ASE Titan-RandASoft Cleaner TZ-4100

SECS/GEM 200 Manual

Version

1.06

Released

2025/10/16

Index

Amendments

Date	Comments
2024/02/26	File created.
2024/03/25	Update ECID, VID, CEID, ALID
2024/8/15	1. Add SVID 200, 201 about Area Sensor 2. Update RCMD (S2F41)
2024/8/19	1. New CEID OutOfService, ReadyToLoad, and ReadyToUnload 2. Update RCMD
2025/5/13	1. Update DVID Name for TZ-4100 2. Update CCode S7F26 Format
2025/08/25	Add New VID、CEID、Report
2025/10/03	1. Add New VID 2. Update Report Data
2025/10/16	1. Add New VID

Introduction

For the goal of SECS Automation, Titan device Cleaner associates with SECS GEM (RandaSoft as follow) software. Following the protocol specify in SECS/GEM standards that developed by the SEMI organization, and it has the capability to communicate with a computer which implement the same standards.

Term Definition:

Equipment > Device(Cleaner) with RandaSoft

Host > which send SECS message to Equipment in the fab factory (like EAP).

SECS Information

Communication Parameters

The Equipment provides the following HSMS installation parameters with default value:

Parameter	Default	Description
ConnectionMode	Passive	This will be used during HSMS connection establishment.
Local IP address	xxx.xxx.xxx.xxx	Equipment IP address
Local TCP port	5000	Equipment TCP port
Remote IP address	xxx.xxx.xxx.xxx	Host IP address
Remote TCP port	5000	Host TCP port
T3	45 seconds	Reply timeout (1-120 seconds)
T5	10 seconds	Connect separation timeout(1-240 seconds)
T6	5 seconds	Control transaction timeout(1-240 seconds)
T7	10 seconds	Not selected timeout(1-240 seconds)
T8	5 seconds	Inter-character timeout(1-120 seconds)

GEM Compliance

◎ : Provide by SECS driver

○ : Provide by RandaSoft

Ⅹ : Not support

Fundamental GEM Requirements	
Equipment Processing State	○
Host Initiated S1F13/F14 Scenario	○
Event Notification	◎
On-Line Identification	○

Error Message	◎
Control Operator Initiated	○
Additional Capabilities	
Establish Communication	○
Dynamic Event Report Configuration	◎
Variable Data Collection	◎
Trace Data Collection	◎
Status Data Collection	◎
Alarm Management	◎
Remote Control	○
Equipment Constants	◎
Process Program Management	○
Material Movement	○
Equipment Terminal Services	○
Clock	◎
Limits Monitoring	X
Spooling	X
Control Host Initiated	○

SEMI Standard Compliance

SEMI Standards Versions Supported by RandaSoft	
Standard	**Description**
E4	SECS-I
E5	SECS-II RandaSoft provides only subset of E5 required by E30and E39.
E30	GEM
E37	HSMS
E37.1	HSMS-SS
E39 E39.1	Object Services

GEM and Equipment State Model

The State Model describes the GEM and Equipment behavior from Host side. All state model as following:

1. Control State Model
2. Process State Model

Control State Model

Value	State
3	Offline
4	Online/Local
5	Online/Remote

The variable GEM_CONTROL_STATE represents current control state and previous control state, and each state will be one of the following values:

Offline

In this state, it means only operators can operate this equipment, and it maybe also means disconnect between Device and RandaSoft, so Host can't get the newest information from Equipment. Any Host primary message will be replied with SnF0 Abort message unless the connect between Deviceand RandaSoft.

Online

While RandaSoft connect to Device, it will change t0 Online state, it means Equipment can accept primary message with S1F13 (Establish Communication Request) and change to Online state.

When in Online state, Host can send S1F15 (Request OFF-LINE) to Equipment and change the state to Offline/Host Offline, and any Host primary message will be replied with SnF0 Abort message unless Host change state to Online by send S1F17 (Request ON-LINE).

Online/Local

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

Online/Remote

Equipment accept S1F13 message from Host in Offline state. Operator usually can't operate Equipment in this state unless the permission.

Process State Model

Value	State
1	Down
2	Run
4	Idle

The variable Equipment and represents current process state and previous process state, and each state will be one of the following values:

Idle

When Equipment is ready to accept Host message, it will change to this state.

Run

Run is the state in which the equipment is executing a process program automatically and can continue to do so without external intervention.

Done

In this state processing is suspended and the equipment is awaiting a command.

Data Dictionary

Data Format

Format	Standard(Octal)	Hex	SML
List	00	00	L
Binary	10	08	B
Boolean	11	09	BOOLEAN
ASCII	20	10	A
JIS-8	21	11	J
8-byte Singed Integer	30	18	I8
1-byte Singed Integer	31	19	I1
2-byte Singed Integer	32	1A	I2
4-byte Singed Integer	34	1C	I4
8-byte Floating Point	40	20	F8
4-byte Floating Point	44	24	F4
8-byte Unsinged Integer	50	28	U8
1-byte Unsinged Integer	51	29	U1
2-byte Unsinged Integer	52	2A	U2
4-byte Unsinged Integer	54	2C	U4

Data Item List

Data Item	Description	Format	Length
ACKC5	Acknowledge code 0 = Accepted >0 = Error, not accepted 1-63 Reserved	Binary	1
ACKC6	Acknowledge code 0 = Accepted >0 = Error, not accepted 1-63 Reserved	Binary	1
ACKC7	Acknowledge code 0 = Accepted 1 = Permission not granted	Binary	1

	2 = Length error 3 = Matrix overflow 4 = PPID not found 5 = Mode unsupported 6 = Command will be performed with completion signaled later >6 = Other error 7-63 Reserved		
ACKC10	Acknowledge code 0 = Accepted for display 1 = Message will not be displayed 2 = Terminal not available 3-63 Reserved	Binary	1
ALCD	Alarm code with set/clear bit 8 = 1 means alarm set bit 8 = 0 means alarm cleared bit 7-1 is alarm category 0 = Not used 1 = Personal safety 2 = Equipment safety 3 = Parameter control warning 4 = Parameter control error 5 = Irrecoverable error 6 = Equipment status warning 7 = Attention flags 8 = Data integrity >8 = Other categories 9-63 Reserved	Binary	1
ALED	Alarm enable/disable bit 8 = 1 means enable alarm bit 8 = 0 means disable alarm	Binary	1
ALID	Alarm ID	U-Integer	4
ALTX	Alarm text message	ASCII	80
CEED	Collection event enable/disable code FALSE = Disable TRUE = Enable	Boolean	1
CEID	Collection event ID	U-Integer	4
COMMACK	Communications establish acknowledgement code 0 = Accepted 1 = Denied, Try Again 2-63 Reserved	Binary	1

CPNAME	Command parameter name	ACSII	m
CPACK	Command acknowledgement	Integer	1
CPVAL	Command parameter value	All	m
DATAID	Data ID	U-Integer	2
DATALENGTH	Data length	U-Integer	4
DRACK	Define report acknowledgement code 0 = Accept 1 = Denied. Insufficient space 2 = Denied. Invalid format 3 = Denied. At least one RPTID already defined 4 = Denied. At least VID does not exist 5 = Denied. At least RPTID not exist while delete >5 = Other errors 6-63 Reserved	Binary	1
EAC	Equipment acknowledgement code 0 = Acknowledge 1 = Denied. At least one constant does not exist 2 = Denied. Busy 3 = Denied. At least one constant out of range 4 = Denied. Length zero or SECS format error >4 = Other equipment-specific error 5-63 Reserved	Binary	1
ECID	Equipment constant ID	U-Integer	2
ECV	Equipment constant value	All	m
ECDEF	Equipment constant default value	All	m
ECMAX	Equipment constant maximum	All	m
ECMIN	Equipment constant minimum	All	m
ECNAME	Equipment constant name	ASCII	m
ERACK	Enable/Disable event report 0 = Accepted 1 = Denied. At least one CEID does not exist >1 = Other Errors 2-63 Reserved	Binary	1
FCNID	Function ID	U-Integer	1

LENGTH	Length of the service program or process program	U-Integer	1
LRACK	Link report acknowledgement code 0 = Accepted 1 = Denied. Insufficient space 2 = Denied. Invalid format 3 = Denied. At least one CEID link already defined 4 = Denied. At least one CEID does not exist 5 = Denied. At least one RPTID does not exist >5 = Other errors 6-63 Reserved	Binary	1
LVACK	Variable Limit definition acknowledgement code 1 = Variable does not exist 2 = Variable has no limits capability 3 = Variable repeated in message 4 = Limit value error as described in LIMITACK 5-63 Reserved	Binary	1
MDLN	Equipment model type Same data as returned by S1,F2	ACSII	6
MHEAD	SECS message block header associated with message block in error	Binary	10
OFLACK	Acknowledgement code for off-line request 0 = OFF-LINE Acknowledge 1-63 Reserved	Binary	1
ONLACK	Acknowledgement code for on-line request 0 = ON-LINE Accepted 1 = ON-LINE Not Allowed 2 = Equipment Already ON-LINE 3-63 Reserved	Binary	1
PPBODY	Process program body The process program describes to the equipment, in its own language, the actions to be taken in processing the material it receives.	Binary	M
PPGNT	Process program grant status 0 = OK	Binary	1

	1 = Already have 2 = No space 3 = Invalid PPID 4 = Busy, try later 5 = Will not accept >5 = Other error 6-63 Reserved		
PPID	Process program ID Limited to a maximum of 80 bytes. The format used in the PPID will be host-dependent. For internal use of the equipment, the PPID can be treated as a unique binary pattern. If the local equipment is not prepared to display the transmitted code, the display should be in hexadecimal form.	ASCII	Max 80
RCMD	Remote command	ASCII	m
RPTID	Report ID	U-Integer	2
SHEAD	Message header of sent block	Binary	10

Collected event (CEID)

CEID	NAME	RPTID	Description
24	GEM Control State OffLine	1	Notify Host of control state change to Offline
25	GEM Control State OnLine Local	1	Notify Host of control state change to Online-Local
26	GEM Control State OnLine Remote	1	Notify Host of control state change to Online-Remote
100	Equipment State Change	2	Equipment State Change
101	Equipment Auto Mode	3	Equipment Auto Mode
102	Equipment Manual Mode	3	Equipment Manual Mode
103	LD Read Panel ID	4	LD Read Panel ID
104	ULD Read Panel ID	4	ULD Read Panel ID
105	EDC Report	6	EDC Report
106	Change Recipe	7	Recipe Change

107	LD Read Magazine ID	8	LD Read Magazine ID
108	ULD Read Magazine ID	12	ULD Read Magazine ID
109	LD Fin	8	Loader Magazine Move Out Position
110	ULD Fin	11	UnLoader Magazine Move Out Position
111	ULD Transfer In Magazine	10	UnLoader Panel Move To Magazine
112	ULD Panel Full	12	UnLoader Panel Move To Magazine Full
200	Slot Mapping	9	Slot Mapping
201	LD Earse Magazine	8	LD Earse Magazine
202	ULD Earse Magazine	12	ULD Earse Magazine
203	LD Earse Panel	5	LD Earse Panel
204	ULD Earse Panel	10	ULD Earse Panel
205	Wafter Clean Earse Panel	4	Wafter Clean Earse Panel
206	Start Rsp	1	Equipment Idle To Running

Report (RPTID)

RPTID	VID	Type	Description
1	31	SV	GEM CLOCK
	107	SV	GEM Control State
2	31	SV	GEM CLOCK
	110	SV	Equipment Status
3	31	SV	GEM CLOCK
	109	SV	Equipment Auto Manual
4	31	SV	GEM CLOCK
	113	DV	Panel ID
	112	DV	Result
5	31	SV	GEM CLOCK
	113	DV	Panel ID
6	31	SV	GEM CLOCK

	113	DV	Panel ID
	114	DV	EDC Fisish Time
	115	DV	DI Tank 1 Temperature
	116	DV	DI Tank 2 Temperature
	117	DV	DI Tank 3 Temperature
	118	DV	DI Tank 1 UP Nozzle Pressure
	119	DV	DI Tank 2 UP Nozzle Pressure
	120	DV	DI Tank 3 UP Nozzle Pressure
	121	DV	DI Tank 1 DW Nozzle Pressure
	122	DV	DI Tank 2 DW Nozzle Pressure
	123	DV	DI Tank 3 DW Nozzle Pressure
	124	DV	Air_Dry 1 Tank Pressure
	125	DV	Air_Dry 2 Tank Pressure
	126	DV	Conductoscope
	127	DV	Conveyor Speed
7	31	SV	GEM CLOCK
	112	DV	Result
	128	DV	Recipe No
	129	DV	Recipe Name
8	31	DV	GEM CLOCK
	130	DV	Magazine ID
9	31	DV	GEM CLOCK
	131	DV	SlotMapping
10	31	SV	GEM CLOCK
	113	DV	Panel ID
	132	DV	Slot ID
11	31	SV	GEM CLOCK
	134	DV	UL Magazine ID
	133	DV	ULD Panel IDs

12	31	DV	GEM CLOCK
	134	DV	UL Magazine ID

Variables ID (EC, SV and DV)

VID	Type	NAME	Format	Description
Equipment Constant ID				
1	EC	DefaultOnlineState	U1	Online Defalut: 0: Local 1: Remote default = <U1 0>
21	EC	GEM_TIME_FORMAT	U1	GEM CLOCK Format 0:12<YYMMDDhhmmss> 1:16<YYYYMMDDhhmmssff> Default = <U1 1>
22	EC	GEM_WBIT_S5	U1	S5F1 0: No Reply 1: Reply default = <U1 0>
23	EC	GEM_WBIT_S6	U1	S6F1 and S6F11 Reply 0: No Reply 1: Reply default = <U1 0>
24	EC	GEM_WBIT_S10	U1	S10F1 and S1F3 Reply 0: No Reply 1: Reply default = <U1 0>
100	EC	Start Time Of Save Water	U4	1 ~ 6553

101	EC	Time Of Auto Turn Off Light	U4	1 ~ 6553
102	EC	Stuck Monitor	U4	1 ~ 6553
Status Variable ID				
31	SV	GEM CLOCK	A	Date and Time
100	SV	GEM MDLN	A	Equipment model type
101	SV	GEM SOFTREV	A	Software Reversion
102	SV	Current Recipe No	U1	Current Recipe No
103	SV	Current Recipe Name	A	Current Recipe Name
107	SV	GEM Control State	U1	Current control state value: 1: Offline/Equipment offline 2: Offline/Attempt online 3: Offline/Host offline 4: Online/Local 5: Online/Remote
108	SV	GEM Previous Control State	U1	Previous control state value: 1: Offline/Equipment offline 2: Offline/Attempt online 3: Offline/Host offline 4: Online/Local 5: Online/Remote
109	SV	Equipment Auto Manual	U4	0: Manual 1: Auto
110	SV	Equipment Status	U1	1: Init 2: Idle 3: Setup 4: Ready

				5: Executing 6: Pause
111	SV	History Cleaned Count	U4	History Cleaned Count
200	SV	Loader Area Sensor	Boolean	False: Off True: On
201	SV	Unloader Area Sensor	Boolean	False: Off True: On
200	SV	LD In State	U1	Loader can be put in magazine state
201	SV	LD Out State	U1	Loader can be put out magazine state
202	SV	ULD In State	U1	UnLoader can be put in magazine state
203	SV	ULD Out State	U1	UnLoader can be put out magazine state
204	SV	LD UP Count	U1	Loader upper shelf Count
205	SV	LD DW Count	U1	Loader lower shelf Count
206	SV	ULD UP Count	U1	UnLoader upper shelf Count
207	SV	ULD DW Count	U1	UnLoader lower shelf Count
Data Variable ID				
112	DV	Result	U1	Result
113	DV	Panel ID	A	Panel ID
114	DV	EDC Fisish Time	A	EDC Fisish Time
115	DV	Ultrasonic Tank Temperature	F4	Ultrasonic Tank Temperature
116	DV	Dryer Heat 1 Temperature	F4	Dryer Heat 1 Temperature
117	DV	Dryer Heat 2 Temperature	F4	Dryer Heat 2 Temperature
118	DV	Water In Flow	F4	Water In Flow
119	DV	Ultrasonic Water Flow 1	F4	Ultrasonic Water Flow 1
120	DV	Ultrasonic Water Flow 2	F4	Ultrasonic Water Flow 2
121	DV	UP Nozzle Pressure	F4	UP Nozzle Pressure
122	DV	DW Nozzle Pressure	F4	DW Nozzle Pressure

123	DV	Liquid Pressure	F4	Liquid Pressure
124	DV	Air_Dry 1 Tank Pressure	F4	Air_Dry 1 Tank Pressure
125	DV	Air_Dry 2 Tank Pressure	F4	Air_Dry 2 Tank Pressure
126	DV	Conductoscope	F4	Conductoscope
127	DV	Conveyor Speed	F4	Conveyor Speed
128	DV	Recipe No	U1	Recipe No
129	DV	Recipe Name	A	Recipe Name
130	DV	L Magazine ID	A	Load Magazine ID
131	DV	SlotMapping	L	SlotMapping
132	DV	Slot ID	U1	Slot ID
133	DV	ULD Panel IDs	L	ULD Panel IDs
134	DV	UL Magazine ID	A	UnLoad Magazine ID

Alarm (ALID)

ALID	ALTX
500	EMO1
501	EMO2
502	DI Tank 1 EGO
503	DI Tank 2 EGO
504	DI Tank 3 EGO
505	Leakage Sensor 1
506	Leakage Sensor 2
507	Leakage Sensor 3
508	DI 1 Pump Conditioner
509	DI 2 Pump Conditioner
510	DI 3 Pump Conditioner
511	Drying 1 Blower Conditioner
512	Drying 2 Blower Conditioner

513	Conveyor Conditioner
514	Reserve
515	Reserve
516	Reserve
517	Reserve
518	Reserve
519	Reserve
520	Reserve
521	Reserve
522	Reserve
550	Buffer Tank HH
551	DI Tank 1 HH
552	DI Tank 2 HH
553	DI Tank 3 HH
554	DI Tank 1 L
555	DI Tank 2 L
556	DI Tank 3 L
557	DI Tank 1 Temperature Hight
558	DI Tank 2 Temperature Hight
559	DI Tank 3 Temperature Hight
560	Reserve
561	Reserve
562	DI Tank 1 Temperature Low
563	DI Tank 2 Temperature Low
564	DI Tank 3 Temperature Low
565	Reserve

566	Reserve
567	Stuck
568	DI Tank 1 UP Pressure Hight
569	DI Tank 1 UP Pressure Low
570	DI Tank 1 DW Pressure Hight
571	DI Tank 1 DW Pressure Low
572	DI Tank 2 UP Pressure Hight
573	DI Tank 2 UP Pressure Low
574	DI Tank 2 DW Pressure Hight
575	DI Tank 2 DW Pressure Low
576	DI Tank 3 UP Pressure Hight
577	DI Tank 3 UP Pressure Low
578	DI Tank 3 DW Pressure Hight
579	DI Tank 3 DW Pressure Low
580	Drying 1 Blower Pressure Hight
581	Drying 1 Blower Pressure Low
582	Drying 2 Blower Pressure Hight
583	Drying 2 Blower Pressure Low
584	Chain Fail
585	Save Water And Power Mode
586	Conductoscope Over Low
587	SMEMA In No Signal
588	Pump 1 Maximum Frequency
589	Pump 2 Maximum Frequency
590	Pump 3 Maximum Frequency
591	Blower Conditioner 1 Maximum Frequency

592	Blower Conditioner 2 Maximum Frequency
593	Reserve
594	Reserve
595	Reserve
596	Reserve
597	Reserve
598	Reserve
599	Reserve
600	Reserve
601	Reserve
602	Reserve
603	Reserve
604	Reserve
605	Reserve
606	Reserve
607	Reserve
608	Reserve
609	Reserve
610	Reserve
611	Reserve
612	Reserve
613	Reserve
614	Reserve
615	Reserve
616	Reserve
617	Reserve

SECS Message Support

Stream 1 Equipment State

Stream Function	Description	Direction
S1F0	Abort Transaction Header only.	H<E
S1F1	Are You There Request Header only.	H<>E
S1F2	On Line Data L, 2 1. <MDLN> 2. <SOFTREV>	H<>E
S1F3	Selected Equipment Status Request L, n 1. <$SVID_1$> . . n. <$SVID_n$>	H>E
S1F4	Selected Equipment Status Data L, n 1. <$SV\ Data_1$> . . n. <$SVData_n$>	H<E

S1F11	Status Variable Namelist Request L, n 1. <$SVID_1$> . . n. <$SVID_n$>	H>E
S1F12	Status Variable Namelist Request Reply L,n 1. L, 3 1. <$SVID_1$> 2. <$SVNAME_1$> 3. <$UNITS_1$> 2. L, 3 . . n. L, 3 1. <$SVID_n$> 2. <$SVNAME_n$> 3. <$UNITS_n$>	H<E
S1F13	Communication Request L, 2 1. <MDLN> 2. <SOFTREV>	H>E
S1F14	Communications Request Acknowledge L, 2 1. <COMMACK> 2. L, 2 1. <MDLN> 2. <SOFTREV>	H<E

S1F15	Request OFFLINE Header only.	H>E
S1F16	OFFLINE Acknowledge <OFLACK>	H<E
S1F17	Request ONLINE Header only.	H>E
S1F18	ONLINE Acknowledge <ONLACK>	H<E

Stream 2 Equipment Control and Diagnostics

Stream Function	Description	Direction
S2F0	Abort Transaction Header only.	H<E
S2F13	Equipment Constant Request L, n 1. <$ECID_1$> . . n. <$ECID_n$>	H>E
S2F14	Equipment Constant Data L, n 1. <ECV_1>	H<E

	. . n. <ECV$_n$>	
S2F15	New Equipment Constant Send L, n 1. L, 2 1. <ECID$_1$> 2. <ECV$_1$> 2. L, 2 . . n. L, 2 1. <ECID$_n$> 2. <ECV$_n$>	H>E
S2F16	New Equipment Constant Acknowledge <EAC>	H<E
S2F17	Date and Time Request Header only.	H>E
S2F18	Date and Time Data <TIME>	H<E
S2F23	Trace Initialize Send L, 5 1. <TRID> 2. <DSPER> 3. <TOTSMP> 4. <REPGSZ>	H>E

	5. L, n 1. <$SVID_1$> . . n. <$SVID_n$>	
S2F24	Trace Initialize Acknowledge <TIAACK>	H<E
S2F29	Equipment Constant Namelist Request L, n 1. <$ECID_1$> . . n. <$ECID_n$>	H>E
S2F30	Equipment Constant Namelist L, n 1. L, 6 1. < $ECID_1$> 2. < $ECNAME_1$> 3. < $ECMIN_1$> 4. < $ECMAX_1$> 5. < $ECDEF_1$> 6. < $UNITS_1$> 2. L, 6 . . n. L, 6 1. <$ECID_n$> 2. <$ECNAME_n$> 3. <$ECMIN_n$> 4. <$ECMAX_n$>	H<E

	5. <ECDEF$_n$> 6. <UNITS$_n$>	
S2F31	Date and Time Set <TIME>	H>E
S2F32	Date and Time Acknowledge <TIACK>	H<E
S2F33	Define Report L, 2 1. <DATAID> 2. L, a # reports 1.L, 2 report 1 1. <RPTID$_1$> 2. L, b # VIDs this report 1. <VID$_1$> . . b. <VID$_b$> 2. L, 2 report 2 . . a. L, 2 report a 1. <RPTID$_a$> 2. L, c # VIDs this report 1. <VID$_1$> . . b. <VID$_c$>	H>E
S2F34	Define Report Acknowledge	H<E

	<DRACK>	
S2F35	Link Event Report L, 2 1. <DATAID> 2. L, a # events 1. L, 2 event 1 1. <$CEID_1$> 2. L, b # RPTIDs this event 1. <$RPTID_1$> . . b. <$RPTID_b$> 2. L, 2 event 2 . . a. L, 2 event a 1. <$CEID_a$> 2. L, c # RPTIDs this event 1. <$RPTID_1$> . . b. <$RPTID_c$>	H>E
S2F36	Link Event Report Acknowledge <LRACK>	H<E
S2F37	Enable/Disable Event Report L, 5 1. <CEED> enable/disable 2. L, n 1. <$CEID_1$> .	H>E

	. n. <CEID$_n$>	
S2F38	Enable Event Report Acknowledge <ERACK>	H<E
S2F41	Host Command Send Remote Command(RCMD) supports: PP-SELECT: Select a PPID for processing. Reply NAK, if the PPID does not exist in the matching Device. START: Start the lot processing. Reply NAK, if the equipment is unable to start processing. GO-REMOTE: Set EQ CIM Status is Remote. GO-LOCAL: Set EQ CIM Status is Local. STOP: If the equipment is unable to stop processing.(Cycle Stop) CANCELMAGAZINE: Remove magazine after slotmapping fail Magazine1D_OK: Host confirm Magazine ID while 1D read at Loader Magazine1D_NG: Host cancel Magazine while 1D read at Loader Substrate2D_OK: Host confirm substrate 2D while 2D read at Loader Substrate2D_NG: Host cancel substrate while 2D read at Loader MagazineRelease: Host Release Magazine ULD <AGV Command> LOADER_LOAD LOADER_UNLOAD UNLOADER_LOAD UNLOADER_UNLOAD ~~OPEN-DOOR: Ask Loader / Unloader open the door~~ ~~CLOSE-DOOR: Ask Loader / Unloader close the door~~ L, 2 1. <A RCMD> 2. L, 1	H>E

	1. L, n 1. <CPNAME$_n$> 2. <CPVAL$_n$> < n = 1 > ~~OPEN_DOOR / CLOSE_DOOR~~ ~~<A>CPNAME$_1$: PortID~~ ~~<U1>CPVAL$_1$:~~ PP-SELECT <A>CPNAME$_1$: PPID <A>CPVAL$_1$: < n = 2 > CANCELMAGAZINE <A>CPNAME$_1$: PortID <U1>CPVAL$_1$: <A>CPNAME$_1$: MagazineID <A>CPVAL$_1$: START <A>CPNAME$_1$: MagazineID <A>CPVAL$_1$: <A>CPNAME$_2$: SubstrateQty <A>CPVAL$_2$: LOADER_LOAD LOADER_UNLOAD UNLOADER_LOAD UNLOADER_UNLOAD <n=1> <A>CPNAME$_1$: ACTION <A>CPVAL:START or END	

	< n = 0 > Other Command	
S2F42	Host Command Acknowledge L, 2 1. <HCACK> 0: Acknowledge, command has been performed. 1: Command does not exist. 2: Cannot perform now. 3: At least one parameter is invalid. 4: Acknowledge,command will be performed with completion signaled later.	H<E

Stream 5 Exception Handling

Stream Function	Description	Direction
S5F0	Abort Transaction Header only.	H<E
S5F1	Alarm Report Send L, 3 1. <ALCD> 2. <ALID> 3. <ALTX>	H<E
S5F2	Alarm Report Acknowledge <ACKC5>	H>E
S5F3	Enable/Disable Alarm Send L, 2 1. <ALED>	H>E

	2. <ALID>	
S5F4	Enable/Disable Alarm Acknowledge <ACKC5>	H<E
S5F5	List Alarm Request <$ALID_1$, … , $ALID_n$>	H>E
S5F6	List Alarm Data L, m 1. L, 3 1. <$ALCD_1$> 2. <$ALID_1$> 3. <$ALTX_1$> 2. L, 3 . . m. L, 3 1. <$ALCD_m$> 2. <$ALID_m$> 3. <$ALTX_m$>	H<E
S5F7	List Enabled Alarm Request Header only.	H>E
S5F8	List Enabled Alarm Data L, m 1. L, 3 1. <$ALCD_1$> 2. <$ALID_1$> 3. <$ALTX_1$>	H<E

	2. L, 3 . . m. L, 3 1. <ALCD$_m$> 2. <ALID$_m$> 3. <ALTX$_m$>	

Stream 6 Data Collection

Stream Function	Description	Direction
S6F1	Trace Data Send L, 4 1. <TRID> 2. <SMPLN> 3. <STIME> 4. L, n 1. <SV$_1$> . n. <SV$_n$>	H<E
S6F2	Trace Data Acknowledge <ACKC6>	H>E
S6F11	Event Report Send L, 3 1. <DATAID> 2. <CEID> 3. L, n 1. L,2 1. <DSID$_1$> 2. L, m 1. L, 2	H<E

	1. <DVNAME$_1$> 2. <DVVAL$_1$> 2. L, 2 . . m. L, 2 1. <DVNAME$_m$> 2. <DVVAL$_m$> 2. L, 2 . . n. L, 2 1.<DSID$_n$> 2. etc.	
S6F12	Event Report Acknowledge <ACKC6>	H>E

Stream 7 Process Program Management

Stream Function	Description	Direction
S7F0	Abort Transaction Header only.	H<E
S7F5	Process Program Request <PPID>	H>E
S7F6	Process Program Data L,2 1. <PPID> 2. <PPBODY>	H<E
S7F19	Current PPList Request Header only.	H>E

S7F20	Current PPList Data L, n 1. <$PPID_1$> . . n. <$PPID_n$>	H<E

Stream 9 Terminal Services

Stream Function	Description	Direction
S9F1	Unrecognized Device ID <MHEAD>	H<E
S9F3	Unrecognized Stream Type <MHEAD>	H<E
S9F5	Unrecognized Function Type <MHEAD>	H<E
S9F7	Illegal Data <MHEAD>	H<E
S9F9	Transaction Timer Timeout <SHEAD>	H<E

Stream 10 Terminal Services

Stream Function	Description	Direction
S10F0	Abort Transaction	H<E

	Header only.	
S10F1	Terminal Request L,2 1. <TID> 2. <TEXT>	H<E
S10F2	Terminal Request Acknowledge <ACKC10>	H>E
S10F3	Terminal Display, Single L, 2 1. <TID> 2. <TEXT>	H>E
S10F4	Terminal Display, Single Acknowledge <ACKC10>	H<E

CCode (S7F26 Format Example)

Item	Type	Direction
L,2		
CCODE	A	1000
L,1		
Param	A	設定值-超音波槽溫度上限值
L,2		
CCODE	A	1001
L,1		
Param	A	設定值-超音波槽溫度設定值
L,2		
CCODE	A	1002
L,1		
Param	A	設定值-超音波槽溫度下限值
L,2		
CCODE	A	1003
L,1		
Param	A	設定值-烘乾加熱#1 溫度上限值
L,2		
CCODE	A	1004
L,1		
Param	A	設定值-烘乾加熱#1 溫度設定值
L,2		
CCODE	A	1005
L,1		
Param	A	設定值-烘乾加熱#1 溫度下限值
L,2		
CCODE	A	1006
L,1		
Param	A	設定值-烘乾加熱#2 溫度上限值
L,2		
CCODE	A	1007
L,1		
Param	A	設定值-烘乾加熱#2 溫度設定值
L,2		

CCODE	A	1008
L,1		
Param	A	設定值-烘乾加熱#2 溫度下限值
L,2		
CCODE	A	1009
L,1		
Param	A	設定值-上噴嘴壓力值上限值
L,2		
CCODE	A	1010
L,1		
Param	A	設定值-上噴嘴壓力值下限值
L,2		
CCODE	A	1011
L,1		
Param	A	設定值-下噴嘴壓力值上限值
L,2		
CCODE	A	1012
L,1		
Param	A	設定值-下噴嘴壓力值下限值
L,2		
CCODE	A	1013
L,1		
Param	A	設定值-風乾槽差壓上限值
L,2		
CCODE	A	1014
L,1		
Param	A	設定值-風乾槽差壓下限值
L,2		
CCODE	A	1015
L,1		
Param	A	設定值-烘乾加熱#1 差壓上限值
L,2		
CCODE	A	1016
L,1		
Param	A	設定值-烘乾加熱#1 差壓下限值
L,2		
CCODE	A	1017

L,1		
Param	A	設定值-烘乾加熱#2 差壓上限值
L,2		
CCODE	A	1018
L,1		
Param	A	設定值-烘乾加熱#2 差壓下限值
L,2		
CCODE	A	1019
L,1		
Param	A	設定值-純水入水流量上限值
L,2		
CCODE	A	1020
L,1		
Param	A	設定值-純水入水流量下限值
L,2		
CCODE	A	1021
L,1		
Param	A	設定值-水簾式超音波水流量 1 上限值
L,2		
CCODE	A	1022
L,1		
Param	A	設定值-水簾式超音波水流量 1 下限值
L,2		
CCODE	A	1023
L,1		
Param	A	設定值-水簾式超音波水流量 2 上限值
L,2		
CCODE	A	1024
L,1		
Param	A	設定值-水簾式超音波水流量 2 下限值
L,2		
CCODE	A	1025
L,1		
Param	A	設定值-電導度計上限值
L,2		
CCODE	A	1026
L,1		

Param	A	設定值-輸送速度
L,2		
CCODE	A	1041
L,1		
Param	A	設定值-噴嘴壓力值
L,2		
CCODE	A	1042
L,1		
Param	A	設定值-風乾槽差壓
L,2		
CCODE	A	1043
L,1		
Param	A	設定值-烘乾加熱#1 差壓
L,2		
CCODE	A	1044
L,1		
Param	A	設定值-烘乾加熱#2 差壓