群翊工業

GP Automation Software

SECS/GEM Interface Document

Version 1.08

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1 - 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.

1.1 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

1.2 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.

1.2.1 Physical Connector

1.2.1.1 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

1.2.1.2 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.

1.2.2 Message Content

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

1.3 SEMI E37-0303 – HSMS Standard

1.3.1 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.

1.4 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.

1.5 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

1.6 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:

A. Each state is represented by a rectangle with rounded corners.
B. A collection of sub-states may be grouped into a super-state.
C. The entity described by the diagrams will be in one and only one of the sub-states at all times.
D. Variables representing the current state of an entity do not contain values for super-states, only the lowest sub-state is represented.
E. State transitions are shown using single-headed arrows.
F. Each state transition is a Collection Event, and it has a unique Collection Event ID (CEID)
G. 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.
H. 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.
I. 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.

2 - SEMI Standards Compliance

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

2.1 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

2.2 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

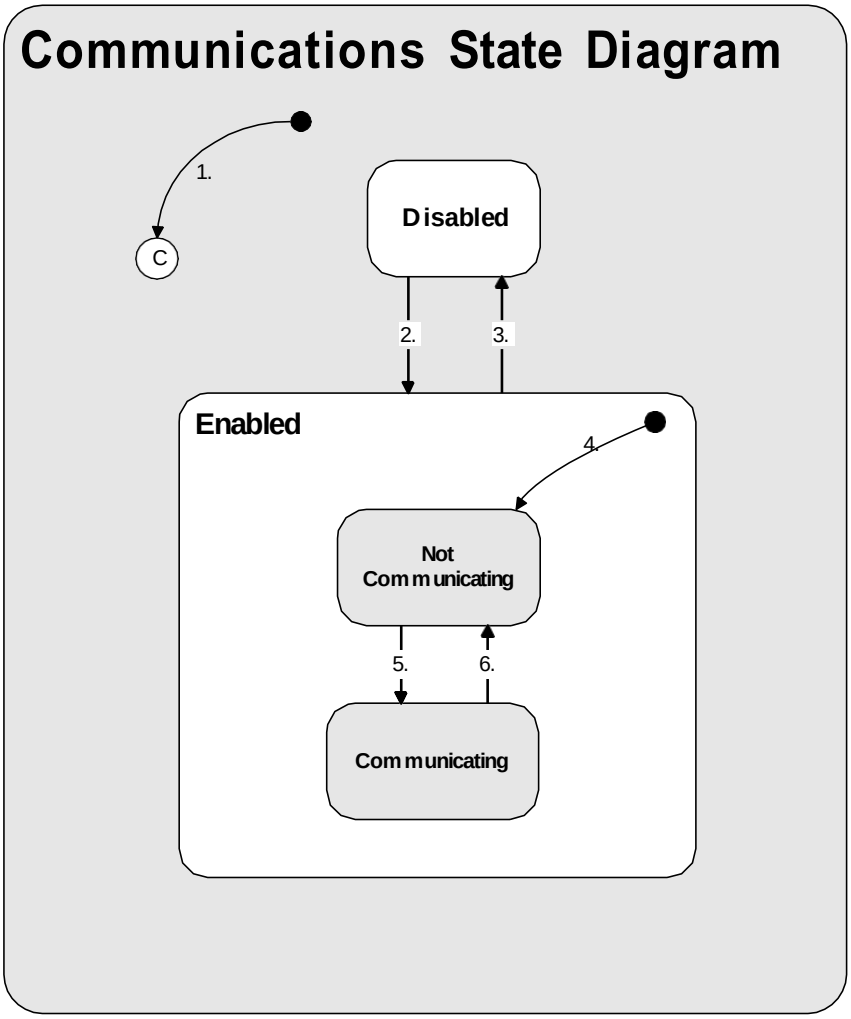
3 - GEM Capabilities

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.

3.1 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.

3.1.1 Communications State Transitions



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.*

3.1.2 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

3.1.3 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.

3.1.4 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)

3.1.5 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".

3.1.5.1 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.

3.1.5.2 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".

3.1.5.3 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.

3.1.5.4 Losing Connection, Re-Connecting

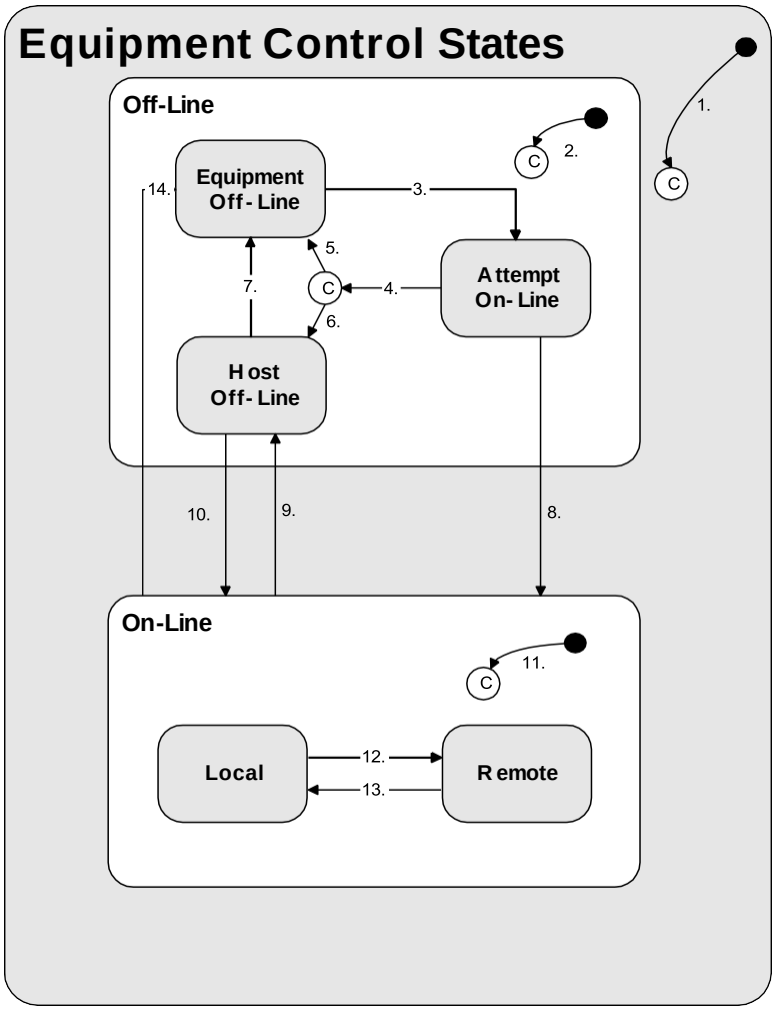
#	*SECS Message*	*Description*
1.	H <- E SxFy	Any Message. The Equipment encounters SECS block transmission errors while attempting to send a message to the Host, and reaches its Retry Limit (RTY). The Equipment considers the SECS link as disconnected.
2.	H <-E S1F13W	Connect Request. The Equipment attempts 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.

3.2 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.

3.2.1 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.



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.

3.2.1.1 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.

3.2.2 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**

3.2.3 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**

3.2.4 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.

3.2.5 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.

3.2.5.1 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.

3.2.5.2 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.

3.2.5.3 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.

3.2.5.4 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.

3.2.5.5 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.

3.2.6 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.

3.3 Data Collection

3.3.1 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).

3.3.2 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).

3.3.3 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.

3.3.4 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*.

3.3.5 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, Collection Events.

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.

3.3.6

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.

3.3.7 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.

3.3.8 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".

3.3.8.1 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.

3.3.8.2 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.

3.3.8.3 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.

3.3.8.4 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.

3.3.8.5 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.

3.3.8.6 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.

3.3.8.7 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.

3.3.8.8 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.

3.3.8.9 Host Requests Equipment Constant Namelist

3.3.8.10 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.

3.3.8.11 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.

3.4 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, Alarms.

3.4.1 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.

3.4.2 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.

3.4.3 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.

3.4.4 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>
...
>

3.4.5 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.

3.4.6 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".

3.4.6.1 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.

3.4.6.2 Host Enables/Disables Alarms

3.4.6.3 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.

3.5 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.

3.5.1 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.

3.5.2 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.

3.5.3 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.

3.5.4 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".

3.5.4.1 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.

3.5.4.2 Host Deletes Process Program

3.5.4.3 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.

3.5.4.4 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.

3.5.4.5 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.

3.5.4.6 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.

3.5.4.7 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.

3.6 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.

3.6.1 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
                >
                ...
        >
> .
```

3.6.2 Supported Remote Commands

The following remote commands are supported by GP Automation software.

3.6.2.1 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‘>
                  >

            >
      >
```

3.6.2.2 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

3.6.2.3 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

3.6.3 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".

3.6.3.1 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.

3.6.3.2 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,

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 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

3.6.4 Error Message Scenarios

3.6.4.1 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".

3.6.4.2 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".

3.6.4.3 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".

3.6.4.4 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	

3.6.4.5 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.

3.7 Equipment Terminal Services

3.7.1 Purpose

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

3.7.2 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.

3.7.3 Scenarios

3.7.3.1 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.

3.7.3.2 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.

3.7.3.3 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.

3.8 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.

3.8.1 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**

3.8.2 Clock Scenarios

3.8.2.1 Host Sets Date and Time

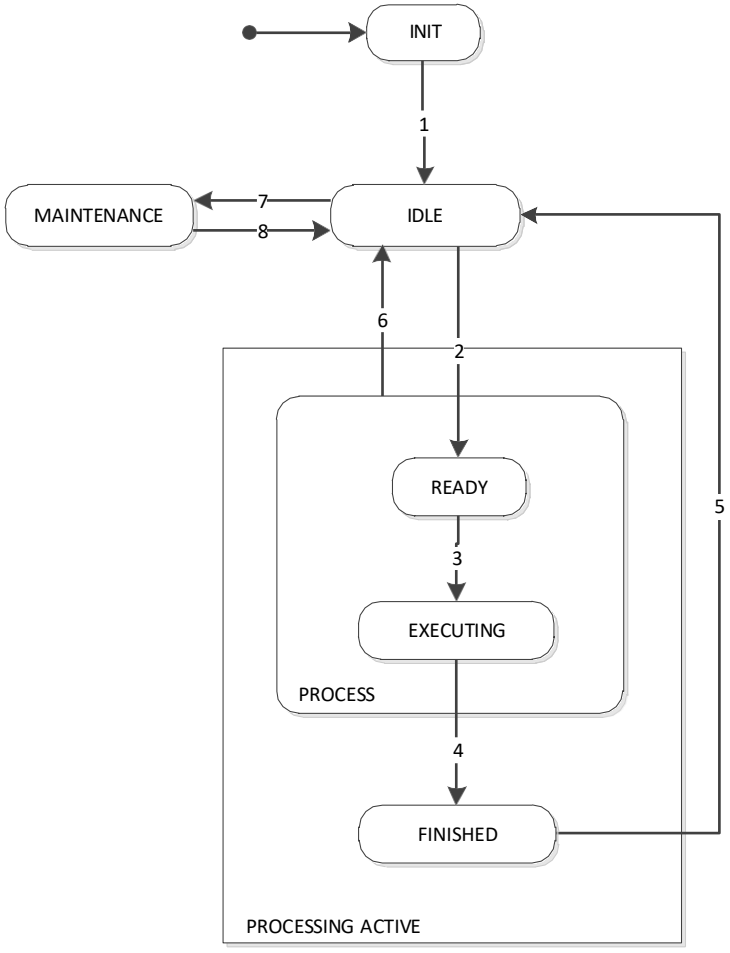
#	*SECS Message*	*Description*
1.	H -> E S2F31 W	Date and Time Send. The Host sends a new Date and Time to the Equipment.
2.	H <- E S2F32	The Equipment sets its Clock/Calendar hardware and acknowledges the command.

3.8.2.2 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.

3.9 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.



#	*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

3.9.1 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**

3.9.2 Related Events

Equipment Status Change

A Processing State model transition has occurred.

3.10 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

3.11 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

3.12 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.

3.13 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
      >
   ...
   >
> .
```

3.14 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.

3.15 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> .
```

3.16 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*
…
>
>
…
>
>

3.17 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>

3.18 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>

4 - 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.

4.1 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)

4.2 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_STATE_	GemPreviousControlState	U1
14	_GEM_PREVIOUS_PROCESS_STATE_	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**

4.3 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)

4.4 Equipment Constants

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

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

4.5 Collection Events

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

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.	

4.6 Alarms

Each alarm has its own AlarmEventOn and AlarmEventOff Collection Events.

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

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

				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

				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）

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

				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

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

			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

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

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

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

				Error
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）

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

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）

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

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

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

				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

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

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）

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

				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

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

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

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）

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

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）

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

				Error
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

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）

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）

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

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）

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）

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

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

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

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

				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）

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）

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）