIOUS\_PROCESS\_S  TATE\_ | GemPreviousProcessState | **U1** |
| **15** | \_GEM\_PROCESS\_STATE\_ | GemProcessState | **U1** |
| **24** | \_GEM\_MDLN\_ | GemMDLN | **A** |
| **25** | \_GEM\_SOFTREV\_ | GemSOFTREV | **A** |
| **39** | \_GEM\_ALARM\_ENABLED\_ | L GemAlarmsEnabled | **L** |
| **40** | \_GEM\_ALARM\_SET\_ | L GemAlarmSet | **L** |
| **41** | \_GEM\_EVENT\_ENABLED\_ | L GemEventsEnabled | **L** |
| **42** | \_GEM\_PP\_EXEC\_NAME\_ | GemPPExecName | **A** |
| **43** | \_PP\_FORMAT\_ | PPFormat | **U1** |
| **53** | \_GEM\_SPOOL\_COUNT\_ACTUAL  \_ | GemSpoolCountActual | **U4** |
| **54** | \_GEM\_SPOOL\_COUNT\_TOTAL\_ | GemSpoolCountTotal | **U4** |
| **55** | \_GEM\_SPOOL\_FULL\_TIME\_ | GemSpoolFullTime | **A** |
| **57** | \_GEM\_SPOOL\_START\_TIME\_ | GemSpoolStartTime | **A** |
| **58** | \_GEM\_SPOOL\_STATE\_ | GemSpoolState | **U1** |
| **80** | \_GEM\_SOFTWARE\_REVISION\_ | Gem Soft Ware Revision | **A** |
| **3** | GemClock | QuickGEM 系统时间，时间格式依  EC:68(GemTimeFormat)而定 | **A** |
| **4** | GemControlState | 1=EqOffline2=WaitOnline3=HostOffline4=OnlineLocal 5=OnlineRemote | **U1** |
| **10001** | CurrentPPID | 当前配方名称 | **A** |
| **10002** | CurrentLotID | 当前批号 | **A** |
| **10003** | CurrentLotQty | 当前批号数量 | **A** |
| **10008** | TC01\_SV | 第 01 槽電熱溫度設定 SV | **F4** |

|  |  |  |  |
| --- | --- | --- | --- |
| **10009** | TC02\_SV | 第 02 槽電熱溫度設定SV | **F4** |
| **10010** | TC03\_SV | 第 03 槽電熱溫度設定SV | **F4** |
| **10011** | TC04\_SV | 第 04 槽電熱溫度設定 SV | **F4** |
| **10012** | TC05\_SV | 第 05 槽電熱溫度設定SV | **F4** |
| **10032** | TC01\_PV | 第 01 槽電熱實際溫度PV | **F4** |
| **10033** | TC02\_PV | 第 02 槽電熱實際溫度PV | **F4** |
| **10034** | TC03\_PV | 第 03 槽電熱實際溫度PV | **F4** |
| **10035** | TC04\_PV | 第 04 槽電熱實際溫度PV | **F4** |
| **10036** | TC05\_PV | 第 05 槽電熱實際溫度PV | **F4** |
| **10056** | WindSpeed01\_PV | 第 01 槽風壓檢知PV | **F4** |
| **10057** | WindSpeed02\_PV | 第 02 槽風壓檢知PV | **F4** |
| **10058** | WindSpeed03\_PV | 第 03 槽風壓檢知PV | **F4** |
| **10059** | WindSpeed04\_PV | 第 04 槽風壓檢知PV | **F4** |
| **10060** | WindSpeed05\_PV | 第 05 槽風壓檢知PV | **F4** |
| **10080** | EquipmentKWH | 设备总耗电量 | **F4** |
| **20001** | EquipmentState | 0:停机(STOP)、1:自动(IDLE)、2:自动启动(RUN)、3:异常  (DOWN)、4:保养(PM) | **U2** |
| **20002** | ProcessState | 0:手动、1:升温中、2:恒温中、7:冷却降温中、9:自动 | **U2** |
| **20009** | FROMSTATUS | 蓝灯前个状态 1：灯灭，2：灯常亮，3：灯闪烁 | **A** |
| **20010** | TOSTATUS | 蓝灯当前状态 1：灯灭，2：灯常亮，3：灯闪烁 | **A** |
| **20011** | BuzzerSTATUS | 蜂鳴器当前状态 1：無聲，2：有聲， | **A** |
|  |  |  |  |
|  |  |  |  |

## Data Values

DVVALs only contain valid values when their associated event occurs. For detailed descriptions for all the standard GEM and E116 data values, please refer to the appropriate chapter covering that functionality.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ***VID*** | ***Name*** | ***Description*** | ***Format*** | ***Associated CEIDs*** |
| 9 | GemPPChangeName | GemPPChangeName | ASCII | GemProcessProgramChange(3) |
| 10 | GemPPChangeStatus | 1:Create, 2:Changed, 3:Deleded | UINT\_1 | GemProcessProgramChange(3) |
| 38 | GemAlarmID | GEM\_BLARM\_ID | UINT\_4 | AlarmSet(100), AlarmClear(101) |
| 46 | GemECIDChanged | GemECIDChanged | UINT\_4 | GemEqConstChanged(20) |
| 47 | ECValueChanged | ECValueChanged | ASCII | GemEqConstChanged(20) |
| 48 | PreviousECValue | PreviousECValue | ASCII | GemEqConstChanged(20) |
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## Equipment Constants

For detailed descriptions for all the standard GEM and E116 Equipment Constants, please refer to the appropriate chapter covering that functionality.

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| --- | --- | --- | --- | --- | --- | --- |
| ***VID*** | ***Name*** | ***Description*** | ***INIT*** | ***Min*** | ***Max*** | ***Format*** |
| 7 | GemInitCommState | 0:Disable, 1:Enable | 0 | 0 | 1 | UINT\_1 |
| 8 | GemInitControlState | 1:OffLine, 2:OnLine | 1 | 1 | 2 | UINT\_1 |
| 21 | GemWBitS5 | 0:Not Set, 1:Set (for send S5Fx ) | 1 | 0 | 1 | UINT\_1 |
| 22 | GemWBitS6 | 0:Not Set, 1:Set (for send S6F11 ) | 1 | 0 | 1 | UINT\_1 |
| 23 | GemWBitS10 | 0:Not Set, 1:Set (for send S10F1) | 1 | 0 | 1 | UINT\_1 |
| 44 | GemEstabCommDelay |  | 5 | 1 | 10000 | UINT\_2 |
| 49 | GemOffLineSubstate | 1:Eqp. OFF-line , 2:Attempt On-line , 3:Host  Off-line | 1 | 1 | 3 | UINT\_1 |
| 50 | GemOnLineFailed | 1:Eqp. OFF-line , 2: Undefined-DO NOT USE,  3:Host Off-line | 1 | 1 | 3 | UINT\_1 |
| 51 | GemOnLineSubstate | 4:On-line/Local, 5:ON-line/Remote | 4 | 4 | 5 | UINT\_1 |
| 52 | GemMaxSpoolTransmit |  | 100 | 1 | 2E+08 | UINT\_4 |
| 66 | GemConfigSpool | 0:Disable, 1:Enable | 0 | 0 | 1 | UINT\_1 |
| 67 | GemOverWriteSpool | 1:Overwrite, 0:Do not overwrite | 0 | 0 | 1 | BOOLEAN |
| 68 | GemTimeFormat | 0:12-bytes, 1:16-bytes, 2:14-bytes,  3:ISO8601 format | 1 | 0 | 3 | UINT\_1 |
| 71 | GemDATAIDFormat | 1:INT\_1, 2:INT\_2, 3:INT\_4, 4:UINT\_1,  5:UINT\_2, 6:UINT\_4 (for send S6F11) | 5 | 1 | 6 | UINT\_1 |
| 75 | GemSAMPLNFormat | 1:INT\_1, 2:INT\_2, 3:INT\_4, 4:UINT\_1,  5:UINT\_2, 6:UINT\_4 (for send S6F1) | 5 | 1 | 6 | UINT\_1 |
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## Collection Events

For detailed descriptions for all the standard GEM and E116 collection events, please refer to the appropriate chapter covering that functionality.

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| --- | --- | --- | --- |
| CEID | Name | Description | Associated VIDs |
| 3 | GemProcessProgramChange | A process program (recipe) has been created  changed or deleted. | GemPPChangeName(9), GemPPChangeStatus(10) |
| 8 | GemControlStateLocal | Notify Host of control state change to Local | GemControlState(4), GemPreviousControlState(13) |
| 9 | GemControlStateRemote | Notify Host of control state change to Remote | GemControlState(4), GemPreviousControlState  (13) |
| 20 | GemEqConstChanged | Equipment constant changed | GemECIDChanged (46) |
| 21 | GemMessageRecognition | GemMessageRecognition |  |
| 22 | GemEqpOffLine | Notify Host of impending state change to Off-Line. | GemLinkState (5) |
| 23 | GemSpoolingActived | Notify Host of spooling  state change to actived. | GemSpoolState (58) |
| 24 | GemSpoolingInactived | Notify Host of spooling  state change to inactive. | GemSpoolState (58) |
| 25 | GemSpoolTransmitFailure | Notify Host of spool  transmit has been failue. |  |

## Alarms

Each alarm has its own AlarmEventOn and AlarmEventOff Collection Events.

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| --- | --- | --- | --- | --- |
| **Sequence** | **Alarm ID** | **Alarm Type** | **Alarm Text Chinese** | **Alarm Text English** |
| 1 | 50000 | 重大 | 緊急停止開關復歸要求 | Emergency Stop Switch Reset Request |
| 2 | 50001 | 重大 | 進料緊急停止開關壓下 | Load Emergency Stop Switch Trigger |
| 3 | 50002 | 重大 | （F002） | （F002） |
| 4 | 50003 | 重大 | 出料緊急停止開關壓下 | Unload Emergency Stop Switch Trigger |
| 5 | 50004 | 重大 | 電源相序異常 | Power Phase Sequence Error |
| 6 | 50005 | 重大 | （F005） | （F005） |
| 7 | 50006 | 重大 | （F006） | （F006） |
| 8 | 50007 | 重大 | （F007） | （F007） |
| 9 | 50008 | 重大 | （F008） | （F008） |
| 10 | 50009 | 重大 | （F009） | （F009） |
| 11 | 50010 | 重大 | 進料空壓異常 | Load Air Source Error |
| 12 | 50011 | 重大 | （F011） | （F011） |
| 13 | 50012 | 重大 | 出料空壓異常 | Unload Air Source Error |
| 14 | 50013 | 重大 | （F013） | （F013） |
| 15 | 50014 | 重大 | （F014） | （F014） |
| 16 | 50015 | 重大 | （F015） | （F015） |
| 17 | 50016 | 重大 | 第 1 槽 電熱箱超溫防止器異常 | No.1 Heater O.T.P. Error |
| 18 | 50017 | 重大 | 第 2 槽 電熱箱超溫防止器異常 | No.2 Heater O.T.P. Error |

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| 19 | 50018 | 重大 | 第 3 槽 電熱箱超溫防止器異常 | No.3 Heater O.T.P. Error |
| 20 | 50019 | 重大 | 第 4 槽 電熱箱超溫防止器異常 | No.4 Heater O.T.P. Error |
| 21 | 50020 | 重大 | 第 5 槽 電熱箱超溫防止器異常 | No.5 Heater O.T.P. Error |
| 22 | 50021 | 重大 | 第 6 槽 電熱箱超溫防止器異常 | No.6 Heater O.T.P. Error |
| 23 | 50048 | 重大 | （F048） | （F048） |
| 24 | 50049 | 重大 | （F049） | （F049） |
| 25 | 50050 | 重大 | （F050） | （F050） |
| 26 | 50051 | 重大 | （F051） | （F051） |
| 27 | 50052 | 重大 | （F052） | （F052） |
| 28 | 50053 | 重大 | （F053） | （F053） |
| 29 | 50054 | 重大 | （F054） | （F054） |
| 30 | 50055 | 重大 | （F055） | （F055） |
| 31 | 50056 | 重大 | （F056） | （F056） |
| 32 | 50057 | 重大 | （F057） | （F057） |
| 33 | 50058 | 重大 | （F058） | （F058） |
| 34 | 50059 | 重大 | （F059） | （F059） |
| 35 | 50060 | 重大 | （F060） | （F060） |
| 36 | 50061 | 重大 | （F061） | （F061） |
| 37 | 50062 | 重大 | （F062） | （F062） |
| 38 | 50063 | 重大 | （F063） | （F063） |
| 39 | 50064 | 重大 | 進料平台整板伺服馬達異常 | Load Plateform Alignment Servo Motor Error |
| 40 | 50065 | 重大 | 進料平台整板伺服馬達前極限異常 | Load Plateform Alignment Servo Motor Front Limit Error |
| 41 | 50066 | 重大 | 進料平台整板伺服馬達後極限異常 | Load Plateform Alignment |

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| --- | --- | --- | --- | --- |
|  |  |  |  | Servo Motor Rear Limit Error |
| 42 | 50067 | 重大 | 進料平台整板伺服原點復歸異常 | Load Plateform Alignment Servo Motor Origin Error |
| 43 | 50068 | 重大 | 進料平台整板伺服至拍定點移動異常 | Load Plateform Alignment Servo Motor Pat Position Error |
| 44 | 50069 | 重大 | 進料平台整板伺服至開定點移動異常 | Load Plateform Alignment Servo Motor Open Position Error |
| 45 | 50070 | 預警 | 進料輸送皮帶變頻器 INV-A1 異常 | Load Conveyor Inveter-A1 Error |
| 46 | 50071 | 預警 | 進料平台壓板-左氣缸開定點異常 | Load Plateform Press Plate,Left Cylinder Open Position Error |
| 47 | 50072 | 預警 | 進料平台壓板-左氣缸壓定點異常 | Load Plateform Press Plate,Left Cylinder Press Position Error |
| 48 | 50073 | 重大 | 進料平台壓板-左氣缸檢知異常 | Load Plateform Press Plate,Left Cylinder Sensor Error |
| 49 | 50074 | 重大 | 進料平台壓板-右氣缸開定點異常 | Load Plateform Press Plate,Right Cylinder Open Position Error |
| 50 | 50075 | 重大 | 進料平台壓板-右氣缸壓定點異常 | Load Plateform Press Plate,Right Cylinder Press Position Error |
| 51 | 50076 | 重大 | 進料平台壓板-右氣缸檢知異常 | Load Plateform Press Plate,Right Cylinder Sensor Error |
| 52 | 50077 | 重大 | 進料平台前後拍板-前左氣缸開定點異常 | Load Plateform Front&Rear Pat Plate,Front Left Cylinder Open Position Error |
| 53 | 50078 | 重大 | 進料平台前後拍板-前左氣缸拍定點異常 | Load Plateform Front&Rear Pat Plate,Front Left Cylinder Pat Position Error |
| 54 | 50079 | 重大 | 進料平台前後拍板-前左氣缸檢知異常 | Load Plateform Front&Rear Pat Plate,Front Left Cylinder Sensor Error |
| 55 | 50080 | 重大 | 進料平台前後拍板-前右氣缸開定點異常 | Load Plateform Front&Rear  Pat Plate,Front Right Cylinder Open Position |

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| --- | --- | --- | --- | --- |
|  |  |  |  | Error |
| 56 | 50081 | 重大 | 進料平台前後拍板-前右氣缸拍定點異常 | Load Plateform Front&Rear Pat Plate,Front Right Cylinder Pat Position Error |
| 57 | 50082 | 重大 | 進料平台前後拍板-前右氣缸檢知異常 | Load Plateform Front&Rear Pat Plate,Front Right Cylinder Sensor Error |
| 58 | 50083 | 重大 | 進料平台前後拍板-後氣缸開定點異常 | Load Plateform Front&Rear Pat Plate,Rear Cylinder Open Position Error |
| 59 | 50084 | 重大 | 進料平台前後拍板-後氣缸拍定點異常 | Load Plateform Front&Rear Pat Plate,Rear Cylinder Pat Position Error |
| 60 | 50085 | 重大 | 進料平台前後拍板-後氣缸檢知異常 | Load Plateform Front&Rear Pat Plate,Rear Cylinder Sensor Error |
| 61 | 50086 | 重大 | 進料平台昇降-氣缸伸(上)定點異常 | Load Plateform Elevator Cylinder Up Position Error |
| 62 | 50087 | 重大 | 進料平台昇降-氣缸縮(下)定點異常 | Load Plateform Elevator Cylinder Down Position Error |
| 63 | 50088 | 重大 | 進料平台昇降-氣缸檢知異常 | Load Plateform Elevator Cylinder Sensor Error |
| 64 | 50089 | 重大 | 進料平台前後拍板-後右氣缸開定點異常 | (F089)Load Plateform Front&Rear Pat Plate-Rear Right Cylinder Open Position Error |
| 65 | 50090 | 重大 | 進料平台前後拍板-後右氣缸拍定點異常 | (F090)Load Plateform Front&Rear Pat Plate-Rear Right Cylinder Pat Position Error |
| 66 | 50091 | 重大 | 進料平台前後拍板-後右氣缸檢知異常 | (F091)Load Plateform Front&Rear Pat Plate-Rear Right Cylinder Sensor Error |
| 67 | 50092 | 重大 | （F092） | （F092） |
| 68 | 50093 | 重大 | （F093） | （F093） |
| 69 | 50094 | 重大 | （F094） | （F094） |
| 70 | 50095 | 重大 | （F095） | （F095） |

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| --- | --- | --- | --- | --- |
| 71 | 50096 | 重大 | （F096） | （F096） |
| 72 | 50097 | 重大 | （F097） | （F097） |
| 73 | 50098 | 重大 | （F098） | （F098） |
| 74 | 50099 | 重大 | （F099） | （F099） |
| 75 | 50100 | 重大 | （F100） | （F100） |
| 76 | 50101 | 重大 | （F101） | （F101） |
| 77 | 50102 | 重大 | （F102） | （F102） |
| 78 | 50103 | 重大 | （F103） | （F103） |
| 79 | 50104 | 重大 | （F104） | （F104） |
| 80 | 50105 | 重大 | （F105） | （F105） |
| 81 | 50106 | 重大 | （F106） | （F106） |
| 82 | 50107 | 重大 | （F107） | （F107） |
| 83 | 50108 | 重大 | （F108） | （F108） |
| 84 | 50109 | 重大 | （F109） | （F109） |
| 85 | 50110 | 重大 | （F110） | （F110） |
| 86 | 50111 | 重大 | （F111） | （F111） |
| 87 | 50112 | 重大 | 進料手臂移載伺服馬達異常 | Load Arm Transfer Servo Motor Error |
| 88 | 50113 | 重大 | 進料手臂移載伺服馬達前極限異常 | Load Arm Transfer Servo Motor Front Limit Error |
| 89 | 50114 | 重大 | 進料手臂移載伺服馬達後極限異常 | Load Arm Transfer Servo Motor Rear Limit Error |
| 90 | 50115 | 重大 | 進料手臂移載伺服馬達原點復歸異常 | Load Arm Transfer Servo Motor Origin Error |
| 91 | 50116 | 重大 | 進料手臂移載伺服至取板定點異常 | Load Arm Transfer Servo Motor Take Position Error |
| 92 | 50117 | 重大 | 進料手臂移載伺服至旋轉定點異常 | Load Arm Transfer Servo Motor Rotation Position |

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| --- | --- | --- | --- | --- |
|  |  |  |  | Error |
| 93 | 50118 | 重大 | 進料手臂移載伺服至放板定點異常 | Load Arm Transfer Servo Motor Put Position Error |
| 94 | 50119 | 重大 | 進料手臂昇降伺服馬達異常 | Load Arm Elevator Servo Motor Error |
| 95 | 50120 | 重大 | 進料手臂昇降伺服馬達上極限異常 | Load Arm Elevator Servo Motor Up Limit Error |
| 96 | 50121 | 重大 | 進料手臂昇降伺服馬達下極限異常 | Load Arm Elevator Servo Motor Down Limit Error |
| 97 | 50122 | 重大 | 進料手臂昇降伺服馬達原點復歸異常 | Load Arm Elevator Servo Motor Origin Error |
| 98 | 50123 | 重大 | 進料手臂昇降伺服至夾板定點異常 | Load Arm Elevator Servo Motor Claw Close Position Error |
| 99 | 50124 | 重大 | 進料手臂昇降伺服至夾板上定點異常 | Load Arm Elevator Servo Motor Claw Close\_Up Position Error |
| 100 | 50125 | 重大 | 進料手臂昇降伺服至移載定點異常 | Load Arm Elevator Servo Motor Transfer Position Error |
| 101 | 50126 | 重大 | 進料手臂昇降伺服至放板定點異常 | Load Arm Elevator Servo Motor Put Position Error |
| 102 | 50127 | 重大 | 進料手臂旋轉伺服馬達異常 | Load Arm Rotation Servo Motor Error |
| 103 | 50128 | 重大 | 進料手臂旋轉伺服馬達前極限異常 | Load Arm Rotation Servo Motor Front Limit Error |
| 104 | 50129 | 重大 | 進料手臂旋轉伺服馬達後極限異常 | Load Arm Rotation Servo Motor Rear Limit Error |
| 105 | 50130 | 重大 | 進料手臂旋轉伺服馬達原點復歸異常 | Load Arm Rotation Servo Motor Origin Error |
| 106 | 50131 | 重大 | 進料手臂旋轉伺服至垂直定點異常 | Load Arm Rotation Servo Motor Vertical Position Error |
| 107 | 50132 | 重大 | 進料手臂旋轉伺服至水平定點異常 | Load Arm Rotation Servo Motor Horizontal Position Error |
| 108 | 50133 | 重大 | 進料手臂夾爪伸縮伺服馬達異常 | Load Arm Stretch Servo Motor Error |
| 109 | 50134 | 重大 | 進料手臂夾爪伸縮伺服馬達前極限異常 | Load Arm Stretch Servo Motor Front Limit Error |

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| 110 | 50135 | 重大 | 進料手臂夾爪伸縮伺服馬達後極限異常 | Load Arm Stretch Servo Motor Rear Limit Error |
| 111 | 50136 | 重大 | 進料手臂夾爪伸縮伺服馬達原點復歸異常 | Load Arm Stretch Servo Motor Origin Error |
| 112 | 50137 | 重大 | 進料手臂夾爪伸縮伺服至設定點異常 | Load Arm Stretch Servo Motor Set Position Error |
| 113 | 50138 | 重大 | 進料手臂夾爪伸縮伺服至攤平定點異常 | Load Arm Stretch Servo Motor Flattening Position Error |
| 114 | 50139 | 重大 | 進料手臂夾爪伸縮伺服至開定點異常 | Load Arm Stretch Servo Motor Open Position Error |
| 115 | 50140 | 重大 | 進料手臂左夾爪-左上氣缸開定點異常 | Load Arm Claw-Left Up Cylinder Open Position Error |
| 116 | 50141 | 重大 | 進料手臂左夾爪-左上氣缸夾定點異常 | Load Arm Claw-Left Up Cylinder Close Position Error |
| 117 | 50142 | 重大 | 進料手臂左夾爪-左上氣缸檢知異常 | Load Arm Claw-Left Up Cylinder Sensor Error |
| 118 | 50143 | 重大 | 進料手臂左夾爪-左下氣缸開定點異常 | Load Arm Claw-Left Down Cylinder Open Position Error |
| 119 | 50144 | 重大 | 進料手臂左夾爪-左下氣缸夾定點異常 | Load Arm Claw-Left Down Cylinder Close Position Error |
| 120 | 50145 | 重大 | 進料手臂左夾爪-左下氣缸檢知異常 | Load Arm Claw-Left Down Cylinder Sensor Error |
| 121 | 50146 | 重大 | 進料手臂右夾爪-右上氣缸開定點異常 | Load Arm Claw-Right Up Cylinder Open Position Error |
| 122 | 50147 | 重大 | 進料手臂右夾爪-右上氣缸夾定點異常 | Load Arm Claw-Right Up Cylinder Close Position Error |
| 123 | 50148 | 重大 | 進料手臂右夾爪-右上氣缸檢知異常 | Load Arm Claw-Right Up Cylinder Sensor Error |
| 124 | 50149 | 重大 | 進料手臂右夾爪-右下氣缸開定點異常 | Load Arm Claw-Right Down Cylinder Open Position Error |
| 125 | 50150 | 重大 | 進料手臂右夾爪-右下氣缸夾定點 | Load Arm Claw-Right Down |

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| --- | --- | --- | --- | --- |
|  |  |  | 異常 | Cylinder Close Position Error |
| 126 | 50151 | 重大 | 進料手臂右夾爪-右下氣缸檢知異常 | Load Arm Claw-Right Down Cylinder Sensor Error |
| 127 | 50152 | 重大 | （F152） | （F152） |
| 128 | 50153 | 重大 | （F153） | （F153） |
| 129 | 50154 | 重大 | （F154） | （F154） |
| 130 | 50155 | 重大 | （F155） | （F155） |
| 131 | 50156 | 重大 | （F156） | （F156） |
| 132 | 50157 | 重大 | （F157） | （F157） |
| 133 | 50158 | 重大 | （F158） | （F158） |
| 134 | 50159 | 重大 | （F159） | （F159） |
| 135 | 50160 | 重大 | 回流整框平台氣缸上定點異常 | Reflow Alignment Frame Plateform Elevator Up Position Error |
| 136 | 50161 | 重大 | 回流整框平台氣缸下定點異常 | Reflow Alignment Frame Plateform Elevator Down Position Error |
| 137 | 50162 | 重大 | 回流整框平台氣缸檢知異常 | Reflow Alignment Frame Plateform Elevator Sensor Error |
| 138 | 50163 | 重大 | 回流整框-前後拍框-前氣缸開定點異常 | Reflow Alignment Frame- Front Rear Pat,Front Cylinder Open Position Error |
| 139 | 50164 | 重大 | 回流整框-前後拍框-前氣缸拍定點異常 | Reflow Alignment Frame- Front Rear Pat,Front Cylinder Pat Position Error |
| 140 | 50165 | 重大 | 回流整框-前後拍框-前氣缸檢知異常 | Reflow Alignment Frame- Front Rear Pat,Front Cylinder Sensor Error |
| 141 | 50166 | 重大 | 回流整框-前後拍框-後氣缸開定點異常 | Reflow Alignment Frame- Front Rear Pat,Rear Cylinder Open Position Error |

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| 142 | 50167 | 重大 | 回流整框-前後拍框-後氣缸拍定點異常 | Reflow Alignment Frame- Front Rear Pat,Rear Cylinder Pat Position Error |
| 143 | 50168 | 重大 | 回流整框-前後拍框-後氣缸檢知異常 | Reflow Alignment Frame- Front Rear Pat,Rear Cylinder Sensor Error |
| 144 | 50169 | 重大 | 回流整框-左右拍框-左氣缸開定點異常 | Reflow Alignment Frame- Left Right Pat,Left Cylinder Open Position Error |
| 145 | 50170 | 重大 | 回流整框-左右拍框-左氣缸拍定點異常 | Reflow Alignment Frame- Left Right Pat,Left Cylinder Pat Position Error |
| 146 | 50171 | 重大 | 回流整框-左右拍框-左氣缸檢知異常 | Reflow Alignment Frame- Left Right Pat,Left Cylinder Sensor Error |
| 147 | 50172 | 重大 | 回流整框-左右拍框-右氣缸開定點異常 | Reflow Alignment Frame- Left Right Pat,Rightt Cylinder Open Position Error |
| 148 | 50173 | 重大 | 回流整框-左右拍框-右氣缸拍定點異常 | Reflow Alignment Frame- Left Right Pat,Right Cylinder Pat Position Error |
| 149 | 50174 | 重大 | 回流整框-左右拍框-右氣缸檢知異常 | Reflow Alignment Frame- Left Right Pat,Right Cylinder Sensor Error |
| 150 | 50175 | 重大 | （F175） | （F175） |
| 151 | 50176 | 重大 | 進料托框昇降伺服馬達異常 | Load Mount Frame Elevator Servo Motor Error |
| 152 | 50177 | 重大 | 進料托框昇降伺服馬達上極限異常 | Load Mount Frame Elevator Servo Motor Up Limit Error |
| 153 | 50178 | 重大 | 進料托框昇降伺服馬達下極限異常 | Load Mount Frame Elevator Servo Motor Down Limit Error |
| 154 | 50179 | 重大 | 進料托框昇降伺服馬達原點復歸異常 | Load Mount Frame Elevator Servo Motor Origin Error |
| 155 | 50180 | 重大 | 進料托框昇降伺服至上定點異常 | Load Mount Frame Elevator Servo Motor Up Position Error |
| 156 | 50181 | 重大 | 進料托框昇降伺服至放框定點異常 | Load Mount Frame Elevator Servo Motor Put Position Error |

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| 157 | 50182 | 重大 | 進料托框昇降伺服至縮回定點異常 | Load Mount Frame Elevator Servo Motor Extend Position Error |
| 158 | 50183 | 重大 | 進料托框昇降伺服至下定點異常 | Load Mount Frame Elevator Servo Motor Down Position Error |
| 159 | 50184 | 重大 | 進料托框伸縮-左氣缸伸定點異常 | Load Mount Frame Stretch- Left Cylinder Extend Position Error |
| 160 | 50185 | 重大 | 進料托框伸縮-左氣缸縮定點異常 | Load Mount Frame Stretch- Left Cylinder Retract Position Error |
| 161 | 50186 | 重大 | 進料托框伸縮-左氣缸檢知異常 | Load Mount Frame Stretch- Left Cylinder Sensor Error |
| 162 | 50187 | 重大 | 進料托框伸縮-右氣缸伸定點異常 | Load Mount Frame Stretch- Right Cylinder Extend Position Error |
| 163 | 50188 | 重大 | 進料托框伸縮-右氣缸縮定點異常 | Load Mount Frame Stretch- Right Cylinder Retract Position Error |
| 164 | 50189 | 重大 | 進料托框伸縮-右氣缸檢知異常 | Load Mount Frame Stretch- Right Cylinder Sensor Error |
| 165 | 50190 | 重大 | （F190） | （F190） |
| 166 | 50191 | 重大 | （F191） | （F191） |
| 167 | 50192 | 重大 | 進料固定框-左上氣缸夾定點異常 | Load Fixed Frame-Left Up Cylinder Close Position Error |
| 168 | 50193 | 重大 | 進料固定框-左上氣缸開定點異常 | Load Fixed Frame-Left Up Cylinder Open Position Error |
| 169 | 50194 | 重大 | 進料固定框-左上氣缸檢知異常 | Load Fixed Frame-Left Up Cylinder Sensor Error |
| 170 | 50195 | 重大 | 進料固定框-左下氣缸開定點異常 | Load Fixed Frame-Left Down Cylinder Open Position Error |
| 171 | 50196 | 重大 | 進料固定框-左下氣缸夾定點異常 | Load Fixed Frame-Left Down Cylinder Close Position Error |
| 172 | 50197 | 重大 | 進料固定框-左下氣缸檢知異常 | Load Fixed Frame-Left Down Cylinder Sensor Error |

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| 173 | 50198 | 重大 | 進料固定框-右上氣缸夾定點異常 | Load Fixed Frame-Right Up Cylinder Close Position Error |
| 174 | 50199 | 重大 | 進料固定框-右上氣缸開定點異常 | Load Fixed Frame-Right Up Cylinder Open Position Error |
| 175 | 50200 | 重大 | 進料固定框-右上氣缸檢知異常 | Load Fixed Frame-Right Up Cylinder Sensor Error |
| 176 | 50201 | 重大 | 進料固定框-右下氣缸開定點異常 | Load Fixed Frame-Right Down Cylinder Open Position Error |
| 177 | 50202 | 重大 | 進料固定框-右下氣缸夾定點異常 | Load Fixed Frame-Right Down Cylinder Close Position Error |
| 178 | 50203 | 重大 | 進料固定框-右下氣缸檢知異常 | Load Fixed Frame-Right Down Cylinder Sensor Error |
| 179 | 50204 | 重大 | 進料開框機構左上昇定點異常 | Load Open Frame Machine Left Elevator Cylinder Up Position Error |
| 180 | 50205 | 重大 | 進料開框機構左下降定點異常 | Load Open Frame Machine Left Elevator Cylinder Down Position Error |
| 181 | 50206 | 重大 | 進料開框機構左昇降檢知異常 | Load Open Frame Machine Left Elevator Cylinder Sensor Error |
| 182 | 50207 | 重大 | 進料開框機構右上昇定點異常 | Load Open Frame Machine Right Elevator Cylinder Up Position Error |
| 183 | 50208 | 重大 | 進料開框機構右下降定點異常 | Load Open Frame Machine Right Elevator Cylinder Down Position Error |
| 184 | 50209 | 重大 | 進料開框機構右昇降檢知異常 | Load Open Frame Machine Right Elevator Cylinder Sensor Error |
| 185 | 50210 | 重大 | 進料開框機構左伸出定點異常 | Load Open Frame Machine Left Stretch Cylinder Extend Position Error |
| 186 | 50211 | 重大 | 進料開框機構左縮回定點異常 | Load Open Frame Machine Left Stretch Cylinder Retract Position Error |
| 187 | 50212 | 重大 | 進料開框機構左伸縮檢知異常 | Load Open Frame Machine Left Stretch Cylinder Sensor |

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| 188 | 50213 | 重大 | 進料開框機構右伸出定點異常 | Load Open Frame Machine Right Stretch Cylinder Extend Position Error |
| 189 | 50214 | 重大 | 進料開框機構右縮回定點異常 | Load Open Frame Machine Right Stretch Cylinder Retract Position Error |
| 190 | 50215 | 重大 | 進料開框機構右伸縮檢知異常 | Load Open Frame Machine Right Stretch Cylinder Sensor Error |
| 191 | 50216 | 重大 | 進料開框機構開夾-左開定點異常 | Load Open Frame Machine Open Claw Cylinder Left Open Position Error |
| 192 | 50217 | 重大 | 進料開框機構開夾-左夾定點異常 | Load Open Frame Machine Open Claw Cylinder Left Close Position Error |
| 193 | 50218 | 重大 | 進料開框機構開夾-左檢知異常 | Load Open Frame Machine Open Claw Cylinder Left Sensor Error |
| 194 | 50219 | 重大 | 進料開框機構開夾-右開定點異常 | Load Open Frame Machine Open Claw Cylinder Right Open Position Error |
| 195 | 50220 | 重大 | 進料開框機構開夾-右夾定點異常 | Load Open Frame Machine Open Claw Cylinder Right Close Position Error |
| 196 | 50221 | 重大 | 進料開框機構開夾-右檢知異常 | Load Open Frame Machine Open Claw Cylinder Right Sensor Error |
| 197 | 50222 | 重大 | 進料開框機構開夾簧力偵測異常 | Load Open Frame Machine Open Claw, Spring Force Error |
| 198 | 50223 | 重大 | （F223） | （F223） |
| 199 | 50224 | 重大 | （F224） | （F224） |
| 200 | 50225 | 重大 | （F225） | （F225） |
| 201 | 50226 | 重大 | （F226） | （F226） |
| 202 | 50227 | 重大 | （F227） | （F227） |
| 203 | 50228 | 重大 | （F228） | （F228） |

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| 204 | 50229 | 重大 | （F229） | （F229） |
| 205 | 50230 | 重大 | （F230） | （F230） |
| 206 | 50231 | 重大 | （F231） | （F231） |
| 207 | 50232 | 重大 | （F232） | （F232） |
| 208 | 50233 | 重大 | （F233） | （F233） |
| 209 | 50234 | 重大 | （F234） | （F234） |
| 210 | 50235 | 重大 | （F235） | （F235） |
| 211 | 50236 | 重大 | （F236） | （F236） |
| 212 | 50237 | 重大 | （F237） | （F237） |
| 213 | 50238 | 重大 | （F238） | （F238） |
| 214 | 50239 | 重大 | （F239） | （F239） |
| 215 | 50240 | 重大 | （F240） | （F240） |
| 216 | 50241 | 重大 | （F241） | （F241） |
| 217 | 50242 | 重大 | （F242） | （F242） |
| 218 | 50243 | 重大 | （F243） | （F243） |
| 219 | 50244 | 重大 | 進料擺臂伺服馬達異常 | Load Swing Arm Servo Motor Error |
| 220 | 50245 | 重大 | 進料擺臂伺服馬達前極限異常 | Load Swing Arm Servo Motor Front Limit Error |
| 221 | 50246 | 重大 | 進料擺臂伺服馬達後極限異常 | Load Swing Arm Servo Motor Rear Limit Error |
| 222 | 50247 | 重大 | 進料擺臂伺服馬達原點復歸異常 | Load Swing Arm Servo Motor Origin Error |
| 223 | 50248 | 重大 | 進料擺臂伺服至取框定點異常 | Load Swing Arm Servo Motor Take Position Error |
| 224 | 50249 | 重大 | 進料擺臂伺服至中定點異常 | Load Swing Arm Servo Motor Center Position Error |
| 225 | 50250 | 重大 | 進料擺臂伺服至放框定點異常 | Load Swing Arm Servo Motor Put Position Error |

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| 226 | 50251 | 重大 | 進料擺臂伺服回原點要求 | Load Swing Arm Servo Motor Origin Request |
| 227 | 50252 | 重大 | 進料擺臂伸縮氣缸-左伸定點異常 | （F252）Load Swing Arm Stretch Cylinder, Left Extend Position Error"}, |
| 228 | 50253 | 重大 | 進料擺臂伸縮氣缸-左縮定點異常 | （F253）Load Swing Arm Stretch Cylinder, Left Retract Position Error"}, |
| 229 | 50254 | 重大 | 進料擺臂伸縮氣缸-左檢知異常 | （F254）Load Swing Arm Stretch Cylinder, Left Sensor Error"}, |
| 230 | 50255 | 重大 | 進料擺臂伸縮氣缸-右伸定點異常 | （F255）Load Swing Arm Stretch Cylinder, Right Extend Position Error"}, |
| 231 | 50256 | 重大 | 進料擺臂伸縮氣缸-右縮定點異常 | （F256）Load Swing Arm Stretch Cylinder, Right Retract Position Error"}, |
| 232 | 50257 | 重大 | 進料擺臂伸縮氣缸-右檢知異常 | （F257）Load Swing Arm Stretch Cylinder, Right Sensor Error"}, |
| 233 | 50258 | 重大 | （F258） | （F258） |
| 234 | 50259 | 重大 | （F259） | （F259） |
| 235 | 50260 | 重大 | （F260） | （F260） |
| 236 | 50261 | 重大 | （F261） | （F261） |
| 237 | 50262 | 重大 | （F262） | （F262） |
| 238 | 50263 | 重大 | （F263） | （F263） |
| 239 | 50264 | 重大 | （F264） | （F264） |
| 240 | 50265 | 重大 | （F265） | （F265） |
| 241 | 50266 | 重大 | （F266） | （F266） |
| 242 | 50267 | 重大 | （F267） | （F267） |
| 243 | 50268 | 重大 | （F268） | （F268） |
| 244 | 50269 | 重大 | （F269） | （F269） |

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| 245 | 50270 | 重大 | （F270） | （F270） |
| 246 | 50271 | 重大 | （F271） | （F271） |
| 247 | 50272 | 重大 | 進料爐門變頻器 INV-B4 異常 | Load Oven Door Inverter- B6 Error |
| 248 | 50273 | 重大 | 進料爐門開極限異常 | Load Oven Door Open Limit Error |
| 249 | 50274 | 重大 | 進料爐門關極限異常 | Load Oven Door Close Limit Error |
| 250 | 50275 | 重大 | 進料爐門開關檢知異常 | Load Oven Door Open Close Sensor Error |
| 251 | 50276 | 重大 | 進料爐門未在定點異常 | Load Oven Door Not At Position Error |
| 252 | 50277 | 重大 | 進料爐門開門逾時異常 | Load Oven Door Open Over Time Error |
| 253 | 50278 | 重大 | 進料爐門關門逾時異常 | Load Oven Door Close Over Time Error |
| 254 | 50279 | 重大 | （F279） | （F279） |
| 255 | 50280 | 重大 | 爐體移載 1 伺服馬達異常 | Oven Transfer-1 Servo Motor Error |
| 256 | 50281 | 重大 | 爐體移載 1 伺服馬達前極限異常 | Oven Transfer-1 Servo Motor Front Limit Error |
| 257 | 50282 | 重大 | 爐體移載 1 伺服馬達後極限異常 | Oven Transfer-1 Servo Motor Rear Limit Error |
| 258 | 50283 | 重大 | 爐體移載 1 伺服原點復歸異常 | Oven Transfer-1 Servo Motor Origin Error |
| 259 | 50284 | 重大 | 爐體移載 1 伺服至前定點移動異常 | Oven Transfer-1 Servo Motor Front Position Error |
| 260 | 50285 | 重大 | 爐體移載 1 伺服至後定點移動異常 | Oven Transfer-1 Servo Motor Rear Position Error |
| 261 | 50286 | 重大 | 爐體移載 2 伺服馬達異常 | Oven Transfer-2 Servo Motor Error |
| 262 | 50287 | 重大 | 爐體移載 2 伺服馬達前極限異常 | Oven Transfer-2 Servo Motor Front Limit Error |
| 263 | 50288 | 重大 | 爐體移載 2 伺服馬達後極限異常 | Oven Transfer-2 Servo Motor Rear Limit Error |
| 264 | 50289 | 重大 | 爐體移載 2 伺服原點復歸異常 | Oven Transfer-2 Servo Motor Origin Error |

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| 265 | 50290 | 重大 | 爐體移載 2 伺服至前定點移動異常 | Oven Transfer-2 Servo Motor Front Position Error |
| 266 | 50291 | 重大 | 爐體移載 2 伺服至後定點移動異常 | Oven Transfer-2 Servo Motor Rear Position Error |
| 267 | 50292 | 重大 | 爐體移載 3 伺服馬達異常 | Oven Transfer-3 Servo Motor Error |
| 268 | 50293 | 重大 | 爐體移載 3 伺服馬達前極限異常 | Oven Transfer-3 Servo Motor Front Limit Error |
| 269 | 50294 | 重大 | 爐體移載 3 伺服馬達後極限異常 | Oven Transfer-3 Servo Motor Rear Limit Error |
| 270 | 50295 | 重大 | 爐體移載 3 伺服原點復歸異常 | Oven Transfer-3 Servo Motor Origin Error |
| 271 | 50296 | 重大 | 爐體移載 3 伺服至前定點移動異常 | Oven Transfer-3 Servo Motor Front Position Error |
| 272 | 50297 | 重大 | 爐體移載 3 伺服至後定點移動異常 | Oven Transfer-3 Servo Motor Rear Position Error |
| 273 | 50298 | 重大 | 爐體移載 4 伺服馬達異常 | Oven Transfer-4 Servo Motor Error |
| 274 | 50299 | 重大 | 爐體移載 4 伺服馬達前極限異常 | Oven Transfer-4 Servo Motor Front Limit Error |
| 275 | 50300 | 重大 | 爐體移載 4 伺服馬達後極限異常 | Oven Transfer-4 Servo Motor Rear Limit Error |
| 276 | 50301 | 重大 | 爐體移載 4 伺服原點復歸異常 | Oven Transfer-4 Servo Motor Origin Error |
| 277 | 50302 | 重大 | 爐體移載 4 伺服至前定點移動異常 | Oven Transfer-4 Servo Motor Front Position Error |
| 278 | 50303 | 重大 | 爐體移載 4 伺服至後定點移動異常 | Oven Transfer-4 Servo Motor Rear Position Error |
| 279 | 50304 | 重大 | 爐體移載 5 伺服馬達異常 | Oven Transfer-5 Servo Motor Error |
| 280 | 50305 | 重大 | 爐體移載 5 伺服馬達前極限異常 | Oven Transfer-5 Servo Motor Front Limit Error |
| 281 | 50306 | 重大 | 爐體移載 5 伺服馬達後極限異常 | Oven Transfer-5 Servo Motor Rear Limit Error |
| 282 | 50307 | 重大 | 爐體移載 5 伺服原點復歸異常 | Oven Transfer-5 Servo Motor Origin Error |
| 283 | 50308 | 重大 | 爐體移載 5 伺服至前定點移動異常 | Oven Transfer-5 Servo Motor Front Position Error |

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| 284 | 50309 | 重大 | 爐體移載 5 伺服至後定點移動異常 | Oven Transfer-5 Servo Motor Rear Position Error |
| 285 | 50310 | 重大 | 爐體移載連鎖<1-2>異常 | Oven Transfer Interlock<1- 2> Error |
| 286 | 50311 | 重大 | 爐體移載連鎖<2-3>異常 | Oven Transfer Interlock<2- 3> Error |
| 287 | 50312 | 重大 | 爐體移載連鎖<3-4>異常 | Oven Transfer Interlock<3- 4> Error |
| 288 | 50313 | 重大 | 爐體移載連鎖<4-5>異常 | Oven Transfer Interlock<4- 5> Error |
| 289 | 50314 | 重大 | （F314） | （F314） |
| 290 | 50315 | 重大 | （F315） | （F315） |
| 291 | 50316 | 重大 | 爐體昇降搬移 01 伺服馬達異常 | Oven Elevator 01 Servo Motor Error |
| 292 | 50317 | 重大 | 爐體昇降搬移 01 未在定點異常 | Oven Elevator 01 Not At Position Error |
| 293 | 50318 | 重大 | 爐體昇降搬移 01 上昇逾時異常 | Oven Elevator 01 Up Over Time Error |
| 294 | 50319 | 重大 | 爐體昇降搬移 01 下降逾時異常 | Oven Elevator 01 Down Over Time Error |
| 295 | 50320 | 重大 | 爐體昇降搬移 02 伺服馬達異常 | Oven Elevator 02 Servo Motor Error |
| 296 | 50321 | 重大 | 爐體昇降搬移 02 未在定點異常 | Oven Elevator 02 Not At Position Error |
| 297 | 50322 | 重大 | 爐體昇降搬移 02 上昇逾時異常 | Oven Elevator 02 Up Over Time Error |
| 298 | 50323 | 重大 | 爐體昇降搬移 02 下降逾時異常 | Oven Elevator 02 Down Over Time Error |
| 299 | 50324 | 重大 | 爐體昇降搬移 03 伺服馬達異常 | Oven Elevator 03 Servo Motor Error |
| 300 | 50325 | 重大 | 爐體昇降搬移 03 未在定點異常 | Oven Elevator 03 Not At Position Error |
| 301 | 50326 | 重大 | 爐體昇降搬移 03 上昇逾時異常 | Oven Elevator 03 Up Over Time Error |
| 302 | 50327 | 重大 | 爐體昇降搬移 03 下降逾時異常 | Oven Elevator 03 Down Over Time Error |
| 303 | 50328 | 重大 | 爐體昇降搬移 04 伺服馬達異常 | Oven Elevator 04 Servo |

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|  |  |  |  | Motor Error |
| 304 | 50329 | 重大 | 爐體昇降搬移 04 未在定點異常 | Oven Elevator 04 Not At Position Error |
| 305 | 50330 | 重大 | 爐體昇降搬移 04 上昇逾時異常 | Oven Elevator 04 Up Over Time Error |
| 306 | 50331 | 重大 | 爐體昇降搬移 04 下降逾時異常 | Oven Elevator 04 Down Over Time Error |
| 307 | 50332 | 重大 | 爐體昇降搬移 05 伺服馬達異常 | Oven Elevator 05 Servo Motor Error |
| 308 | 50333 | 重大 | 爐體昇降搬移 05 未在定點異常 | Oven Elevator 05 Not At Position Error |
| 309 | 50334 | 重大 | 爐體昇降搬移 05 上昇逾時異常 | Oven Elevator 05 Up Over Time Error |
| 310 | 50335 | 重大 | 爐體昇降搬移 05 下降逾時異常 | Oven Elevator 05 Down Over Time Error |
| 311 | 50336 | 重大 | 爐體昇降搬移 06 伺服馬達異常 | Oven Elevator 06 Servo Motor Error |
| 312 | 50337 | 重大 | 爐體昇降搬移 06 未在定點異常 | Oven Elevator 06 Not At Position Error |
| 313 | 50338 | 重大 | 爐體昇降搬移 06 上昇逾時異常 | Oven Elevator 06 Up Over Time Error |
| 314 | 50339 | 重大 | 爐體昇降搬移 06 下降逾時異常 | Oven Elevator 06 Down Over Time Error |
| 315 | 50340 | 重大 | 爐體昇降搬移 07 伺服馬達異常 | Oven Elevator 07 Servo Motor Error |
| 316 | 50341 | 重大 | 爐體昇降搬移 07 未在定點異常 | Oven Elevator 07 Not At Position Error |
| 317 | 50342 | 重大 | 爐體昇降搬移 07 上昇逾時異常 | Oven Elevator 07 Up Over Time Error |
| 318 | 50343 | 重大 | 爐體昇降搬移 07 下降逾時異常 | Oven Elevator 07 Down Over Time Error |
| 319 | 50344 | 重大 | 出料爐門變頻器異常 INV-B5"}, | Unload Oven Door Inverter Error INV-B5 |
| 320 | 50345 | 重大 | 出料爐門開極限異常"}, | Unload Oven Door Open Limit Error |
| 321 | 50346 | 重大 | 出料爐門關極限異常"}, | Unload Oven Door Close Limit Error |
| 322 | 50347 | 重大 | 出料爐門開關檢知異常"}, | Unload Oven Door Open Close Sensor Error |

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| 323 | 50348 | 重大 | 出料爐門未在定點異常"}, | Unload Oven Door Not At Position Error |
| 324 | 50349 | 重大 | 出料爐門開門逾時異常"}, | Unload Oven Door Open Over Time Error |
| 325 | 50350 | 重大 | 出料爐門關門逾時異常"}, | Unload Oven Door Close Over Time Error |
| 326 | 50351 | 重大 | （F351） | （F351） |
| 327 | 50352 | 重大 | 第 1 槽 電熱低溫警報 | No.1 Heater Temperature Low Error |
| 328 | 50353 | 重大 | 第 2 槽 電熱低溫警報 | No.2 Heater Temperature Low Error |
| 329 | 50354 | 重大 | 第 3 槽 電熱低溫警報 | No.3 Heater Temperature Low Error |
| 330 | 50355 | 重大 | 第 4 槽 電熱低溫警報 | No.4 Heater Temperature Low Error |
| 331 | 50356 | 重大 | 第 5 槽 電熱低溫警報 | No.5 Heater Temperature Low Error |
| 332 | 50357 | 重大 | 第 6 槽 電熱低溫警報 | No.6 Heater Temperature Low Error |
| 333 | 50384 | 重大 | 第 1 槽 電熱超溫警報 | No.1 Heater Temperature High Error |
| 334 | 50385 | 重大 | 第 2 槽 電熱超溫警報 | No.2 Heater Temperature High Error |
| 335 | 50386 | 重大 | 第 3 槽 電熱超溫警報 | No.3 Heater Temperature High Error |
| 336 | 50387 | 重大 | 第 4 槽 電熱超溫警報 | No.4 Heater Temperature High Error |
| 337 | 50388 | 重大 | 第 5 槽 電熱超溫警報 | No.5 Heater Temperature High Error |
| 338 | 50389 | 重大 | 第 6 槽 電熱超溫警報 | No.6 Heater Temperature High Error |
| 339 | 50416 | 重大 | 第 1 槽 電熱電流異常警報 | No.1 Heater Current Error |
| 340 | 50417 | 重大 | 第 2 槽 電熱電流異常警報 | No.2 Heater Current Error |
| 341 | 50418 | 重大 | 第 3 槽 電熱電流異常警報 | No.3 Heater Current Error |
| 342 | 50419 | 重大 | 第 4 槽 電熱電流異常警報 | No.4 Heater Current Error |

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| 343 | 50420 | 重大 | 第 5 槽 電熱電流異常警報 | No.5 Heater Current Error |
| 344 | 50421 | 重大 | 第 6 槽 電熱電流異常警報 | No.6 Heater Current Error |
| 345 | 50448 | 重大 | 第 1 槽 進氣風車過載 | No.1 Intake Blower Overload Error |
| 346 | 50449 | 重大 | 第 2 槽 進氣風車過載 | No.2 Intake Blower Overload Error |
| 347 | 50450 | 重大 | 第 3 槽 進氣風車過載 | No.3 Intake Blower Overload Error |
| 348 | 50451 | 重大 | 第 4 槽 進氣風車過載 | No.4 Intake Blower Overload Error |
| 349 | 50452 | 重大 | 第 5 槽 進氣風車過載 | No.5 Intake Blower Overload Error |
| 350 | 50453 | 重大 | 第 6 槽 進氣風車過載 | No.6 Intake Blower Overload Error |
| 351 | 50480 | 重大 | 第 1 槽 循環風車過載 | No.1 Cycle Blower Overload Error |
| 352 | 50455 | 重大 | 第 2 槽 循環風車過載 | No.2 Cycle Blower Overload Error |
| 353 | 50456 | 重大 | 第 3 槽 循環風車過載 | No.3 Cycle Blower Overload Error |
| 354 | 50457 | 重大 | 第 4 槽 循環風車過載 | No.4 Cycle Blower Overload Error |
| 355 | 50458 | 重大 | 第 5 槽 循環風車過載 | No.5 Cycle Blower Overload Error |
| 356 | 50459 | 重大 | 第 6 槽 循環風車過載 | No.6 Cycle Blower Overload Error |
| 357 | 50512 | 重大 | 進料保溫段風車 INV-10 異常 | Load Constant Temperature Blower Inerter-10 Error |
| 358 | 50513 | 重大 | 出料保溫段風車 INV-11 異常 | Unload Constant Temperature Blower Inerter-11 Error |
| 359 | 50514 | 重大 | 出料冷卻段風車 INV-12 異常 | Unload Cooling Blower Inerter-12 Error |
| 360 | 50515 | 重大 | （F515） | （F515） |
| 361 | 50516 | 重大 | （F516） | （F516） |
| 362 | 50517 | 重大 | （F517） | （F517） |

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| 363 | 50518 | 重大 | （F518） | （F518） |
| 364 | 50519 | 重大 | （F519） | （F519） |
| 365 | 50520 | 重大 | 出料手臂移載伺服馬達異常 | Unload Arm Transfer Servo Motor Error |
| 366 | 50521 | 重大 | 出料手臂移載伺服馬達前極限異常 | Unload Arm Transfer Servo Motor Front Limit Error |
| 367 | 50522 | 重大 | 出料手臂移載伺服馬達後極限異常 | Unload Arm Transfer Servo Motor Rear Limit Error |
| 368 | 50523 | 重大 | 出料手臂移載伺服馬達原點復歸異常 | Unload Arm Transfer Servo Motor Origin Error |
| 369 | 50524 | 重大 | 出料手臂移載伺服至夾框定點異常 | Unload Arm Transfer Servo Motor Take Position Error |
| 370 | 50525 | 重大 | 出料手臂移載伺服至中定點異常 | Unload Arm Transfer Servo Motor Center Position Error |
| 371 | 50526 | 重大 | 出料手臂移載伺服至放框定點異常 | Unload Arm Transfer Servo Motor Put Position Error |
| 372 | 50527 | 重大 | 出料手臂昇降伺服馬達異常 | Unload Arm Elevator Servo Motor Error |
| 373 | 50528 | 重大 | 出料手臂昇降伺服馬達上極限異常 | Unload Arm Elevator Servo Motor Up Limit Error |
| 374 | 50529 | 重大 | 出料手臂昇降伺服馬達下極限異常 | Unload Arm Elevator Servo Motor Down Limit Error |
| 375 | 50530 | 重大 | 出料手臂昇降伺服馬達原點復歸異常 | Unload Arm Elevator Servo Motor Origin Error |
| 376 | 50531 | 重大 | 出料手臂昇降伺服至移載定點異常 | Unload Arm Elevator Servo Motor Transfer Position Error |
| 377 | 50532 | 重大 | 出料手臂昇降伺服至夾框上定點異常 | Unload Arm Elevator Servo Motor Take Up Position Error |
| 378 | 50533 | 重大 | 出料手臂昇降伺服至夾框定點異常 | Unload Arm Elevator Servo Motor Take Position Error |
| 379 | 50534 | 重大 | 出料手臂昇降伺服至放框定點異常 | Unload Arm Elevator Servo Motor Put Position Error |
| 380 | 50535 | 重大 | 出料手臂旋轉伺服馬達異常 | Unload Arm Rotation Servo Motor Error |
| 381 | 50536 | 重大 | 出料手臂旋轉伺服馬達前極限異常 | Unload Arm Rotation Servo |

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|  |  |  |  | Motor Front Limit Error |
| 382 | 50537 | 重大 | 出料手臂旋轉伺服馬達後極限異常 | Unload Arm Rotation Servo Motor Rear Limit Error |
| 383 | 50538 | 重大 | 出料手臂旋轉伺服馬達原點復歸異常 | Unload Arm Rotation Servo Motor Origin Error |
| 384 | 50539 | 重大 | 出料手臂旋轉伺服至垂直定點異常 | Unload Arm Rotation Servo Motor Vertical Position Error |
| 385 | 50540 | 重大 | 出料手臂旋轉伺服至水平定點異常 | Unload Arm Rotation Servo Motor Horizontal Position Error |
| 386 | 50541 | 重大 | 出料手臂-夾框氣缸夾定點異常 | Unload Arm Clip Frame Cylinder Close Position Error |
| 387 | 50542 | 重大 | 出料手臂-夾框氣缸開定點異常 | Unload Arm Clip Frame Cylinder Open Position Error |
| 388 | 50543 | 重大 | 出料手臂-夾框氣缸檢知異常 | Unload Arm Clip Frame Cylinder Sensor Error |
| 389 | 50544 | 重大 | （F544） | （F544） |
| 390 | 50545 | 重大 | （F545） | （F545） |
| 391 | 50546 | 重大 | （F546） | （F546） |
| 392 | 50547 | 重大 | （F547） | （F547） |
| 393 | 50548 | 重大 | （F548） | （F548） |
| 394 | 50549 | 重大 | （F549） | （F549） |
| 395 | 50550 | 重大 | （F550） | （F550） |
| 396 | 50551 | 重大 | （F551） | （F551） |
| 397 | 50552 | 重大 | 出料固定框伸出-左前伸定點異常 | Unload Fixed Frame-Left Front Stretch Cylinder Extend Position Error |
| 398 | 50553 | 重大 | 出料固定框伸出-左前縮定點異常 | Unload Fixed Frame-Left Front Stretch Cylinder Retract Position Error |
| 399 | 50554 | 重大 | 出料固定框伸出-左前檢知異常 | Unload Fixed Frame-Left Front Stretch Cylinder Sensor Error |

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| 400 | 50555 | 重大 | 出料固定框伸出-左後伸定點異常 | Unload Fixed Frame-Left Rear Stretch Cylinder Extend Position Error |
| 401 | 50556 | 重大 | 出料固定框伸出-左後縮定點異常 | Unload Fixed Frame-Left Rear Stretch Cylinder Retract Position Error |
| 402 | 50557 | 重大 | 出料固定框伸出-左後檢知異常 | Unload Fixed Frame-Left Rear Stretch Cylinder Sensor Error |
| 403 | 50558 | 重大 | 出料固定框伸出-右前伸定點異常 | Unload Fixed Frame-Right Front Stretch Cylinder Extend Position Error |
| 404 | 50559 | 重大 | 出料固定框伸出-右前縮定點異常 | Unload Fixed Frame-Right Front Stretch Cylinder Retract Position Error |
| 405 | 50560 | 重大 | 出料固定框伸出-右前檢知異常 | Unload Fixed Frame-Right Front Stretch Cylinder Sensor Error |
| 406 | 50561 | 重大 | 出料固定框伸出-右後伸定點異常 | Unload Fixed Frame-Right Rear Stretch Cylinder Extend Position Error |
| 407 | 50562 | 重大 | 出料固定框伸出-右後縮定點異常 | Unload Fixed Frame-Right Rear Stretch Cylinder Retract Position Error |
| 408 | 50563 | 重大 | 出料固定框伸出-右後檢知異常 | Unload Fixed Frame-Right Rear Stretch Cylinder Sensor Error |
| 409 | 50564 | 重大 | 出料固定框架夾爪氣缸-左前夾定點異常 | Unload Fixed Frame Claw Cylinder-Left Front Close Position Error |
| 410 | 50565 | 重大 | 出料固定框架夾爪氣缸-左前開定點異常 | Unload Fixed Frame Claw Cylinder-Left Front Open Position Error |
| 411 | 50566 | 重大 | 出料固定框架夾爪氣缸-左前檢知異常 | Unload Fixed Frame Claw Cylinder-Left Front Sensor Error |
| 412 | 50567 | 重大 | 出料固定框架夾爪氣缸-左後夾定點異常 | Unload Fixed Frame Claw Cylinder-Left Rear Close Position Error |
| 413 | 50568 | 重大 | 出料固定框架夾爪氣缸-左後開定點異常 | Unload Fixed Frame Claw Cylinder-Left Rear Open Position Error |

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| 414 | 50569 | 重大 | 出料固定框架夾爪氣缸-左後檢知異常 | Unload Fixed Frame Claw Cylinder-Left Rear Sensor Error |
| 415 | 50570 | 重大 | 出料固定框架夾爪氣缸-右前夾定點異常 | Unload Fixed Frame Claw Cylinder-Right Front Close Position Error |
| 416 | 50571 | 重大 | 出料固定框架夾爪氣缸-右前開定點異常 | Unload Fixed Frame Claw Cylinder-Right Front Open Position Error |
| 417 | 50572 | 重大 | 出料固定框架夾爪氣缸-右前檢知異常 | Unload Fixed Frame Claw Cylinder-Right Front Sensor Error |
| 418 | 50573 | 重大 | 出料固定框架夾爪氣缸-右後夾定點異常 | Unload Fixed Frame Claw Cylinder-Right Rear Close Position Error |
| 419 | 50574 | 重大 | 出料固定框架夾爪氣缸-右後開定點異常 | Unload Fixed Frame Claw Cylinder-Right Rear Open Position Error |
| 420 | 50575 | 重大 | 出料固定框架夾爪氣缸-右後檢知異常 | Unload Fixed Frame Claw Cylinder-Right Rear Sensor Error |
| 421 | 50576 | 重大 | 出料開框機構左伸出定點異常 | Unload Open Frame Machine Left Stretch Cylinder Extend Position Error |
| 422 | 50577 | 重大 | 出料開框機構左縮回定點異常 | Unload Open Frame Machine Left Stretch Cylinder Retract Position Error |
| 423 | 50578 | 重大 | 出料開框機構左伸縮檢知異常 | Unload Open Frame Machine Left Stretch Cylinder Sensor Error |
| 424 | 50579 | 重大 | 出料開框機構右伸出定點異常 | Unload Open Frame Machine Right Stretch Cylinder Extend Position Error |
| 425 | 50580 | 重大 | 出料開框機構右縮回定點異常 | Unload Open Frame Machine Right Stretch Cylinder Retract Position Error |
| 426 | 50581 | 重大 | 出料開框機構右伸縮檢知異常 | Unload Open Frame Machine Right Stretch Cylinder Sensor Error |

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| 427 | 50582 | 重大 | 出料開框機構左上昇定點異常 | Unload Open Frame Machine Left Elevator Cylinder Up Position Error |
| 428 | 50583 | 重大 | 出料開框機構左下降定點異常 | Unload Open Frame Machine Left Elevator Cylinder Down Position Error |
| 429 | 50584 | 重大 | 出料開框機構左昇降檢知異常 | Unload Open Frame Machine Left Elevator Cylinder Sensor Error |
| 430 | 50585 | 重大 | 出料開框機構右上昇定點異常 | Unload Open Frame Machine Right Elevator Cylinder Up Position Error |
| 431 | 50586 | 重大 | 出料開框機構右下降定點異常 | Unload Open Frame Machine Right Elevator Cylinder Down Position Error |
| 432 | 50587 | 重大 | 出料開框機構右昇降檢知異常 | Unload Open Frame Machine Right Elevator Cylinder Sensor Error |
| 433 | 50588 | 重大 | 出料開框機構開夾-左開定點異常 | Unload Open Frame Machine Open Claw Cylinder Left Open Position Error |
| 434 | 50589 | 重大 | 出料開框機構開夾-左夾定點異常 | Unload Open Frame Machine Open Claw Cylinder Left Close Position Error |
| 435 | 50590 | 重大 | 出料開框機構開夾-左檢知異常 | Unload Open Frame Machine Open Claw Cylinder Left Sensor Error |
| 436 | 50591 | 重大 | 出料開框機構開夾-右開定點異常 | Unload Open Frame Machine Open Claw Cylinder Right Open Position Error |
| 437 | 50592 | 重大 | 出料開框機構開夾-右夾定點異常 | Unload Open Frame Machine Open Claw Cylinder Right Close Position Error |
| 438 | 50593 | 重大 | 出料開框機構開夾-右檢知異常 | Unload Open Frame Machine Open Claw Cylinder Right Sensor Error |
| 439 | 50594 | 重大 | （F594） | （F594） |

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| 440 | 50595 | 重大 | （F595） | （F595） |
| 441 | 50596 | 重大 | （F596） | （F596） |
| 442 | 50597 | 重大 | （F597） | （F597） |
| 443 | 50598 | 重大 | （F598） | （F598） |
| 444 | 50599 | 重大 | （F599） | （F599） |
| 445 | 50600 | 重大 | （F600） | （F600） |
| 446 | 50601 | 重大 | （F601） | （F601） |
| 447 | 50602 | 重大 | （F602） | （F602） |
| 448 | 50603 | 重大 | （F603） | （F603） |
| 449 | 50604 | 重大 | （F604） | （F604） |
| 450 | 50605 | 重大 | （F605） | （F605） |
| 451 | 50606 | 重大 | （F606） | （F606） |
| 452 | 50607 | 重大 | （F607） | （F607） |
| 453 | 50608 | 重大 | （F608） | （F608） |
| 454 | 50609 | 重大 | （F609） | （F609） |
| 455 | 50610 | 重大 | （F610） | （F610） |
| 456 | 50611 | 重大 | （F611） | （F611） |
| 457 | 50612 | 重大 | （F612） | （F612） |
| 458 | 50613 | 重大 | （F613） | （F613） |
| 459 | 50614 | 重大 | （F614） | （F614） |
| 460 | 50615 | 重大 | （F615） | （F615） |
| 461 | 50616 | 重大 | 出料托框昇降變頻器 INV-C2 異常 | Load Mount Frame Elevator Inveter-C2 Error |
| 462 | 50617 | 重大 | 出料-托框昇降上極限異常 | Load Mount Frame Elevator Up Limit Error |

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| 463 | 50618 | 重大 | 出料-托框昇降下極限異常 | Load Mount Frame Elevator Down Limit Error |
| 464 | 50619 | 重大 | 出料-托框昇降上下檢知異常 | Load Mount Frame Elevator Up Down Sensor Error |
| 465 | 50620 | 重大 | 出料-托框昇降未在定點異常 | Load Mount Frame Elevator Not At Position Error |
| 466 | 50621 | 重大 | 出料-托框昇降上昇逾時異常 | Load Mount Frame Elevator Up Over Time Error |
| 467 | 50622 | 重大 | 出料-托框昇降下降逾時異常 | Load Mount Frame Elevator Down Over Time Error |
| 468 | 50623 | 重大 | （F623） | （F623） |
| 469 | 50624 | 重大 | （F624） | （F624） |
| 470 | 50625 | 重大 | （F625） | （F625） |
| 471 | 50626 | 重大 | （F626） | （F626） |
| 472 | 50627 | 重大 | （F627） | （F627） |
| 473 | 50628 | 重大 | （F628） | （F628） |
| 474 | 50629 | 重大 | （F629） | （F629） |
| 475 | 50630 | 重大 | （F630） | （F630） |
| 476 | 50631 | 重大 | （F631） | （F631） |
| 477 | 50632 | 重大 | 框架回流輸送 1 變頻器INV-B1 異常 | Frame Reflow Conveyor1 Inverter-B1 Error |
| 478 | 50633 | 重大 | 框架回流輸送 2 變頻器INV-B2 異常 | Frame Reflow Conveyor2 Inverter-B2 Error |
| 479 | 50634 | 重大 | 框架回流輸送 3 變頻器INV-B3 異常 | Frame Reflow Conveyor3 Inverter-B3 Error |
| 480 | 50635 | 重大 | 框架回流輸送 4 變頻器INV-B4 異常 | Frame Reflow Conveyor4 Inverter-B4 Error |
| 481 | 50636 | 重大 | （F636） | （F636） |
| 482 | 50637 | 重大 | （F637） | （F637） |
| 483 | 50638 | 重大 | （F638） | （F638） |

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| 484 | 50639 | 重大 | （F639） | （F639） |
| 485 | 50640 | 重大 | 回流檔框 1 氣缸上昇定點異常 | Frame Reflow Block-1 Cylinder Up Position Error |
| 486 | 50641 | 重大 | 回流檔框 1 氣缸下降定點異常 | Frame Reflow Block-1 Cylinder Down Position Error |
| 487 | 50642 | 重大 | 回流檔框 1 氣缸昇降檢知異常 | Frame Reflow Block-1 Cylinder Up Down Sensor Error |
| 488 | 50643 | 重大 | 回流檔框 2 氣缸上昇定點異常 | Frame Reflow Block-2 Cylinder Up Position Error |
| 489 | 50644 | 重大 | 回流檔框 2 氣缸下降定點異常 | Frame Reflow Block-2 Cylinder Down Position Error |
| 490 | 50645 | 重大 | 回流檔框 2 氣缸昇降檢知異常 | Frame Reflow Block-2 Cylinder Up Down Sensor Error |
| 491 | 50646 | 重大 | （F646） | （F646） |
| 492 | 50647 | 重大 | （F647） | （F647） |
| 493 | 50648 | 重大 | 出料平台移載伺服馬達異常 | Unload Plateform Transfer Servo Motor Error |
| 494 | 50649 | 重大 | 出料平台移載伺服馬達前極限異常 | Unload Plateform Transfer Servo Motor Front Limit Error |
| 495 | 50650 | 重大 | 出料平台移載伺服馬達後極限異常 | Unload Plateform Transfer Servo Motor Rear Limit Error |
| 496 | 50651 | 重大 | 出料平台移載伺服馬達原點復歸異常 | Unload Plateform Transfer Servo Motor Origin Error |
| 497 | 50652 | 重大 | 出料平台移載伺服至進料定點異常 | Unload Plateform Transfer Servo Motor Load Position Error |
| 498 | 50653 | 重大 | 出料平台移載伺服至出料定點異常 | Unload Plateform Transfer Servo Motor Unload Position Error |
| 499 | 50654 | 重大 | 出料平台昇降伺服馬達異常 | Unload Plateform Elevator Servo Motor Error |
| 500 | 50655 | 重大 | 出料平台昇降伺服馬達前極限異常 | Unload Plateform Elevator Servo Motor Front Limit |

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| 501 | 50656 | 重大 | 出料平台昇降伺服馬達後極限異常 | Unload Plateform Elevator Servo Motor Rear Limit Error |
| 502 | 50657 | 重大 | 出料平台昇降伺服馬達原點復歸異常 | Unload Plateform Elevator Servo Motor Origin Error |
| 503 | 50658 | 重大 | 出料平台昇降伺服至取板定點異常 | Unload Plateform Elevator Servo Motor Take Position Error |
| 504 | 50659 | 重大 | 出料平台昇降伺服至移載定點異常 | Unload Plateform Elevator Servo Motor Transfer Position Error |
| 505 | 50660 | 重大 | 出料平台昇降伺服至放板定點異常 | Unload Plateform Elevator Servo Motor Put Position Error |
| 506 | 50661 | 重大 | 出料平台拍板-前左拍定點異常 | Unload Plateform Pat Plate- Front Left Pat Position Error |
| 507 | 50662 | 重大 | 出料平台拍板-前左開定點異常 | Unload Plateform Pat Plate- Front Left Open Position Error |
| 508 | 50663 | 重大 | 出料平台拍板-前左檢知異常 | Unload Plateform Pat Plate- Front Left Sensor Error |
| 509 | 50664 | 重大 | 出料平台拍板-前右拍定點異常 | Unload Plateform Pat Plate- Front Right Pat Position Error |
| 510 | 50665 | 重大 | 出料平台拍板-前右開定點異常 | Unload Plateform Pat Plate- Front Right Open Position Error |
| 511 | 50666 | 重大 | 出料平台拍板-前右檢知異常 | Unload Plateform Pat Plate- Front Right Sensor Error |
| 512 | 50667 | 重大 | 出料平台拍板-後左拍定點異常 | Unload Plateform Pat Plate- Rear Left Pat Position Error |
| 513 | 50668 | 重大 | 出料平台拍板-後左開定點異常 | Unload Plateform Pat Plate- Rear Left Open Sensor Error |
| 514 | 50669 | 重大 | 出料平台拍板-後左檢知異常 | Unload Plateform Pat Plate- Rear Left Sensor Error |
| 515 | 50670 | 重大 | 出料平台拍板-後右拍定點異常 | Unload Plateform Pat Plate- Rear Right Pat Position Error |

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| 516 | 50671 | 重大 | 出料平台拍板-後右開定點異常 | Unload Plateform Pat Plate- Rear Right Open Sensor Error |
| 517 | 50672 | 重大 | 出料平台拍板-後右檢知異常 | Unload Plateform Pat Plate- Rear Right Sensor Error |
| 518 | 50673 | 重大 | 出料平台前左夾-夾定點異常 | Unload Plateform Front Left Claw Close Position Error |
| 519 | 50674 | 重大 | 出料平台前左夾-開定點異常 | Unload Plateform Front Left Claw Open Position Error |
| 520 | 50675 | 重大 | 出料平台前左夾-檢知異常 | Unload Plateform Front Left Claw Sensor Error |
| 521 | 50676 | 重大 | 出料平台前右夾-夾定點異常 | Unload Plateform Front Right Claw Close Position Error |
| 522 | 50677 | 重大 | 出料平台前右夾-開定點異常 | Unload Plateform Front Right Claw Open Position Error |
| 523 | 50678 | 重大 | 出料平台前右夾-檢知異常 | Unload Plateform Front Right Claw Sensor Error |
| 524 | 50679 | 重大 | 出料平台後左夾-夾定點異常 | Unload Plateform Rear Left Claw Close Position Error |
| 525 | 50680 | 重大 | 出料平台後左夾-開定點異常 | Unload Plateform Rear Left Claw Open Position Error |
| 526 | 50681 | 重大 | 出料平台後左夾-檢知異常 | Unload Plateform Rear Left Claw Sensor Error |
| 527 | 50682 | 重大 | 出料平台後右夾-夾定點異常 | Unload Plateform Rear Right Claw Close Position Error |
| 528 | 50683 | 重大 | 出料平台後右夾-開定點異常 | Unload Plateform Rear Right Claw Open Position Error |
| 529 | 50684 | 重大 | 出料平台後右夾-檢知異常 | Unload Plateform Rear Right Claw Sensor Error |
| 530 | 50685 | 重大 | （F685） | （F685） |
| 531 | 50686 | 重大 | （F686） | （F686） |
| 532 | 50687 | 重大 | （F687） | （F687） |
| 533 | 50688 | 重大 | （F688） | （F688） |

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| 534 | 50689 | 重大 | （F689） | （F689） |
| 535 | 50690 | 重大 | （F690） | （F690） |
| 536 | 50691 | 重大 | （F691） | （F691） |
| 537 | 50692 | 重大 | （F692） | （F692） |
| 538 | 50693 | 重大 | （F693） | （F693） |
| 539 | 50694 | 重大 | （F694） | （F694） |
| 540 | 50695 | 重大 | （F695） | （F695） |
| 541 | 50696 | 重大 | 出料皮帶輸送變頻器 INV-C1 異常 | Unload Conveyor Inveter- C1 Error |
| 542 | 50697 | 重大 | 出料輸送拍板氣缸左開定點異常 | Unload Conveyor Pat Plate Cylinder Left Open Position Error |
| 543 | 50698 | 重大 | 出料輸送拍板氣缸左拍定點異常 | Unload Conveyor Pat Plate Cylinder Left Pat Position Error |
| 544 | 50699 | 重大 | 出料輸送拍板氣缸左檢知異常 | Unload Conveyor Pat Plate Cylinder Left Sensor Error |
| 545 | 50700 | 重大 | 出料輸送拍板氣缸右開定點異常 | Unload Conveyor Pat Plate Cylinder Right Open Position Error |
| 546 | 50701 | 重大 | 出料輸送拍板氣缸右拍定點異常 | Unload Conveyor Pat Plate Cylinder Right Pat Position Error |
| 547 | 50702 | 重大 | 出料輸送拍板氣缸右檢知異常 | Unload Conveyor Pat Plate Cylinder Right Sensor Error |
| 548 | 50703 | 重大 | （F703） | （F703） |
| 549 | 50704 | 重大 | （F704） | （F704） |
| 550 | 50705 | 重大 | （F705） | （F705） |
| 551 | 50706 | 重大 | （F706） | （F706） |
| 552 | 50707 | 重大 | （F707） | （F707） |
| 553 | 50708 | 重大 | （F708） | （F708） |

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| 554 | 50709 | 重大 | （F709） | （F709） |
| 555 | 50710 | 重大 | （F710） | （F710） |
| 556 | 50711 | 重大 | （F711） | （F711） |
| 557 | 50712 | 重大 | PLC 電池低下 | PLC Battery Low |
| 558 | 50713 | 重大 | 安全門復歸要求 | Safety Door Reset Confirm |
| 559 | 50714 | 重大 | 進料操作側安全門開啟警示 | Load Operation Side, Safety Door Open Warning |
| 560 | 50715 | 重大 | 進料維修側安全門 1 開啟警示 | Load Maintenance Side, Safety Door-1 Open Warning |
| 561 | 50716 | 重大 | 進料維修側安全門 2 開啟警示 | Load Maintenance Side, Safety Door-2 Open Warning |
| 562 | 50717 | 重大 | （F717） | （F717） |
| 563 | 50718 | 重大 | 未達原點無法啟動 | Not Yet Origin Can't Start |
| 564 | 50719 | 重大 | 夾框爐參數不符 | Oven Parameter Does Not Match |
| 565 | 50720 | 重大 | （F720） | （F720） |
| 566 | 50721 | 重大 | （F721） | （F721） |
| 567 | 50722 | 重大 | 出料操作側安全門開啟警示 | Unload Operation Side, Safety Door Open Warning |
| 568 | 50723 | 重大 | 出料維修側安全門 1 開啟警示 | Unload Maintenance Side, Safety Door-1 Open Warning |
| 569 | 50724 | 重大 | 出料維修側安全門 2 開啟警示 | Unload Maintenance Side, Safety Door-2 Open Warning |
| 570 | 50725 | 重大 | 進料連線異常 | Load Interlock Error |
| 571 | 50726 | 重大 | 出料連線異常 | Unload Interlock Error |
| 572 | 50727 | 重大 | （F727） | （F727） |
| 573 | 50728 | 重大 | 進料平台整板伺服警告 | Load Plateform Alignment Servo Warning |

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| 574 | 50729 | 重大 | 進料輸送卡板異常 | Load Conveyor Stuck Plate Error |
| 575 | 50730 | 重大 | 進料輸送入口有板偵測異常 | There Is A Plate Error At The Conveyor Entrance |
| 576 | 50731 | 重大 | 進料平台整板原點位址變更，關機重啟需求 | Load Plateform Alignment Change Of Origin Address, Shutdown And Restart Requirements |
| 577 | 50732 | 重大 | 進料平台整板異常 | Load Plateform Alignment Error |
| 578 | 50733 | 重大 | （F733） | （F733） |
| 579 | 50734 | 重大 | （F734） | （F734） |
| 580 | 50735 | 重大 | （F735） | （F735） |
| 581 | 50736 | 重大 | 進料手臂移載伺服警告 | Load Arm Transfer Servo Warning |
| 582 | 50737 | 重大 | 進料手臂昇降伺服警告 | Load Arm Elevator Servo Warning |
| 583 | 50738 | 重大 | 進料手臂旋轉伺服警告 | Load Arm Rotation Servo Warning |
| 584 | 50739 | 重大 | 進料手臂夾爪伸縮伺服警告 | Load Arm Claw Stretch Servo Warning |
| 585 | 50740 | 重大 | 進料手臂夾板異常 | Load Arm Claw Close (Plate Sensor) Erro |
| 586 | 50741 | 重大 | 進料手臂夾爪伸縮原點位址變更，關機重啟需求 | Load Arm Claw Stretch Change Of Origin Address, Shutdown And Restart Requirements |
| 587 | 50742 | 重大 | （F742） | （F742） |
| 588 | 50743 | 重大 | （F743） | （F743） |
| 589 | 50744 | 重大 | 進料托框昇降伺服警告 | Load Mount Frame Elevator Servo Warning |
| 590 | 50745 | 重大 | 進料托框伸縮左有框偵測異常 | Load Mount Frame Stretch, Left Frame Sensor Error |
| 591 | 50746 | 重大 | 進料托框伸縮右有框偵測異常 | Load Mount Frame Stretch, Right Frame Sensor Error |
| 592 | 50747 | 重大 | （F747） | （F747） |

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| 593 | 50748 | 重大 | 進料開框機構框架偵測異常 | Load Open Frame Machine, Frame Sensor Error |
| 594 | 50749 | 重大 | 進料開框機構有框異常 | Load Open Frame Machine, Frame Sensor Something Error |
| 595 | 50750 | 重大 | 進料開框機構無框異常 | Load Open Frame Machine, Frame Sensor Empty Error |
| 596 | 50751 | 重大 | （F751） | （F751） |
| 597 | 50752 | 重大 | （F752） | （F752） |
| 598 | 50753 | 重大 | （F753） | （F753） |
| 599 | 50754 | 重大 | （F754） | （F754） |
| 600 | 50755 | 重大 | （F755） | （F755） |
| 601 | 50756 | 重大 | （F756） | （F756） |
| 602 | 50757 | 重大 | （F757） | （F757） |
| 603 | 50758 | 重大 | （F758） | （F758） |
| 604 | 50759 | 重大 | （F759） | （F759） |
| 605 | 50760 | 重大 | 進料擺臂伺服警告 | Load Swing Arm Servo Warning |
| 606 | 50761 | 重大 | 進料擺臂伺服至取框定點異常  <X344> | Load Swing Arm Servo Motor Take Position Error<X344> |
| 607 | 50762 | 重大 | 進料擺臂伺服至中定點異常  <X345> | Load Swing Arm Servo Motor Center Position Error<X345> |
| 608 | 50763 | 重大 | 進料擺臂伺服至放框定點異常  <X346> | Load Swing Arm Servo Motor Put Position Error<X346> |
| 609 | 50764 | 重大 | （F764） | （F764） |
| 610 | 50765 | 重大 | （F765） | （F765） |
| 611 | 50766 | 重大 | （F766） | （F766） |
| 612 | 50767 | 重大 | （F767） | （F767） |

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| 613 | 50768 | 重大 | （F768） | （F768） |
| 614 | 50769 | 重大 | （F769） | （F769） |
| 615 | 50770 | 重大 | （F770） | （F770） |
| 616 | 50771 | 重大 | （F771） | （F771） |
| 617 | 50772 | 重大 | 爐體移載 1 伺服警告 | Oven Transfer-1 Servo Motor Warning |
| 618 | 50773 | 重大 | 爐體移載 2 伺服警告 | Oven Transfer-2 Servo Motor Warning |
| 619 | 50774 | 重大 | 爐體移載 3 伺服警告 | Oven Transfer-3 Servo Motor Warning |
| 620 | 50775 | 重大 | 爐體移載 4 伺服警告 | Oven Transfer-4 Servo Motor Warning |
| 621 | 50776 | 重大 | 爐體移載 5 伺服警告 | Oven Transfer-5 Servo Motor Warning |
| 622 | 50777 | 重大 | （F777） | （F777） |
| 623 | 50778 | 重大 | （F778） | （F778） |
| 624 | 50779 | 重大 | （F779） | （F779） |
| 625 | 50780 | 重大 | 爐體昇降搬移 01 伺服警告 | Oven Elevator 01 Servo Motor Warning |
| 626 | 50781 | 重大 | 爐體昇降搬移 02 伺服警告 | Oven Elevator 02 Servo Motor Warning |
| 627 | 50782 | 重大 | 爐體昇降搬移 03 伺服警告 | Oven Elevator 03 Servo Motor Warning |
| 628 | 50783 | 重大 | 爐體昇降搬移 04 伺服警告 | Oven Elevator 04 Servo Motor Warning |
| 629 | 50784 | 重大 | 爐體昇降搬移 05 伺服警告 | Oven Elevator 05 Servo Motor Warning |
| 630 | 50785 | 重大 | 爐體昇降搬移 06 伺服警告 | Oven Elevator 06 Servo Motor Warning |
| 631 | 50786 | 重大 | 爐體昇降搬移 07 伺服警告 | Oven Elevator 07 Servo Motor Warning |
| 632 | 50787 | 重大 | 爐體昇降搬移 08 伺服警告 | Oven Elevator 08 Servo Motor Warning |

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| 633 | 50788 | 重大 | （F788） | （F788） |
| 634 | 50789 | 重大 | （F789） | （F789） |
| 635 | 50790 | 重大 | （F790） | （F790） |
| 636 | 50791 | 重大 | （F791） | （F791） |
| 637 | 50792 | 重大 | 爐體進料偵測有框無法回伺服原點 | Oven Load Detection Frame Cannot Return To The Servo Origin |
| 638 | 50793 | 重大 | 爐內搬移逾時未運轉 | Oven Transfer Move Over Time Error |
| 639 | 50794 | 重大 | 爐體進料有框檢知異常 | Ovev LD. Frame Check Sensor Erro |
| 640 | 50795 | 重大 | 爐體出料有框檢知異常 | Ovev ULD. Frame Check Sensor Error |
| 641 | 50796 | 重大 | （F796） | （F796） |
| 642 | 50797 | 重大 | （F797） | （F797） |
| 643 | 50798 | 重大 | （F798） | （F798） |
| 644 | 50799 | 重大 | （F799） | （F799） |
| 645 | 50800 | 重大 | （F800） | （F800） |
| 646 | 50801 | 重大 | （F801） | （F801） |
| 647 | 50802 | 重大 | （F802） | （F802） |
| 648 | 50803 | 重大 | （F803） | （F803） |
| 649 | 50804 | 重大 | 爐體昇降搬移 01 檢知異常 | Oven Elevator 01 Sensor Error |
| 650 | 50805 | 重大 | 爐體昇降搬移 02 檢知異常 | Oven Elevator 02 Sensor Error |
| 651 | 50806 | 重大 | 爐體昇降搬移 03 檢知異常 | Oven Elevator 03 Sensor Error |
| 652 | 50807 | 重大 | 爐體昇降搬移 04 檢知異常 | Oven Elevator 04 Sensor Error |
| 653 | 50808 | 重大 | 爐體昇降搬移 05 檢知異常 | Oven Elevator 05 Sensor Error |

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| 654 | 50809 | 重大 | 爐體昇降搬移 06 檢知異常 | Oven Elevator 06 Sensor Error |
| 655 | 50810 | 重大 | 爐體昇降搬移 07 檢知異常 | Oven Elevator 07 Sensor Error |
| 656 | 50811 | 重大 | （F811） | （F811） |
| 657 | 50812 | 重大 | （F812） | （F812） |
| 658 | 50813 | 重大 | （F813） | （F813） |
| 659 | 50814 | 重大 | （F814） | （F814） |
| 660 | 50815 | 重大 | （F815） | （F815） |
| 661 | 50816 | 重大 | 第 1 槽 電熱電源關閉警報 | No.1 Heater Power Breaker OFF Warning |
| 662 | 50817 | 重大 | 第 2 槽 電熱電源關閉警報 | No.2 Heater Power Breaker OFF Warning |
| 663 | 50818 | 重大 | 第 3 槽 電熱電源關閉警報 | No.3 Heater Power Breaker OFF Warning |
| 664 | 50819 | 重大 | 第 4 槽 電熱電源關閉警報 | No.4 Heater Power Breaker OFF Warning |
| 665 | 50820 | 重大 | 第 5 槽 電熱電源關閉警報 | No.5 Heater Power Breaker OFF Warning |
| 666 | 50821 | 重大 | 第 6 槽 電熱電源關閉警報 | No.6 Heater Power Breaker OFF Warning |
| 667 | 50848 | 重大 | 溫度未到達 | Temperature Not Arrived |
| 668 | 50849 | 重大 | （F849） | （F849） |
| 669 | 50850 | 重大 | （F850） | （F850） |
| 670 | 50851 | 重大 | （F851） | （F851） |
| 671 | 50852 | 重大 | 出料手臂移載伺服警告 | Unload Arm Transfer Servo Motor Warning |
| 672 | 50853 | 重大 | 出料手臂昇降伺服警告 | Unload Arm Elevator Servo Motor Warning |
| 673 | 50854 | 重大 | 出料手臂旋轉伺服警告 | Unload Arm Rotation Servo Motor Warning |
| 674 | 50855 | 重大 | 出料手臂夾框異常 | Unload Arm Frame Close (Frame Sensor) Error |

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| 675 | 50856 | 重大 | 出料手臂掉板異常 | Unload Arm Plateless Error |
| 676 | 50857 | 重大 | （F857） | （F857） |
| 677 | 50858 | 重大 | （F858） | （F858） |
| 678 | 50859 | 重大 | （F859） | （F859） |
| 679 | 50860 | 重大 | 出料開框機構有框異常 | Unload Open Frame Machine, Frame Sensor Something Error |
| 680 | 50861 | 重大 | 出料開框機構無框異常 | Unload Open Frame Machine, Frame Sensor Empty Error |
| 681 | 50862 | 重大 | 出料開框機構有框無法原點復歸警告<X53E> | Unload Open Frame Machine, Can't Return To Origin When Detecting Frame Warning<X53E> |
| 682 | 50863 | 重大 | （F863） | （F863） |
| 683 | 50864 | 重大 | （F864） | （F864） |
| 684 | 50865 | 重大 | （F865） | （F865） |
| 685 | 50866 | 重大 | （F866） | （F866） |
| 686 | 50867 | 重大 | （F867） | （F867） |
| 687 | 50868 | 重大 | 出料托框昇降有框偵測異常 | Unload Mount Frame Elevator,Frame Sensor Error |
| 688 | 50869 | 重大 | （F869） | （F869） |
| 689 | 50870 | 重大 | （F870） | （F870） |
| 690 | 50871 | 重大 | （F871） | （F871） |
| 691 | 50872 | 重大 | 進料框架回流輸送框架錯位異常 | Load Frame Reflow Conveyor, Frame Dislocation Error |
| 692 | 50873 | 重大 | 進料框架回流輸送有板異常 | Load Frame Reflow Conveyor, Plate Dislocation Error |
| 693 | 50874 | 重大 | 進料框架回流入口有框異常  <X308> | Load Frame Reflow, Entrance Frame Sensor |

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|  |  |  |  | Error<X308> |
| 694 | 50875 | 重大 | 進料框架回流輸送逾時<X30B> | Load Frame Reflow, Frame Transfer Overtime Error<X30B> |
| 695 | 50876 | 重大 | 回流擋框 1 框架輸送逾時<X064> | Frame Reflow Block-1, Frame Transfer Overtime Error<X064> |
| 696 | 50877 | 重大 | 回流擋框 2 框架輸送逾時<X065> | Frame Reflow Block-2, Frame Transfer Overtime Error<X065> |
| 697 | 50878 | 重大 | 回流滿框 1 框架輸送逾時<X066> | Frame Reflow Full-1, Frame Transfer Overtime Error<X066> |
| 698 | 50879 | 重大 | 回流滿框 2 框架輸送逾時<X067> | Frame Reflow Full-2, Frame Transfer Overtime Error<X067> |
| 699 | 50880 | 重大 | 回流滿框 3 框架輸送逾時<X068> | Frame Reflow Full-3, Frame Transfer Overtime Error<X068> |
| 700 | 50881 | 重大 | 回流滿框異常 | Frame Reflow Full Frame Error |
| 701 | 50882 | 重大 | 出料框架回流輸送有板異常 | Unload Frame Reflow Conveyor, Plate Dislocation Error |
| 702 | 50883 | 重大 | 出料框架回流輸送逾時異常 | Unload Frame Reflow, Frame Transfer Overtime Error<X07D> |
| 703 | 50884 | 重大 | （F884） | （F884） |
| 704 | 50885 | 重大 | （F885） | （F885） |
| 705 | 50886 | 重大 | （F886） | （F886） |
| 706 | 50887 | 重大 | （F887） | （F887） |
| 707 | 50888 | 重大 | （F888） | （F888） |
| 708 | 50889 | 重大 | （F889） | （F889） |
| 709 | 50890 | 重大 | （F890） | （F890） |
| 710 | 50891 | 重大 | （F891） | （F891） |

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| 711 | 50892 | 重大 | 出料平台移載伺服警告 | Unload Plateform Transfer Servo Warning |
| 712 | 50893 | 重大 | 出料平台昇降伺服警告 | Unload Plateform Elevator Servo Warning |
| 713 | 50894 | 重大 | （F894） | （F894） |
| 714 | 50895 | 重大 | （F895） | （F895） |
| 715 | 50896 | 重大 | 出料輸送卡板異常 | Unload Conveyor Stuck Plate Error |
| 716 | 50897 | 重大 | 出料機構原點復歸，出料輸送偵測有板請排除 | Unload Machine Origin， Please Exclude The Plate On The Conveyor |
| 717 | 50898 | 重大 | （F898） | （F898） |
| 718 | 50899 | 重大 | （F899） | （F899） |
| 719 | 50900 | 重大 | （F900） | （F900） |
| 720 | 50901 | 重大 | （F901） | （F901） |
| 721 | 50902 | 重大 | （F902） | （F902） |
| 722 | 50903 | 重大 | （F903） | （F903） |
| 723 | 50904 | 重大 | （F904） | （F904） |
| 724 | 50905 | 重大 | （F905） | （F905） |
| 725 | 50906 | 重大 | （F906） | （F906） |
| 726 | 50907 | 重大 | （F907） | （F907） |
| 727 | 50908 | 重大 | （F908） | （F908） |
| 728 | 50909 | 重大 | （F909） | （F909） |
| 729 | 50910 | 重大 | （F910） | （F910） |
| 730 | 50911 | 重大 | （F911） | （F911） |
| 731 | 50912 | 重大 | （F912） | （F912） |
| 732 | 50913 | 重大 | （F913） | （F913） |

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| 733 | 50914 | 重大 | （F914） | （F914） |
| 734 | 50915 | 重大 | （F915） | （F915） |
| 735 | 50916 | 重大 | （F916） | （F916） |
| 736 | 50917 | 重大 | （F917） | （F917） |
| 737 | 50918 | 重大 | （F918） | （F918） |
| 738 | 50919 | 重大 | （F919） | （F919） |
| 739 | 50920 | 重大 | （F920） | （F920） |
| 740 | 50921 | 重大 | （F921） | （F921） |
| 741 | 50922 | 重大 | （F922） | （F922） |
| 742 | 50923 | 重大 | （F923） | （F923） |
| 743 | 50924 | 重大 | （F924） | （F924） |
| 744 | 50925 | 重大 | （F925） | （F925） |
| 745 | 50926 | 重大 | （F926） | （F926） |
| 746 | 50927 | 重大 | （F927） | （F927） |
| 747 | 50928 | 重大 | （F928） | （F928） |
| 748 | 50929 | 重大 | （F929） | （F929） |
| 749 | 50930 | 重大 | （F930） | （F930） |
|  |  |  |  |  |