DFR Develop SECS/GEM Specification

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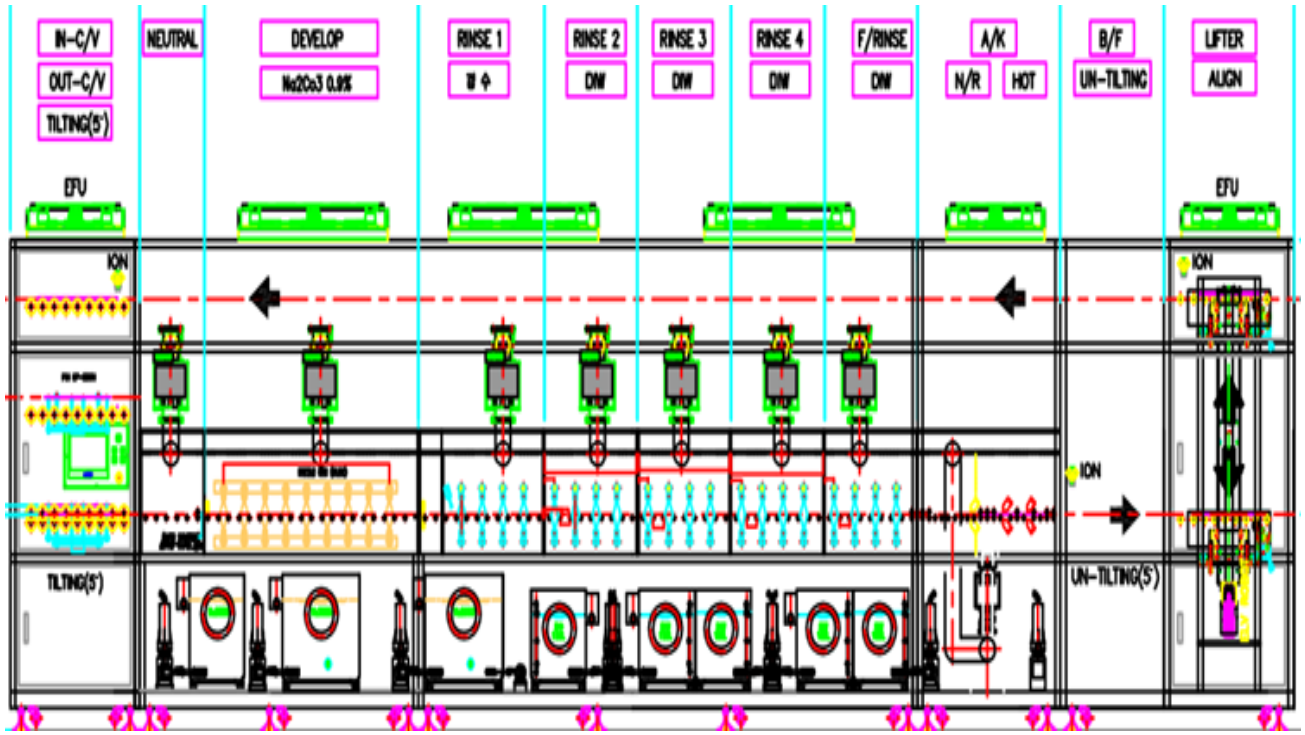
Revision History

Ver	Date	Chapter	Description
1.0.0	2023-04-15		Draft
1.0.1	2023-04-24		Control Job, Process Job 삭제
1.0.2	2023-07-06		이벤트 추가 (CEID=1321 GlassScrapComplete)

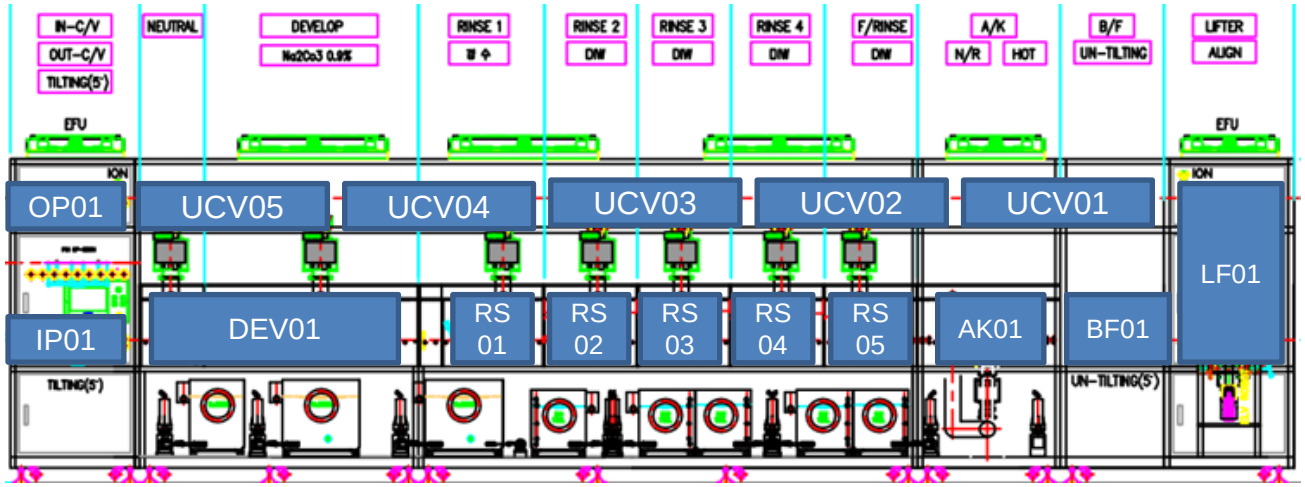
CONTENTS

1. DFR DEVELOP Equipment Specifications

1.1 Layout



1.2 Location ID LIST



EQPID	Module	Description	Location ID
AP-TG-05	In-C/V	EFEM으로부터 받는 투입 C/V	**IP01**
	DEVELOP	NT01로부터 받음	**DEV01**
	RINSE 1	DEV01로부터 받음	**RS01**
	RINSE 2	RS01로부터 받음	**RS02**
	RINSE 3	RS02로부터 받음	**RS03**
	RINSE 4	RS03로부터 받음	**RS04**
	Final RINSE	RS04로부터 받음	**RS05**
	Air Knife	RS05로부터 받음	**AK01**
	Buffer	AK01로부터 받음	**BF01**
	Lifter	BF01로부터 받음	**LF01**
	Upper-C/V	Lifter로부터 받고, 상단 C/V를 거쳐 OP01로 반송	**UCV01~UCV05**
	Out-C/V	UCV01로부터 받고, EFEM으로 배출 C/V	**OP01**

2.1 CEID(Collected Event ID)

2.1.1 CEID LIST(1)

CEID	Event	Description
1001	ControlStateOffline	Equipment control state turn into OFFLINE
1002	ControlStateLocal	Equipment control state turn into ONLINE LOCAL
1003	ControlStateRemote	Equipment control state turn into ONLINE REMOTE
1015	EquipmentConstantChanged	Equipment Constant is changed
1031	AlarmDetected	alarm occurred
1032	AlarmCleared	alarm cleared
1051	EquipmentStateChanged	Equipment State is changed
1061	OperationIDChanged	Events that occur when worker information registered in the HMI is changed
1101	ModuleStart	Glass started operating on module
1102	ModuleEnd	Glass completed operating on module
1201	SubstrateLocationOccupied	Glass loaded into module
1202	SubstrateLocationUnoccupied	Glass ejected into module
1301	GlassStart	First Glass arrived first module
1302	GlassEnd	Last Glass departed last module
1311	GlassStartEach	Each Glass arrived first module
1312	GlassEndEach	Each Glass departed last module
1401	ProcessData	Glass Process Data

2.2 EC(Equipment Constant)

2.2.1 EC LIST(1)

ID	Name	Type	Unit	Min	Max	Def	Description
101	EqpName	A		AP-TG-05	AP-TG-05	AP-TG-05	DFR Develop Equipment Name
102	SessionID	U2		0	65535	0	HSMS Session ID
103	HsmsLinkTestInterval	U4	sec	10	86400	120	HSMS Link Test Period
104	EstablishCommnucationsTimeout	U4	sec	2	120	10	Timeout for Establish Commnunication Message
105	TimeFormat	U4		0	1	1	0 = 12 bytes format "YYMMDDhhmmss" 1 = 16 bytes format "YYYYMMDDhhmmsscc"
106	T3TimeOut	U4	sec	1	120	45	HSMS T3 Time
107	T5TimeOut	U4	sec	1	240	10	HSMS T5 Time
108	T6TimeOut	U4	sec	1	240	5	HSMS T6 Time
109	T7TimeOut	U4	sec	1	240	10	HSMS T7 Time
110	T8TimeOut	U4	sec	1	240	5	HSMS T8 Time
111	UseS6F1Reply	Bo		false	true	false	true = need S6F1Reply (S6F2)

2.3 SVID(State Variable ID)

2.3.1 SVID LIST(1)

ID	Name	TYPE	Description
200	CommState	U4	0 = Undefined 1 = Disabled 2 = Enabled / Not Communicating 3 = Equipment-Initiated Connect / Wait Delay 4 = Equipment-Initiated Connect / Wait CRA 5 = Host-Initiated Connect / Wait CR from Host 6 = Communicating
201	ControlState	U4	1 = Equipment-Offline 2 = Attempt Online 3 = Host Offline 4 = Online-Local 5 = Online-Remote
202	PreviousControlState	U4	Previous Control state
203	EqpState	U4	1 = Idle 2 = Run 3 = Maintenance 4 = Down
204	PreviousEqpState	U4	Previous Eqp State
205	UserId	A	userId (current)
206	PreviousUserId	A	last userid
210	EventsEnabled	L	L,n n = # of events enabled 1.<CEID_1> … n.<CEID_n>
211	AlarmsEnabled	L	L,n n = # of alarms enabled 1.<ALID_1> … n.<ALID_n>
212	AlarmsSet	L	L,n n = # of alarms setted 1.<ALID_1> … n.<ALID_n>
220	MDLN	A	"DFR" Equipment Model Type. Same data as returned by S1,F2
221	SOFTREV	A	Software revision code.

2.3 SVID(State Variable ID)

2.3.1 SVID LIST(2)

ID	Name	TYPE	Description
11001	PV_MotorSpeed	F4	Motor Speed 설정
11101	DEV01_PV_MixingTank_Concentration	F4	Mixing tank 농도
11102	DEV01_PV_MixingTank_SupplyFlowRate	F4	Mixing tank 공급 유량
11103	DEV01_PV_MixingTank_FlowRate	F4	Mixing tank 유량
11111	DEV01_PV_StorageTank_Conductivity	F4	Storage Tank 전도도
11112	DEV01_PV_StorageTank_Concentration	F4	Storage Tank 농도
11113	DEV01_PV_StorageTank_Temperature	F4	Storage Tank 온도
11121	DEV01_PV_Na2CO3Tank_Concentration	F4	Na2CO3(공급) Tank 농도
11122	DEV01_PV_Na2CO3Tank_Temperature	F4	Na2CO3(공급) Tank 온도
11131	DEV01_PV_DevelopZone_UpPressure	F4	Develop Zone 상 압력
11132	DEV01_PV_DevelopZone_DownPressure	F4	Develop Zone 하 압력
13101	AK01_PV_Temperature	F4	A/knife 온도(Hot A/Knife)

2.3 SVID(State Variable ID)

2.3.1 SVID LIST(3)

ID	Name	TYPE	Description
20101	IP01_GlassID	A	Glass ID for IP01
20102	IP01_PPID	A	EFEM PPID for IP01
20103	IP01_PortID	U2	EFEM Port ID for IP01
20104	IP01_CarrierID	A	EFEM Carrier ID for IP01
20105	IP01_LotID	A	EFEM Lot ID for IP01
20106	IP01_SlotNo	U2	EFEM Slot No for IP01
20201	DEV01_GlassID	A	Glass ID for DEV01
20202	DEV01_PPID	A	EFEM PPID for DEV01
20203	DEV01_PortID	U2	EFEM Port ID for DEV01
20204	DEV01_CarrierID	A	EFEM Carrier ID for DEV01
20205	DEV01_LotID	A	EFEM Lot ID for DEV01
20206	DEV01_SlotNo	U2	EFEM Slot No for DEV01
20301	RS01_GlassID	A	Glass ID for RS01
20302	RS01_PPID	A	EFEM PPID for RS01
20303	RS01_PortID	U2	EFEM Port ID for RS01
20304	RS01_CarrierID	A	EFEM Carrier ID for RS01
20305	RS01_LotID	A	EFEM Lot ID for RS01
20306	RS01_SlotNo	U2	EFEM Slot No for RS01
20401	RS02_GlassID	A	Glass ID for RS02
20402	RS02_PPID	A	EFEM PPID for RS02
20403	RS02_PortID	U2	EFEM Port ID for RS02
20404	RS02_CarrierID	A	EFEM Carrier ID for RS02
20405	RS02_LotID	A	EFEM Lot ID for RS02
20406	RS02_SlotNo	U2	EFEM Slot No for RS02

2.3 SVID(State Variable ID)

2.3.1 SVID LIST(4)

ID	Name	TYPE	Description
20501	RS03_GlassID	A	Glass ID for RS03
20502	RS03_PPID	A	EFEM PPID for RS03
20503	RS03_PortID	U2	EFEM Port ID for RS03
20504	RS03_CarrierID	A	EFEM Carrier ID for RS03
20505	RS03_LotID	A	EFEM Lot ID for RS03
20506	RS03_SlotNo	U2	EFEM Slot No for RS03
20601	RS04_GlassID	A	Glass ID for RS04
20602	RS04_PPID	A	EFEM PPID for RS04
20603	RS04_PortID	U2	EFEM Port ID for RS04
20604	RS04_CarrierID	A	EFEM Carrier ID for RS04
20605	RS04_LotID	A	EFEM Lot ID for RS04
20606	RS04_SlotNo	U2	EFEM Slot No for RS04
20701	RS05_GlassID	A	Glass ID for RS05
20702	RS05_PPID	A	EFEM PPID for RS05
20703	RS05_PortID	U2	EFEM Port ID for RS05
20704	RS05_CarrierID	A	EFEM Carrier ID for RS05
20705	RS05_LotID	A	EFEM Lot ID for RS05
20706	RS05_SlotNo	U2	EFEM Slot No for RS05
20801	AK01_GlassID	A	Glass ID for AK01
20802	AK01_PPID	A	EFEM PPID for AK01
20803	AK01_PortID	U2	EFEM Port ID for AK01
20804	AK01_CarrierID	A	EFEM Carrier ID for AK01
20805	AK01_LotID	A	EFEM Lot ID for AK01
20806	AK01_SlotNo	U2	EFEM Slot No for AK01

2.3 SVID(State Variable ID)

2.3.1 SVID LIST(5)

ID	Name	TYPE	Description
20901	BF01_GlassID	A	Glass ID for BF01
20902	BF01_PPID	A	EFEM PPID for BF01
20903	BF01_PortID	U2	EFEM Port ID for BF01
20904	BF01_CarrierID	A	EFEM Carrier ID for BF01
20905	BF01_LotID	A	EFEM Lot ID for BF01
20906	BF01_SlotNo	U2	EFEM Slot No for BF01
21001	LF01_GlassID	A	Glass ID for LF01
21002	LF01_PPID	A	EFEM PPID for LF01
21003	LF01_PortID	U2	EFEM Port ID for LF01
21004	LF01_CarrierID	A	EFEM Carrier ID for LF01
21005	LF01_LotID	A	EFEM Lot ID for LF01
21006	LF01_SlotNo	U2	EFEM Slot No for LF01
21101	UCV01_GlassID	A	Glass ID for UCV01
21102	UCV01_PPID	A	EFEM PPID for UCV01
21103	UCV01_PortID	U2	EFEM Port ID for UCV01
21104	UCV01_CarrierID	A	EFEM Carrier ID for UCV01
21105	UCV01_LotID	A	EFEM Lot ID for UCV01
21106	UCV01_SlotNo	U2	EFEM Slot No for UCV01
21201	UCV02_GlassID	A	Glass ID for UCV02
21202	UCV02_PPID	A	EFEM PPID for UCV02
21203	UCV02_PortID	U2	EFEM Port ID for UCV02
21204	UCV02_CarrierID	A	EFEM Carrier ID for UCV02
21205	UCV02_LotID	A	EFEM Lot ID for UCV02
21206	UCV02_SlotNo	U2	EFEM Slot No for UCV02

2.3 SVID(State Variable ID)

2.3.1 SVID LIST(6)

ID	Name	TYPE	Description
21301	UCV03_GlassID	A	Glass ID for UCV03
21302	UCV03_PPID	A	EFEM PPID for UCV03
21303	UCV03_PortID	U2	EFEM Port ID for UCV03
21304	UCV03_CarrierID	A	EFEM Carrier ID for UCV03
21305	UCV03_LotID	A	EFEM Lot ID for UCV03
21306	UCV03_SlotNo	U2	EFEM Slot No for UCV03
21401	UCV04_GlassID	A	Glass ID for UCV04
21402	UCV04_PPID	A	EFEM PPID for UCV04
21403	UCV04_PortID	U2	EFEM Port ID for UCV04
21404	UCV04_CarrierID	A	EFEM Carrier ID for UCV04
21405	UCV04_LotID	A	EFEM Lot ID for UCV04
21406	UCV04_SlotNo	U2	EFEM Slot No for UCV04
21501	UCV05_GlassID	A	Glass ID for UCV05
21502	UCV05_PPID	A	EFEM PPID for UCV05
21503	UCV05_PortID	U2	EFEM Port ID for UCV05
21504	UCV05_CarrierID	A	EFEM Carrier ID for UCV05
21505	UCV05_LotID	A	EFEM Lot ID for UCV05
21506	UCV05_SlotNo	U2	EFEM Slot No for UCV05
21601	OP01_GlassID	A	Glass ID for OP01
21602	OP01_PPID	A	EFEM PPID for OP01
21603	OP01_PortID	U2	EFEM Port ID for OP01
21604	OP01_CarrierID	A	EFEM Carrier ID for OP01
21605	OP01_LotID	A	EFEM Lot ID for OP01
21606	OP01_SlotNo	U2	EFEM Slot No for OP01

2.4 Report of Collection Events

2.4.1 DVID LIST(1)

ID	Name	TYPE	Description
301	ALCD	Bi	Alarm code byte
302	ALID	U4	AlarmID of the most recent alarm to change state.
303	ALTX	A	AlarmText of the most recent alarm to change state
304	ECID	U4	Equipment Constant ID
305	ECNAME	A	Equipment Constant Name
306	ECV	Any	Equipment Constant Value
307	PPChangeName	A	
308	PPChangeStatus	U2	1 = created 2 = edited 3 = deleted
309	PPCurrentSelected	A	Current selected PPID
310	ModuleID	A	Substrate Location ID
311	GlassID	A	Substrate ID
312	PPID	A	EFEM PPID
313	PortID	U2	EFEM PortID
314	CarrierID	A	EFEM CarrierID
315	LotID	A	EFEM LotID
316	SlotNo	U2	EFEM SlotNo
321	ProcessDataList	L	L,n n = # of DCOL 1.<DCOL_Value_1> … n.<DCOL_Value_n> ex) AK01 모듈 (DVID = 43101, 43102, 43103) L, 3 <A [3] "1.1"> <A [3] "2.1"> <A [3] "3.1">

2.4 Report of Collection Events

2.4.1 DVID LIST(2)

ID	Name	TYPE	Description
41101	DEV01_MotorSpeed	A	Motor Speed
41102	DEV01_ProcessingTime	A	Processing time for glass.
41103	DEV01_LiquidTemperature	A	약액 온도
41104	DEV01_LiquidFlowRate	A	약액 유량
41105	DEV01_LiquidConcentration	A	약액 농도
41106	DEV01_AquaNozzlePressureData	A	Aqua Knife 압력 Data
41107	DEV01_UpperNozzlePressureData	A	상부 Nozzle 압력 Data
41108	DEV01_LowerNozzlePressureData	A	하부 Nozzle 압력 Data
41109	DEV01_OutputAirCurtainUpperNozzlePressureData	A	Out A/curtain 상부 Nozzle 압력 Data
41110	DEV01_OutputAirCurtainLowerNozzlePressureData	A	Out A/curtain 하부 Nozzle 압력 Data

2.4 Report of Collection Events

2.4.1 DVID LIST(4)

ID	Name	TYPE	Description
42101	RS01_MotorSpeed	A	Motor Speed
42102	RS01_ProcessingTime	A	Processing time for glass.
42103	RS01_UpperNozzlePressureData	A	Rinse #1 압력 Data 상부 nozzle
42104	RS01_LowerNozzlePressureData	A	Rinse #1 압력 Data 하부 nozzle

2.4 Report of Collection Events

2.4.1 DVID LIST(5)

ID	Name	TYPE	Description
42201	RS02_MotorSpeed	A	Motor Speed
42202	RS02_ProcessingTime	A	Processing time for glass.
42203	RS02_UpperNozzlePressureData	A	Rinse #2 압력 Data 상부 nozzle
42204	RS02_LowerNozzlePressureData	A	Rinse #2 압력 Data 하부 nozzle

2.4 Report of Collection Events

2.4.1 DVID LIST(6)

ID	Name	TYPE	Description
42301	RS03_MotorSpeed	A	Motor Speed
42302	RS03_ProcessingTime	A	Processing time for glass.
42303	RS03_UpperNozzlePressureData	A	Rinse #3 압력 Data 상부 nozzle
42304	RS03_LowerNozzlePressureData	A	Rinse #3 압력 Data 하부 nozzle

2.4 Report of Collection Events

2.4.1 DVID LIST(7)

ID	Name	TYPE	Description
42401	RS04_MotorSpeed	A	Motor Speed
42402	RS04_ProcessingTime	A	Processing time for glass.
42403	RS04_UpperNozzlePressureData	A	Rinse #4 압력 Data 상부 nozzle
42404	RS04_LowerNozzlePressureData	A	Rinse #4 압력 Data 하부 nozzle

2.4 Report of Collection Events

2.4.1 DVID LIST(8)

ID	Name	TYPE	Description
42501	RS05_MotorSpeed	A	Motor Speed
42502	RS05_ProcessingTime	A	Processing time for glass.
42503	RS05_UpperNozzlePressureData	A	Rinse #5 압력 Data 상부 nozzle
42504	RS05_LowerNozzlePressureData	A	Rinse #5 압력 Data 하부 nozzle

2.4 Report of Collection Events

2.4.1 DVID LIST(9)

ID	Name	TYPE	Description
43101	AK01_MotorSpeed	A	Motor Speed
43102	AK01_ProcessingTime	A	Processing time for glass.
43103	AK01_Temperature	A	A/Knife(Hot Air) 온도

2.5 Report of Collection Events

2.5.1 RPTID/CEID/VID List(1)

CEID	RPTID	VID	Contents
1001 1002 1003			**ControlStateOffline**
			ControlStateLocal
			ControlStateRemote
	101	201	ControlState
		202	PreviousControlState
1015			**EquipmentConstantChanged**
	102	304	ECID
		305	ECNAME
		306	ECV
1031 1032			**AlarmDected**
			AlarmCleared
	103	310	ModuleID
		301	ALCD
		302	ALID
		303	ALTX
1051			**EquipmentStateChanged**
	104	203	EqpState
		204	PreviousEqpState
1061			**OperationIDChanged**
	105	205	UserId
		206	PreviousUserId
1071			**PPChanged**
	106	307	PPChangeName
		308	PPChangeStatus
1072			**PPSelected**
	107	309	PPCurrentSelected

2.5 Report of Collection Events

2.5.1 RPTID/CEID/VID List(2)

CEID	RPTID	VID	Contents
1101 1102			**ModuleStart**
			ModuleEnd
	108	310	ModuleID
1201 1202			**SubstrateLocationOccupied**
			SubstrateLocationUnoccupied
	109	310	ModuleID
		311	GlassID
1301 1302 1311 1312			**GlassStart**
			GlassEnd
			GlassStartEach
			GlassEndEach
	110	310	ModuleID
		311	GlassID
		312	PPID
		313	PortID
		314	CarrierID
		315	LotID
		316	SlotNo
1321			**GlassScrap**
	111	310	ModuleID
		311	GlassID
1401			**ProcessData**
	112	310	ModuleID
		311	GlassID
		312	PPID
		313	PortID
		314	CarrierID
		315	LotID
		316	SlotNo
		321	ProcessDataList

3. SECS-II Message Summary

Message	Direction	Description	Note
S*F0	Host ↔ EQ	Abort Transaction	
S1F1	Host ↔ EQ	Are You There Request(R)	
S1F2	Host ↔ EQ	On-Line Data(D)	
S1F3	Host → EQ	Selected equipment status request	
S1F4	Host ← EQ	Selected Equipment status Data	
S1F11	Host → EQ	Status variable name-list request	
S1F12	Host ← EQ	Status Variable name-list reply	
S1F13	Host ↔ EQ	Establish communication request	
S1F14	Host ↔ EQ	Establish communication request Ack	
S1F15	Host → EQ	Request Off-line	
S1F16	Host ← EQ	Request Off-line Acknowledge	
S1F17	Host → EQ	Request On-line	
S1F18	Host ← EQ	Request On-line Acknowledge	
S2F13	Host → EQ	Equipment constant request	
S2F14	Host ← EQ	Equipment constant data	
S2F15	Host → EQ	New equipment constant send	
S2F16	Host ← EQ	New equipment constant Ack	
S2F17	Host ↔ EQ	Date and time request	
S2F18	Host ↔ EQ	Date and time data	
S2F23	Host → EQ	Trace Initialize Send	
S2F24	Host ← EQ	Trace Initialize Acknowledge	
S2F25	Host → EQ	Loop-back diagnostic request	
S2F26	Host ← EQ	Loopback Diagnostic Data	
S2F29	Host → EQ	Equipment constant name-list request	
S2F30	Host ← EQ	Equipment Constant Name-list	
S2F31	Host → EQ	Date and time send	
S2F32	Host ← EQ	Data and Time Set Acknowledge	

3. SECS-II Message Summary

Message	Direction	Description	Note
S2F33	Host → EQ	Define Report	
S2F34	Host ← EQ	Define Report Acknowledge	
S2F35	Host → EQ	Link event report	
S2F36	Host ← EQ	Link event report acknowledge	
S2F37	Host → EQ	Enable/disable event report	
S2F38	Host ← EQ	Enable/disable event report acknowledge	
S2F41	Host → EQ	Host command send	
S2F42	Host ← EQ	Host command acknowledge	
S5F1	Host ← EQ	Alarm report send	
S5F2	Host → EQ	Alarm report send acknowledge	
S5F3	Host → EQ	Enable/disable alarm send	
S5F4	Host ← EQ	Enable/disable alarm acknowledge	
S5F5	Host → EQ	List alarms request	
S5F6	Host ← EQ	List alarms data	
S5F7	Host → EQ	List enabled alarm request	
S5F8	Host ← EQ	List enabled alarm data	
S6F1	Host ← EQ	Trace Data Send	
S6F2	Host → EQ	Trace Data Acknowledge	
S6F11	Host ← EQ	Event report send	
S6F12	Host → EQ	Event report acknowledge	
S7F1	Host ↔ EQ	Process Program Load Inquire	
S7F2	Host ↔ EQ	Process Program Load Grant	
S7F17	Host → EQ	Delete Process Program Send	
S7F18	Host ← EQ	Delete Process Program Acknowledge	
S7F19	Host → EQ	Current EPPD Request	
S7F20	Host ← EQ	Current EPPD Data	

3. SECS-II Message Summary

Message	Direction	Description	Note
S7F23	H ↔ E	Formatted Process Program Send	
S7F24	H ↔ E	Formatted Process Program Acknowledge	
S7F25	H ↔ E	Formatted Process Program Request	
S7F26	H ↔ E	Formatted Process Program Data	
S9F1	Host ← EQ	Unrecognized device ID	
S9F3	Host ← EQ	Unrecognized stream type	
S9F5	Host ← EQ	Unrecognized function type	
S9F7	Host ← EQ	Illegal data	
S9F9	Host ← EQ	Transaction timer timeout	
S9F11	Host ← EQ	Data too long	
S10F3	H → E	Terminal displaysingle	
S10F4	H ← E	Terminal displaysingle acknowledge	

4. SECS Message Stream & Functions

4.1 Operational Concept

4.1.1 Data Format Length

I1 - Integer 1 Byte : From _128 to +127
I2 - Integer 2 Bytes : From _32,768 to +32,768
I4 - Integer 4 Bytes : From _2,157,483,648 to +2,157,483,648
I8 - Integer 8 Bytes : From _9,223,372,036,854,775,808 to +9,223,372,036,854,775,808
U1 - Unsigned 1 Bytes : From 0 to 255
U2 - Unsigned 2 Bytes : From 0 to 65,535
U4 - Unsigned 4 Bytes : From 0 to 4,294,967,295
U8 - Unsigned 8 Bytes : From 0 to 18,446,744,073,709,551,615
F4 - 4-byte floating point : From -3.40282347E+38F to 3.40282347E+38F
F8 - 8-byte floating point : From -1.7976931348623157E+308 to 1.7976931348623157E+308
Boolean : "False" or "True"

A[자릿수] - ASCII : Ex) a~z, A~Z, 0~9, _, space, (,), etc

4. SECS Message Stream & Functions

4.2 STREAM 1

■ S1, F1 Are You There Request (H ↔ E)

Description
Establishes that the SECS-II link is operational and that the host and machine are online. The machine responds with its model number and software revision. The host responds with a null list. The equipment may use this message when using SECS-I as a "heartbeat" to detect communication failures. The equipment also uses this message in the Control State model when attempting to go online
Structure
Header only

■ S1, F2 On-line Data (H ← E)

Structure		
L , 2 1. <A MDLN> 2. <A SOFTREV>		
Dictionary		
MDLN	Equipment ModelType, 6bytes max	Same data as returned by S1, F2
SOFTREV	Software revision code 6 bytes maximum	

■ S1, F2 On-line Data (H → E)

Structure
L , 0

■ S1, F3 Selected Equipment Status Request (H → E)

Structure		
L , n 1. <U4 SVID> … n. <U4 SVID>		
Dictionary		
SVID	Status variable ID	Status variables may include any parameter that can be sampled in time such as temperature or quantity of a consumable.

4. SECS Message Stream & Functions

■ S1, F4 Selected Equipment Status Data(H ← E)

Structure		
L , n 1. <* SV> n. <* SV>		
Note		
A zero-length U1 for SV means that the SVID does not exist.		
Dictionary		
SV	Status variable value	

■ S1, F11 Status Variable Namelist Request ((H → E)

Description		
A request from the host to the machine to report the name and units of certain status variables, in the order requested.		
Structure		
L , n 1. <U4 SVID> … n. <U4 SVID>		
Dictionary		
SVID	Status variable ID	Status variables may include any parameter that can be sampled in time such as temperature or quantity of a consumable.

4. SECS Message Stream & Functions

■ S1, F12 Status Variable Namelist Reply(H ← E)

Structure		
L , n 1. L , 3 1. <U4 SVID> 2. <A SVNAME> 3. <A UNITS> … n. L , 3 1. <U4 SVID> 2. <A SVNAME> 3. <A UNITS>		
Dictionary		
SVID	Status variable ID	Status variables may include any parameter that can be sampled in time such as temperature or quantity of a consumable.
SVNAME	Status Variable Name	
UNITS	Units Identifier	As allowed by SEMI E5 Section 12.

■ S1, F13 Establish Communications Request(H ↔ E)

Structure
L , 0

■ S1, F14 Establish Communications Request Acknowledge(H ↔ E)

Structure		
L , 2 1. <Bi COMMACK> 2. L , 0		
Dictionary		
COMMACK	Establish Communications Acknowledge Code, 1 byte	0 = Accepted 1 = Denied, Try Again 2-63 Reserved

4. SECS Message Stream & Functions

■ S1, F13 Establish Communications Request(H ↔ E)

Description		
Initiate an attempt to establish a SECS-II communications link at a logical level on power-up or after a break in the link. It is the first message sent after either of the above conditions. If no response is received from the host, the machine will periodically send a S1F13 message until a S1F14 with the correct COMMACK is received.		
Structure		
L , 2 1. <A MDLN> 2. <A SOFTREV>		
Dictionary		
MDLN	Equipment ModelType, 6bytes max	Same data as returned by S1, F2
SOFTREV	Software revision code 6 bytes maximum	

■ S1, F14 Establish Communications Request Acknowledge(H ↔ E)

Structure		
L , 2 1. <Bi COMMACK> 2. L , 2 1. <A MDLN> 2. <A SOFTREV>		
Dictionary		
COMMACK	Establish Communications Acknowledge Code, 1 byte	0 = Accepted 1 = Denied, Try Again 2-63 Reserved
MDLN	Equipment ModelType, 6bytes max	Same data as returned by S1, F2
SOFTREV	Software revision code 6 bytes maximum	

4. SECS Message Stream & Functions

■ S1, F15 Off-line Control State Request(H → E)

Description
The host requests that the equipment transition to the OFF-LINE state.
Structure
Header only

■ S1, F16 Off-line Control State Acknowledge(H ← E)

Structure		
1. <Bi OFLACK>		
Dictionary		
COMMACK	Establish Communications Acknowledge Code, 1 byte	0 = Accepted 1 = Denied, Try Again 2-63 Reserved

■ S1, F17 On-line Control State Request(H → E)

Description
The host requests that the equipment transition to the ON-LINE state.
Structure
Header only

■ S1, F18 On-line Control State Acknowledge(H ← E)

Structure		
1. <Bi OFLACK>		
Dictionary		
COMMACK	Establish Communications Acknowledge Code, 1 byte	0 = Accepted 1 = Denied, Try Again 2-63 Reserved

4. SECS Message Stream & Functions

4.3 STREAM 2

■ S2, F13 Equipment Constant Request (H → E)

Description		
A request from the host to report the value of certain equipment constants in a predefined order.		
Structure		
L , N 1. <U4 ECID> … n. <U4 ECID>		
Dictionary		
ECID	Equipment Constant ID	

■ S2, F14 Equipment Constant Data(H ← E)

Structure		
L , N 1. <* ECV> … n. <* ECV>		
Dictionary		
ECV	Equipment Constant Value	

■ S2, F15 New Equipment Constant Send (H → E)

Description		
Host updates the values of specified EC. If the host returns a non-zero EAC the equipment will not change the value of any ECID specified in the S2F15 body.		
Structure		
L , n 2. L , 2 <U4 ECID> <* ECV> … n. L , 2 <U4 ECID> <* ECV>		
Dictionary		
ECID	Equipment Constant ID	
ECV	Equipment Constant Value	

4. SECS Message Stream & Functions

■ S2, F16 New Equipment Constant Acknowledge (H ← E)

Structure		
<Bi EAC>		
Dictionary		
EAC	Equipment acknowledge code, 1 byte	0 = Acknowledge 1 = Denied. At least one constant does not exist 2 = Denied. Busy 3 = Denied. At least one constant out of range >3 = Other equipment-specific error 4-63 Reserved

■ S2, F17 Date and Time Request (H ↔ E)

Description
The host requests that the equipment transition to the OFF-LINE state.
Structure
Header only

■ S2, F18 Date and Time Data (H ↔ E)

Structure		
<A TIME>		
Note		
A zero-length item means no time exists.		
Dictionary		
TIME	Time of day, 12 or 16 bytes NOTE 4: The 16-byte format is currently optional. After January 1, 1998, the 16-byte format shall be required on new and updated implementations. Support for the 12-byte format shall be supported as a configurable option using the equipment constant TimeFormat. This is a format requirement only and does not imply either precision or accuracy.	If 12 bytes the format is YYMMDDhhmmss YY = Year 00 to 99 MM = Month 01 to 12 DD = Day 01 to 31 hh = Hour 00 to 23 mm = Minute 00 to 59 ss = Second 00 to 59 If 16 bytes the format is YYYYMMDDhhmmsscc YYYY = Year 0000 to 9999 MM = Month 01 to 12 DD = Day 01 to 31 hh = Hour 00 to 23 mm = Minute 00 to 59 ss = Second 00 to 59 cc = Centisecond 00 to 99

4. SECS Message Stream & Functions

■ S2, F23 Trace Initialize Send (H → E)

Description		
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.		
Structure		
L , 5 1. <U4 TRID> 2. <A DSPER> 3. <U4 TOTSMP> 4. <U4 REPGSZ> 5. L , N 1. <U4 SVID> … 1. <U4 SVID>		
Dictionary		
TRID	Trace request ID	
DSPER	Data sample period. DSPER has two allowable formats:	Format 1: hhmmss, 6 bytes Format 2: hhmmsscc, 8 bytes Where “hh” is hours, “mm” is minutes, “ss” is seconds’ and “cc” is centiseconds. Equipment shall either (1) support only Format 1, or (2) support both Format 1 and Format 2. Equipment shall document which formats it accepts. Equipment which supports Format 2 need not necessarily support a minimum DSPER of 1 centisecond, nor a trace resolution of 1 centisecond, but equipment suppliers shall document its trace performance limits.
TOTSMP	Total samples to be made	
REPGSZ	Reporting group size	
SVID	Status variable ID	Status variables may include any parameter that can be sampled in time such as temperature or quantity of a consumable.

■ S2, F24 Trace Initialize Acknowledge (H ← E)

Structure		
<Bi TIAACK>		
Dictionary		
TIAACK	Equipment acknowledgement code, 1 byte	0 = Everything correct 1 = Too many SVIDs 2 = No more traces allowed 3 = Invalid period >3 = Equipment-specified error 4-63 Reserved

4. SECS Message Stream & Functions

■ S2, F25 Loop-back Diagnostic Request (H ↔ E)

Description		
A diagnostic message for checkout of protocol and communication circuits. The message sent is echoed back.		
Structure		
<* ABS>		
Dictionary		
ABS	Any binary string	

■ S2, F26 Loop-back Diagnostic Data (H ↔ E)

Structure		
<** ABS>		
Dictionary		
ABS	Any binary string	

■ S2, F29 Equipment Constant Name list Request (H → E)

Description		
A request from the host to the equipment to retrieve information regarding the specified equipment constants. A zero length list (n = 0) means to send information for all ECID.		
Structure		
L , n 1. <U4 ECID> … n. <U4 ECID>		
Dictionary		
ECID	Equipment Constant ID	

4. SECS Message Stream & Functions

■ S2, F30 Equipment Constant Name list (H ← E)

Structure

L , n
1. L , 6
   1. <U4 ECID>
   2. <A ECNAME>
   3. <* ECMIN>
   4. <* ECMAX>
   5. <* ECDEF>
   6. <A UNITS>

…

n. L , 6
   1. <U4 ECID>
   2. <A ECNAME>
   3. <* ECMIN>
   4. <* ECMAX>
   5. <* ECDEF>
   6. <A UNITS>

Note

Zero length ASCII items for ECNAME, ECMIN, ECMAX, ECDEF and UNITS indicates that the ECID does not exist.

Dictionary

ECID	Equipment Constant ID	
ECNAME	Equipment constant name	
ECMIN	Equipment constant minimum value	
ECMAX	Equipment constant maximum value	
ECDEF	Equipment constant default value	
UNITS	Units Identifier	As allowed by SEMI E5 Section 12.

4. SECS Message Stream & Functions

■ S2, F31 Date and Time Set Request (H → E)

Description		
The host instructs the equipment to set its time base to the specified value.		
Structure		
<A TIME>		
Dictionary		
TIME	Time of day, 12 or 16 bytes NOTE 4: The 16-byte format is currently optional. After January 1, 1998, the 16-byte format shall be required on new and updated implementations. Support for the 12-byte format shall be supported as a configurable option using the equipment constant TimeFormat. This is a format requirement only and does not imply either precision or accuracy.	If 12 bytes the format is YYMMDDhhmmss YY = Year 00 to 99 MM = Month 01 to 12 DD = Day 01 to 31 hh = Hour 00 to 23 mm = Minute 00 to 59 ss = Second 00 to 59 If 16 bytes the format is YYYYMMDDhhmmsscc YYYY = Year 0000 to 9999 MM = Month 01 to 12 DD = Day 01 to 31 hh = Hour 00 to 23 mm = Minute 00 to 59 ss = Second 00 to 59 cc = Centisecond 00 to 99

■ S2,F32 Date and Time Set Acknowledge (H ← E)

Structure		
<Bi TIACK>		
Dictionary		
TIAACK	Equipment acknowledgement code, 1 byte	0 = Everything correct 1 = Too many SVIDs 2 = No more traces allowed 3 = Invalid period >3 = Equipment-specified error 4-63 Reserved

4. SECS Message Stream & Functions

■ S2, F33 Define Report (H → E)

Structure

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

Note

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

Dictionary

DATAID	Data ID	
RPTID	Report ID	
VID	Variable ID	

■ S2, F34 Define Report Acknowledge (H ← E)

Structure

<Bi DRACK>

Dictionary

DRACK	Define Report Acknowledge Code, 1 byte	0 = Accept 1 = Denied. Insufficient space 2 = Denied. Invalid format 3 = Denied. At least one RPTID already defined 4 = Denied. At least VID does not exist >4 = Other errors 5-63 Reserved

4. SECS Message Stream & Functions

■ S2, F35 Link Event Report (H → E)

Description
The host links Report IDs (RPTID) to Collection event IDs (CEID). These linked event reports default to "disabled" upon linking. That is, the occurrence of an event would not cause the report to be sent until enabled. See S2, F37 for enabling events.
Structure
L , 2 1. <U4 DATAID> 2. L , a 1. L , 2 1. <U4 CEID> 2. L , b 1. <U4 RPTID> … b. <U4 RPTID> … a. L , 2 1. <U4 CEID> 2. L , c 1. <U4 RPTID> … c. <U4 RPTID>
Note
A zero-length list following CEID deletes all report links to that event.
Dictionary

DATAID	Data ID	
CEID	Collected event ID	
RPTID	Report ID	

■ S2, F36 Link Event Report Acknowledge (H ← E)

Structure		
<Bi DRACK>		
Dictionary		
DRACK	Define Report Acknowledge Code, 1 byte	0 = Accept 1 = Denied. Insufficient space 2 = Denied. Invalid format 3 = Denied. At least one RPTID already defined 4 = Denied. At least VID does not exist >4 = Other errors 5-63 Reserved

4. SECS Message Stream & Functions

■ S2, F37 Enable/Disable Event Report (H → E)

Description		
Host requests to enable or disable reporting for a list of Collection events (CEID).		
Structure		
L , 2 1. <Bo CEED> 2. L , n 1. <U4 CEID> … n. <U4 CEID>		
Note		
A zero-length list (n = 0) means all CEID.		
Dictionary		
CEED	Collection event or trace enable/disable code, 1 byte	FALSE = Disable TRUE = Enable
CEID	Collected event ID	

■ S2, F38 Enable/Disable Event Report Acknowledge (H ← E)

Structure		
<Bi ERACK>		
Dictionary		
ERACK	Enable/Disable Event Report Acknowledge Code, 1 byte	0 = Accepted 1 = Denied. At least one CEID does not exist >1 = Other Errors 2-63 Reserved

4. SECS Message Stream & Functions

■ S2, F41 Host Command Send(H → E)

Description		
The host sends a request to the equipment to perform the specified command with the relevant parameters.		
Structure		
L 2 1. <A RCMD> 2. L , 1 1. L , 2 1. <A CPNAME> 2. <A CPVAL>		
Dictionary		
RCMD	Remote command code or string	
CPNAME	Parameter name	
CPVAL	Command Parameter Value.	

4. SECS Message Stream & Functions

■ S2, F42 Host Command Acknowledge (H ← E)

Structure		
L , 2 1. <Bi HCACK> 2. L , n 1. L , 2 1. <A CPNAME> 2. <* CEPACK> … n. L , 2 1. <A CPNAME> 2. <* CEPACK>		
Dictionary		
HCACK	Host Command Parameter Acknowledge Code, 1 byte	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 by an event 5 = Rejected, Already in Desired Condition 6 = No such object exists 7-63 Reserved
CPNAME	Recipe name	
CEPACK	Command Enhanced Parameter cknowledge. If a specific value of CPNAME is defined to have a CEPVAL that is a LIST, then CEPACK shall have the same structure as the corresponding list format of CEPVAL as used in S2,F49. Otherwise CEPACK will be a 1 byte integer. Enumerated:	0 = No error 1 = Parameter name (CPNAME) does not exist 2 = Illegal value specified for CEPVAL 3 = Illegal format specified for CEPVAL 4 = Parameter name (CPNAME) not valid as used 5-63 Reserved

4. SECS Message Stream & Functions

4.4 STREAM 5

■ S5, F1 Alarm Report Send (H ← E)

Description		
This message is sent whenever an alarm changes states to "Set" or "Clear"		
Structure		
L , 3 1. <Bi ALCD> 2. <U4 ALID> 3. <A ALTX>		
Dictionary		
ALCD	Alarm code byte	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
ALID	Alarm identification	
ALTX	Alarm text limited to 40 characters	

■ S5, F2 Alarm Report Acknowledge (H → E)

Structure		
<Bi ACKC5>		
Dictionary		
ACKC5	Acknowledge code, 1 byte	0 = Accepted >0 = Error, not accepted 1-63 Reserved

4. SECS Message Stream & Functions

■ S5, F3 Enable/Disable Alarm Send (H → E)

Description		
This message enables or disables an alarm from being reported to the host. Some alarms (safety related) are not controllable in this way.		
Structure		
L , 2 1. <Bi ALED> 2. <U4 ALID>		
Dictionary		
ALED	Alarm enable/disable code, 1 byte	bit 8 = 1 means enable alarm bit 8 = 0 means disable alarm
ALID	Alarm identification	

■ S5, F4 Enable/Disable Alarm Acknowledge (H ← E)

Structure		
<Bi ACKC5>		
Dictionary		
ACKC5	Acknowledge code, 1 byte	0 = Accepted >0 = Error, not accepted 1-63 Reserved

4. SECS Message Stream & Functions

■ S5, F5 List Alarms Request (H → E)

Description		
The host requests the equipment to send information on currently defined alarms.		
Structure		
<U4 ALID1, . . ., ALIDn>		
Note		
A zero-length item (n = 0) means send all possible alarms regardless of the state of ALED.		
Dictionary		
ALID	Alarm identification	

■ S5, F6 List Alarms Data (H ← E)

Structure		
L , m 1. L , 3 1. <Bi ALCD> 2. <U4 ALID> 3. <A ALTX> … m. L , 3 1. <Bi ALCD> 2. <U4 ALID> 3. <A ALTX>		
Note		
If m = 0, no response can be made. A zero-length item returned for ALCD or ALTX means that value does not exist.		
Dictionary		
ALCD	Alarm code byte	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
ALID	Alarm identification	
ALTX	Alarm text limited to 40 characters	

4. SECS Message Stream & Functions

■ S5, F7 List Alarms Request (H → E)

Description
List alarms which are enabled.
Structure
Header only

■ S5, F8 List Alarms Data (H ← E)

Structure
L , m 1. L , 3 1. <Bi ALCD> 2. <U4 ALID> 3. <A ALTX> … m. L , 3 1. <Bi ALCD> 2. <U4 ALID> 3. <A ALTX>
Note
If m = 0, no response can be made. A zero-length item returned for ALCD or ALTX means that value does not exist.
Dictionary

ALCD	Alarm code byte	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
ALID	Alarm identification	
ALTX	Alarm text limited to 40 characters	

4. SECS Message Stream & Functions

4.5 STREAM 6

■ S6, F1 Trace Data Send (H ← E)

Description		
Trace Samples configured with S2, F23 messages are sent to the host in these messages.		
Structure		
L , 4 1. <U4 TRID> 2. <U4 SMPLN> 3. <A STIME> L, n 1. <* SV> … n. <* SV>		
Dictionary		
TRID	Trace request ID	
SMPLN	Sample number	
STIME	Sample time, 12 or 16 bytes. NOTE 3: The 16-byte format is currently optional. After January 1, 1998, the 16-byte format shall be required on new and updated implementations. Support for the 12-byte format shall be supported as a onfigurable option using the equipment constant TimeFormat. This is a format requirement only and does not imply either precision or accuracy.	If 12 bytes the format is YYMMDDhhmmss YY = Year 00 to 99 MM = Month 01 to 12 DD = Day 01 to 31 hh = Hour 00 to 23 mm = Minute 00 to 59 ss = Second 00 to 59 If 16 bytes the format is YYYYMMDDhhmmsscc YYYY = Year 0000 to 9999 MM = Month 01 to 12 DD = Day 01 to 31 hh = Hour 00 to 23 mm = Minute 00 to 59 ss = Second 00 to 59 cc = Centisecond 00 to 99
SV	Status variable value	

■ S6, F2 Trace Data Acknowledge (H → E)

Structure		
<Bi ACKC6>		
Dictionary		
ACKC6	Acknowledge code, 1 byte	0 = Accepted >0 = Error, not accepted 1-63 Reserved

4. SECS Message Stream & Functions

■ S6, F11 Event Report Send (H ← E)

Description
The machine sends a defined, event linked and enabled group of reports to the host on a linked event. This is a message that possibly requires a preceding S6, F5/F6 multiblock enquire/grant transaction.
Structure
L , 3 1. <U4 DATAID> 2. <U4 CEID> 3. L , a 1. L , 2 1. <U4 RPTID> 2. L , b 1. <*V> … b. <*V> … a. L , 2 1. <U4 RPTID> 2. L , c 1. <*V> … c. <*V>
Note
If there are no reports linked to the event a "null" report is assumed. A zero-length list for # of reports (a = 0) means there are no reports linked to the given CEID.

Dictionary		
DATAID	Data ID	
CEID	Collected event ID	
RPTID	Report ID	
V	Variable data	

■ S6, F12 Event Report Acknowledge (H → E)

Structure		
<Bi ACKC6>		
Dictionary		
ACKC6	Acknowledge code, 1 byte	0 = Accepted >0 = Error, not accepted 1-63 Reserved

4. SECS Message Stream & Functions

4.6 STREAM 7

■ S7, F1 Process Program Load Inquire (H ↔ E)

Description		
This message is used to initiate the transfer of a process program or to select from stored programs.		
Structure		
L,2 1. <PPID> 2. <LENGTH>		
Dictionary		
PPID	Process program ID	Limited to a maximum of 80 bytes.
LENGTH	Length of the service program or process program in bytes	

■ S7, F2 Process Program Load Grant (H ↔ E)

Structure		
<PPGNT>		
Dictionary		
PPGNT	Process program grant status, 1 byte	0 = OK 1 = Already have 2 = No space 3 = Invalid PPID 4 = Busy, try later 5 = Will not accept >5 = Other error 6-63 Reserved

■ S7, F17 Delete Process Program Send (H → E)

Description		
This message is used by the host to request the equipment to delete process programs from equipment storage.		
Structure		
L,n (Number of process programs to be deleted) 1. <PPID1> . . n. <PPIDn>		
Note		
If n = 0, then delete all.		
Dictionary		
PPID	Process program ID	Limited to a maximum of 80 bytes.

4. SECS Message Stream & Functions

■ S7, F18 Delete Process Program Acknowledge (H ← E)

Structure		
<ACKC7>		
Dictionary		
ACKC7	Acknowledge code, 1 byte	0 = Accepted 1 = Permission not granted 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

■ S7, F19 Current EPPD Request (H → E)

Description
This message is used to request the transmission of the current equipment process program directory (EPPD). This is a list of all the PPIDs of the process programs stored in the equipment.
Structure
Header only

■ S7, F20 Current EPPD Data (H ← E)

Description		
This message is used to transmit the current EPPD.		
Structure		
L,n (number of process programs in the directory) 1. <PPID1> . . n. <PPIDn>		
Note		
Dictionary		
PPID	Process program ID	Limited to a maximum of 80 bytes.

4. SECS Message Stream & Functions

■ S7, F23 Formatted Process Program Send (H ↔ E)

Description
This message allows movement of formatted process programs between a piece of equipment and its host system.
Structure
L,5 1. <PPID> 2. <MDLN> 3. <SOFTREV> 4. L,c (c = Number of Process Commands) 1. L,2 1. <CCODE> 2. L,p (p = Number of Parameters) 1. <PPARM1> . . p. <PPARMp> 2. L,2 . . c. L,2
Note

Dictionary		
PPID	Process program ID	Limited to a maximum of 80 bytes.
MDLN	Equipment Model Type, 6 bytes max	Same data as returned by S1,F2
SOFTREV	Software revision code 6 bytes maximum	
CCODE	Command Code	
	Process Parameter	Numeric or Boolean SECS data item, single or multiple value, or text string which provides information required to complete the process command to which the parameter refers.

■ S7, F24 Formatted Process Program Acknowledge (H ↔ E)

Structure		
<ACKC7>		
Dictionary		
ACKC7	Acknowledge code, 1 byte	

4. SECS Message Stream & Functions

■ S7, F25 Formatted Process Program Request (H ↔ E)

Description		
This message is used by either equipment or host to request a particular process program from the other.		
Structure		
<PPID>		
Dictionary		
PPID	Process program ID	Limited to a maximum of 80 bytes.

■ S7, F26 Formatted Process Program Data (H ↔ E)

Description		
This message transfers a process program in response to a request for the PPID.		
Structure		
L,4 1. <PPID> 2. <MDLN> 3. <SOFTREV> 4. L,c (c = Number of Process Commands) 1. L,2 1. <CCODE> 2. L,p (p = Number of Parameters) 1. <PPARM1> . . p. <PPARMp> 2. L,2 . . c. L,2		
Note		
A zero length list indicates the request was denied.		
Dictionary		
PPID	Process program ID	Limited to a maximum of 80 bytes.
MDLN	Equipment Model Type, 6 bytes max	Same data as returned by S1,F2
SOFTREV	Software revision code 6 bytes maximum	
CCODE	Command Code	
	Process Parameter	Numeric or Boolean SECS data item, single or multiple value, or text string which provides information required to complete the process command to which the parameter refers.

4. SECS Message Stream & Functions

4.7 STREAM 9

■ S9, F1 Unrecognized Device ID (H ← E)

Description		
Device ID specified in block header is not defined in the machine.		
Structure		
<Bi MHEAD>		
Dictionary		
MHEAD	SECS message block header associated with message block in error	

■ S9, F3 Unrecognized Stream Type (H ← E)

Description		
Machine does not recognize the stream type in the message block header.		
Structure		
<Bi MHEAD>		
Dictionary		
MHEAD	SECS message block header associated with message block in error	

■ S9, F5 Unrecognized Function Type (H ← E)

Description		
Machine does not recognize the stream type in the message block header.		
Structure		
<Bi MHEAD>		
Dictionary		
MHEAD	SECS message block header associated with message block in error	

4. SECS Message Stream & Functions

■ S9, F7 Illegal Data (H ← E)

Description		
This error signifies that the stream and function were correctly interpreted but the associated data was not.		
Structure		
<Bi MHEAD>		
Dictionary		
MHEAD	SECS message block header associated with message block in error	

■ S9, F9 Transaction Timer Timeout (H ← E)

Description		
This error specifies that a transaction / receive timer has timed out and the transaction aborted. The host system should respond to this message in a suitable manner to keep the system operational		
Structure		
<Bi MHEAD>		
Dictionary		
MHEAD	SECS message block header associated with message block in error	

■ S9, F11 Data Too Long (H ← E)

Description		
The machine has been sent more data than it can handle.		
Structure		
<Bi MHEAD>		
Dictionary		
MHEAD	SECS message block header associated with message block in error	

4. SECS Message Stream & Functions

4.8 STREAM 10

■ S10, F3 Terminal Display (Single) (H → E)

Description		
The host requests a text message be displayed on the machine.		
Structure		
L , 2 1. <Bi TID> 2. <A TEXT>		
Dictionary		
TID	Terminal number, 1 byte	0 = Single or main terminal >0 = Additional terminals at the same equipment
TEXT	A single line of characters	

■ S10, F4 Terminal Display (Single) Acknowledge (H ← E)

Structure		
<Bi ACKC10>		
Dictionary		
ACKC10	Acknowledge Code, 1 byte	0 = Accepted for display 1 = Message will not be displayed 2 = Terminal not available 3-63 Reserved

5. SCENARIO

5.1 Message Scenario

■ Host Attempts to Establish Communications

Comment	Host	Equipment	Comment
Establish Communications	S1, F13 →		
			Communications state is enabled (any substate)
		← S1, F14	Reply COMMACK = Accept and Communications state = COMMUNICATING

■ Equipment Attempts To Establish Communications and Host Acknowledges

Comment	Host	Equipment	Comment
			Communications State = NOT COMMUNICATING
		← S1, F13	[LOOP] [LOOP] -- SEND Establish Communications Request
Establish Communications Acknowledge	S1, F14 →		[IF] S1, F14 received without timeouts [THEN] exit loop -- SEND [ELSE] Delay for interval in EstablishCommunications Timeout [ENDIF] [END_LOOP]--SEND [IF] COMMACK = Accept [THEN] Communications state = Communicating exit loop -- [ELSE] Reset timer for delay, and delay for interval specified in EstablishCommunications Timeout [ENDIF] [END_LOOP]

5. SCENARIO

■ Equipment Receives S1, F14 From Host Before Sending S1, F14

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

■ Equipment Sends S1, F14 To Host Before Receiving S1, F14

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

5. SCENARIO

■ Collection Event Reporting Set-up

Comment	Host	Equipment	Comment
Send report definitions	S2, F33 →		DATAIDs, RPTIDs and VIDs received
		← S2, F34	DRACK* = 0 the reports are OK
[ENDIF]			
Link reports to events	S2, F35 →		CEIDs and the corresponding RPTIDs are received
		← S2, F36	LRACK = 0 the event linkages are acceptable.
Enable specific collection events	S2, F37 →		Enable/disable codes (CEEDs) and the respective event reporting CEIDs received.
		← S2, F38	ERACK = 0 OK, will generate the specified reports when the appropriate collection events happen.

5. SCENARIO

■ Request Equipment Status Report

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

■ Request Equipment Status Variable Namelist

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

5. SCENARIO

■ Enable/Disable Alarms

Comment	Host	Equipment	Comment
Enable/Disable Alarm	S5, F3 →		
		← S5, F4	Acknowledge

■ Enable/Disable Alarms

Comment	Host	Equipment	Comment
Request alarm data/text	S5, F5 →		
		← S5, F6	Send alarm data/text

■ Enable/Disable Alarms

Comment	Host	Equipment	Comment
Request enabled alarms	S5, F7 →		
		← S5, F8	Send alarm data/text

■ Send Alarm Report

Comment	Host	Equipment	Comment
		← S5, F1	Send alarm report (if enabled)
Acknowledge	S5, F2 →		
		← S6, F11	Send event report (if enabled)
Acknowledge	S6, F12 →		

5. SCENARIO

■ Host sends a remote command message

Comment	Host	Equipment	Comment
Host Command Send	S2, F41 →		Remote Command Message
		← S2, F42	Host Command Acknowledge
		← S6, F11	[IF] Command Accepted (HCACK = 0 or 4) [THEN] State change or other collection event Occurrence
Event Report Acknowledge	S6, F12 →		

■ Host sends a remote command message

Comment	Host	Equipment	Comment
Host sends equip-ment constants.	S2, F15 →		
		← S2, F16	EAC = 0 equipment sets constants

■ Host Equipment Constants Request

Comment	Host	Equipment	Comment
Host constant request	S2, F13 →		
		← S2, F14	Equipment constant data, see note below

5. SCENARIO

■ Host Equipment Constant Namelist Request

Comment	Host	Equipment	Comment
Host constant namelist request	S2, F29 →		
		← S2, F30	Equipment

■ Operator Changes Equipment Constant

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

■ Material Movement

Comment	Host	Equipment	Comment
			Material is sent or received at an equipment port.
		← S6, F11	Send Collection event to host
Host acknowledges	S6, F12 →		

5. SCENARIO

■ Program Created, Edited or Deleted by Operator

Comment	Host	Equipment	Comment
			New process program created, edited or deleted by operator of equipment. PPChangeName = PPID PPChangeStatus = 1 (Created) = 2 (Edited) = 3 (Deleted)
			[IF] CEID for Process Program Change Event enabled [THEN]
		◄ S6, F11	Send Event Report
Event Report Acknowledges	S6, F12 ►		

■ Process Program Deletion by Host

Comment	Host	Equipment	Comment
Delete Process Program Send	S7, F17 ►		
		◄ S7, F18	The process program is removed from non-volatile storage. Delete Process Program Acknowledge.

■ Process Program Directory Request

Comment	Host	Equipment	Comment
Current EPPD Request	S7, F19 ►		
		◄ S7, F20	Current EPPD Data

5. SCENARIO

■ Host-Initiated Process Program Upload

Comment	Host	Equipment	Comment
Formatted Process Program Request	S7, F25 ►		
		◄ S7, F26	Formatted Process Program Data

■ Equipment-Initiated Process Program Upload

Comment	Host	Equipment	Comment
		◄ S7, F23	Formatted Process Program Send
Formatted Process Program Acknowledge	S7, F24 ►		

■ Host-Initiated Process Program Download

Comment	Host	Equipment	Comment
Process Program Load Inquire	S7, F1 ►		
		◄ S7, F2	Formatted Process Program Load Grant
Formatted Process Program Send	S7, F23 ►		
		◄ S7, F24	Formatted Process Program Acknowledge

■ Equipment-Initiated Process Program Download

Comment	Host	Equipment	Comment
		◄ S7, F25	Formatted Process Program Request
S7,F26 Formatted Process Program Data	S7, F26 ►		

5. SCENARIO

■ Terminal Services

Comment	Host	Equipment	Comment
Host sends textual information to equipment for display to the operator on terminal x.	S10, F3 →		
		← S10, F4	Equipment acknowledges request to display text (equipment sets unrecognized message indicator). Operator indicates message recognition (equipment clears unrecognized message indicator).
		← S6, F11	Message recognition event. (see Event Data Collection for details).
Host acknowledges Optional:	S6, F12 →		

5. SCENARIO

Comment	Host	Equipment	Comment
Host sends textual information to equipment for display to the operator on terminal x.	S10, F3 →		
		← S10, F4	Equipment acknowledges request to display text (equipment sets unrecognized message indicator).
Host sends textual information to equipment for display to the operator on ter-minal x. This message overwrites the first one sent by the host since it is still unrecognized.	S10, F3 →		
		← S10, F4	Equipment acknowledges request to display text (equipment sets unrecognized message indicator).
			Operator indicates message recognition. (Equipment clears unrecognized message indicator).
		← S6, F11	Message recognition event
Host acknowledges	S6, F12 →		

5. SCENARIO

■ Equipment Requests TIME (Optional Scenario)

Comment	Host	Equipment	Comment
		← S2, F17	Equipment requests a time value from the host.
Host responds with a TIME value	S2, F18 →		Equipment sets its internal time reference to the value of TIME received from the host.

■ Host Instructs Equipment to Set Time

Comment	Host	Equipment	Comment
Host instructs equip-ment to set its time.	S2, F31 →		
		← S2, F32	The equipment sets its internal time reference to the value of TIME received from the host and acknowledges completion.

■ Host Requests Equipment's Current Time Value

Comment	Host	Equipment	Comment
Host requests equipment time..	S2, F17 →		
		← S2, F18	Equipment returns its internal time reference value to the host.

5. SCENARIO

■ Host Accepts ON-LINE

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

■ Host Denies ON-LINE

Comment	Host	Equipment	Comment
			Operator actuates ONLINE switch when equipment OFF_LINE state is active.
		← S1, F1	Equipment requests ON-LINE.
Host denies ON-LINE	S1, F0 →		

■ Operator Sets OFF-LINE

Comment	Host	Equipment	Comment
			Operator actuates OFFLINE switch when equipment ON_LINE state is active.
		← S6, F11	"Equipment request OFF-LINE" event.
Acknowledge	S6, F12 →		

5. SCENARIO

■ Operator Sets REMOTE

Comment	Host	Equipment	Comment
		← S6, F11	Operator sets switch from LOCAL to REMOTE. "Control State REMOTE" event..
Acknowledge	S6, F12 →		

■ Operator Sets LOCCAL

Comment	Host	Equipment	Comment
`		← S6, F11	Operator sets switch from REMOTE to LOCAL. "Control State LOCAL" event..
Acknowledge	S6, F12 →		

■ Host Sets OFF-LINE

Comment	Host	Equipment	Comment
Host request OFF-LINE.	S1, F15 →		
			[IF] Equipment is OFF-LINE
		← S1, F0	[THEN] Equipment does not process requests.
			[ELSE] Equipment ON-LINE
		← S1, F16	Equipment acknowledges request and transitions to OFF-LINE.
		← S6, F11	"Equipment OFF-LINE" event.
Acknowledge	S6, F12 →		
			[END_IF]

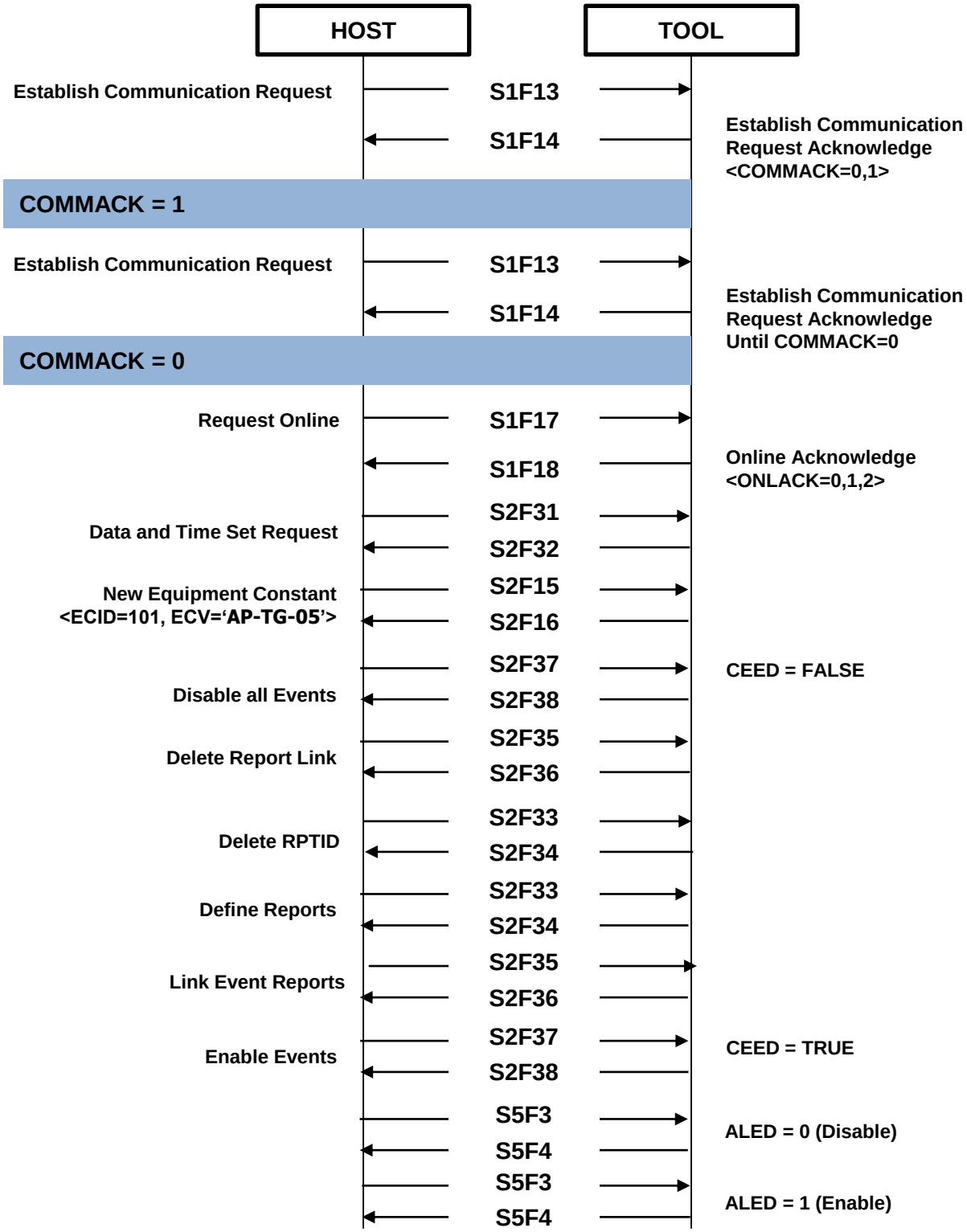
5. SCENARIO

■ Host Sets OFF-LINE

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

5. SCENARIO

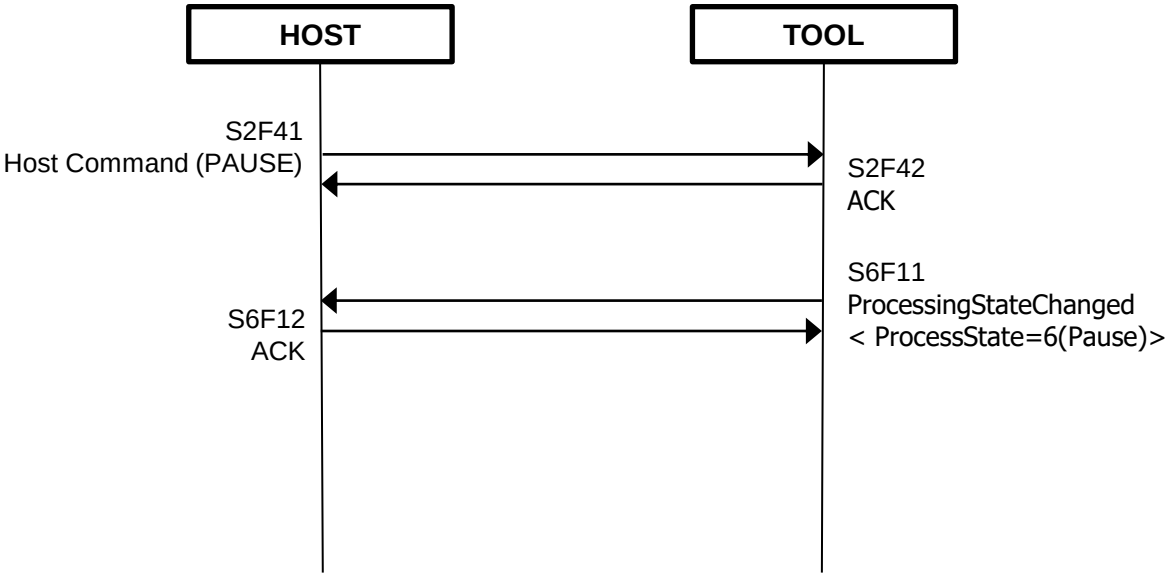
5.2 Connection Establishment Scenario



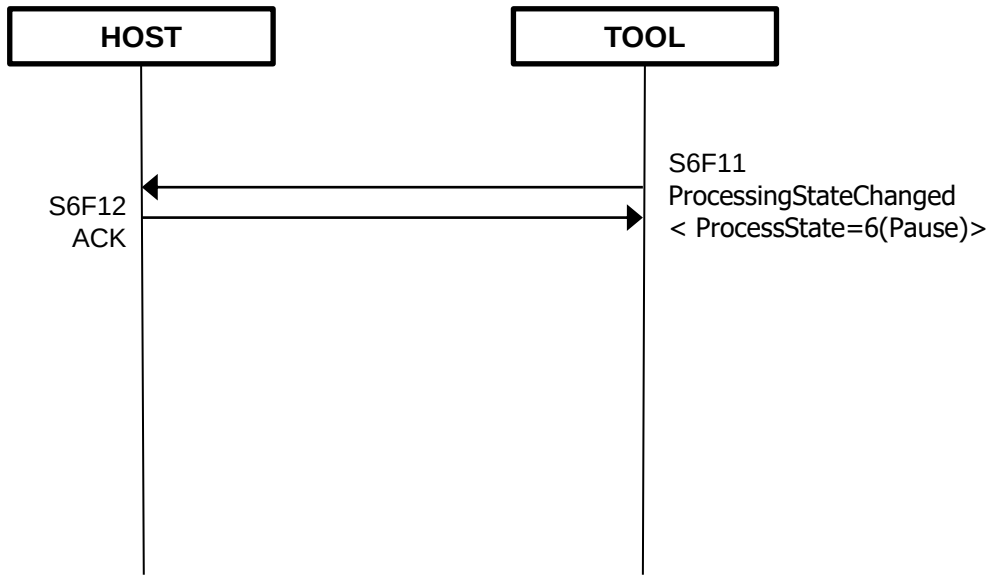
5. SCENARIO

5.3 Remote Command Scenario

■ PAUSE Command (by Host)

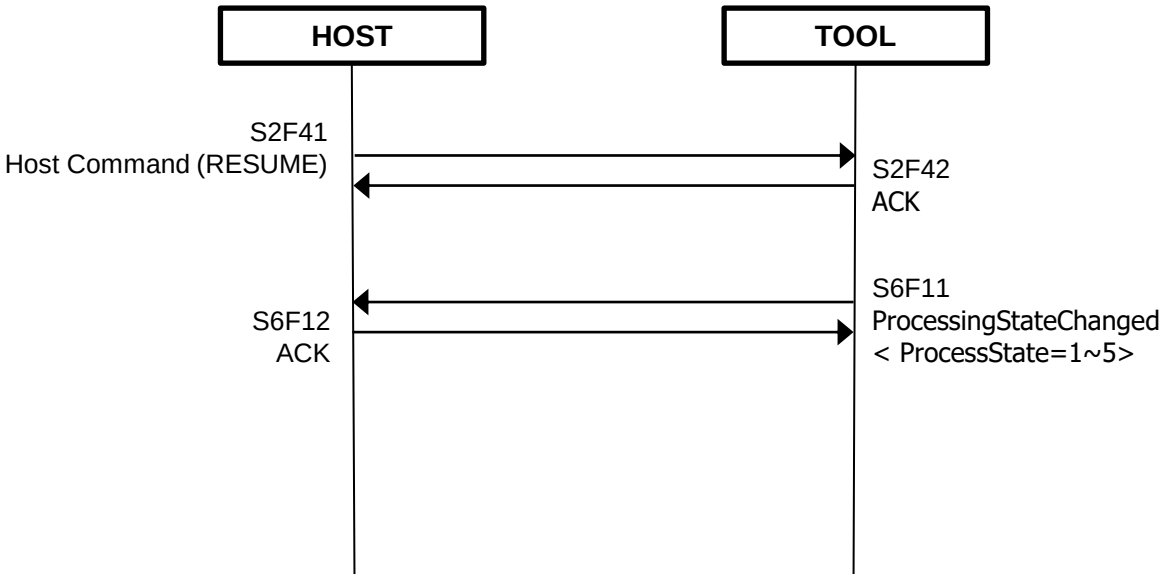


■ PAUSE Command (by Equipment)

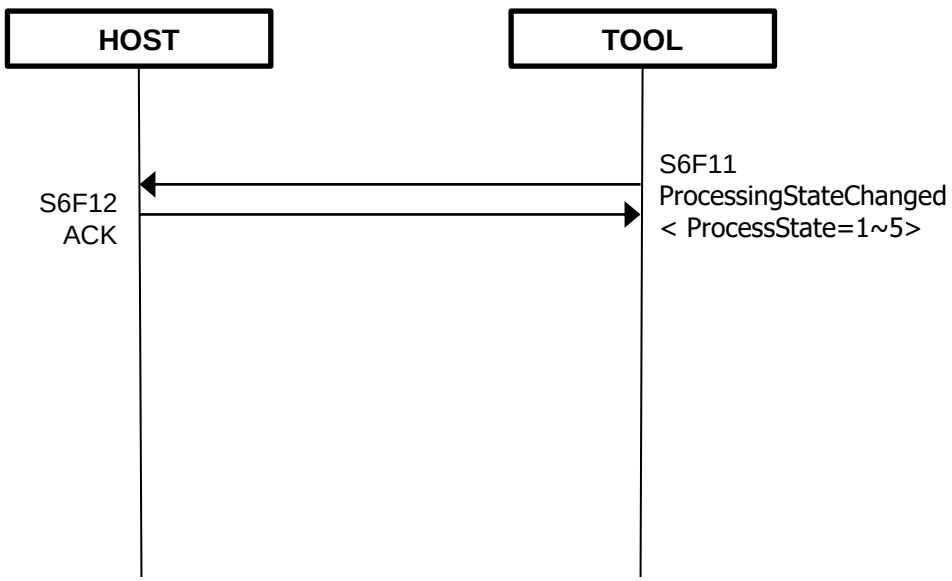


5. SCENARIO

■ **RESUME Command (by Host)**

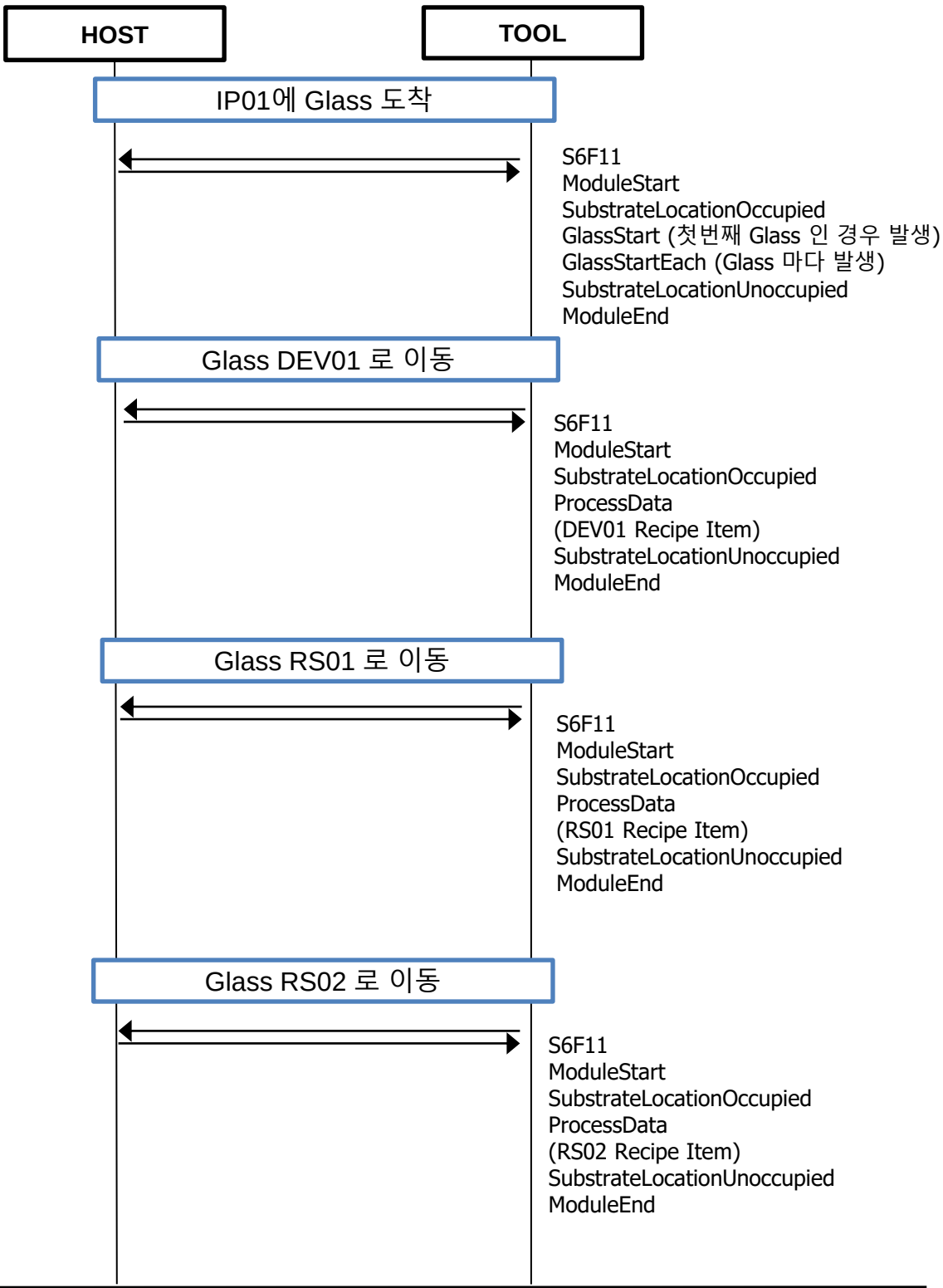


■ **RESUME Command (by Equipment)**

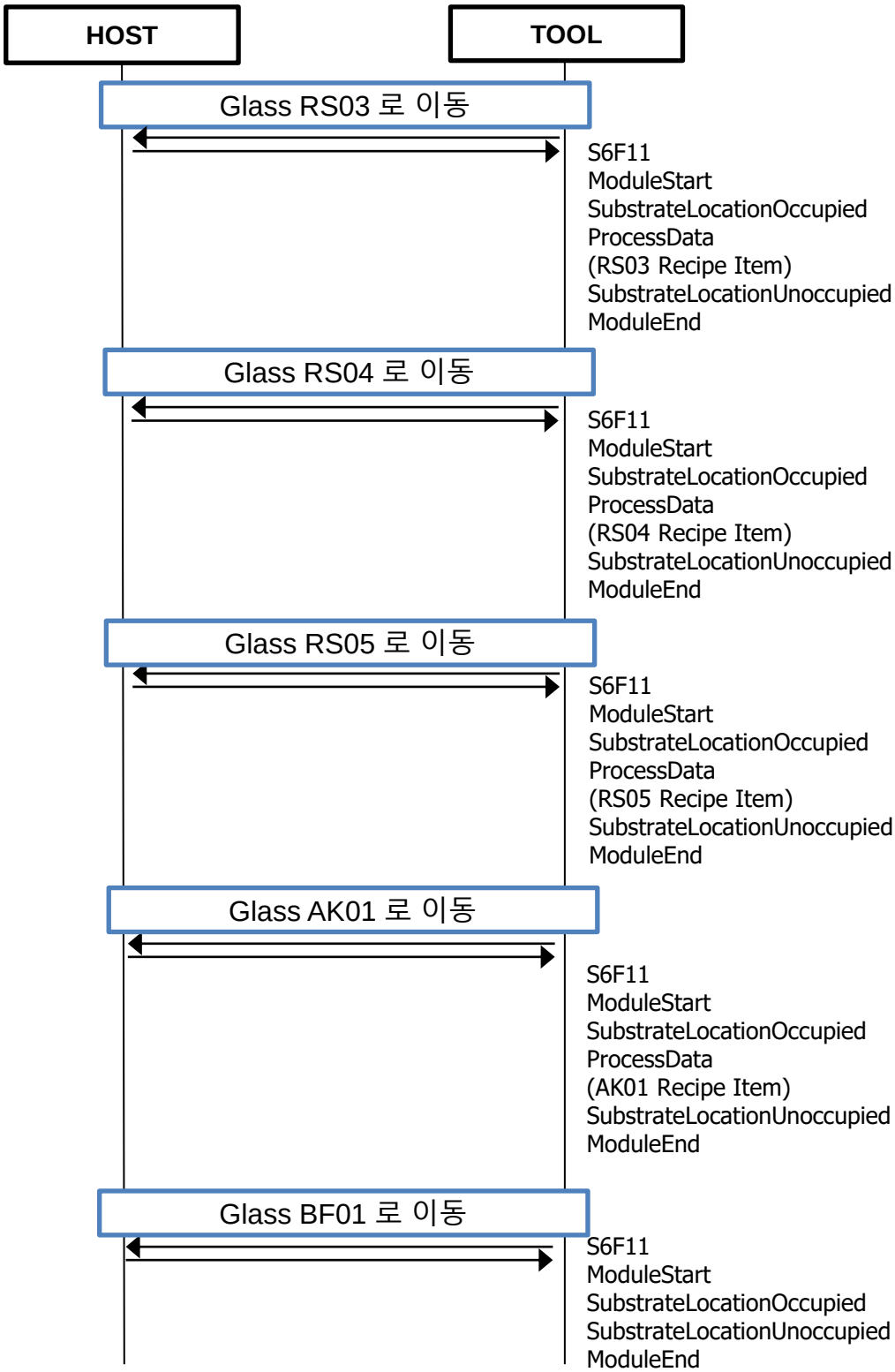


5. SCENARIO

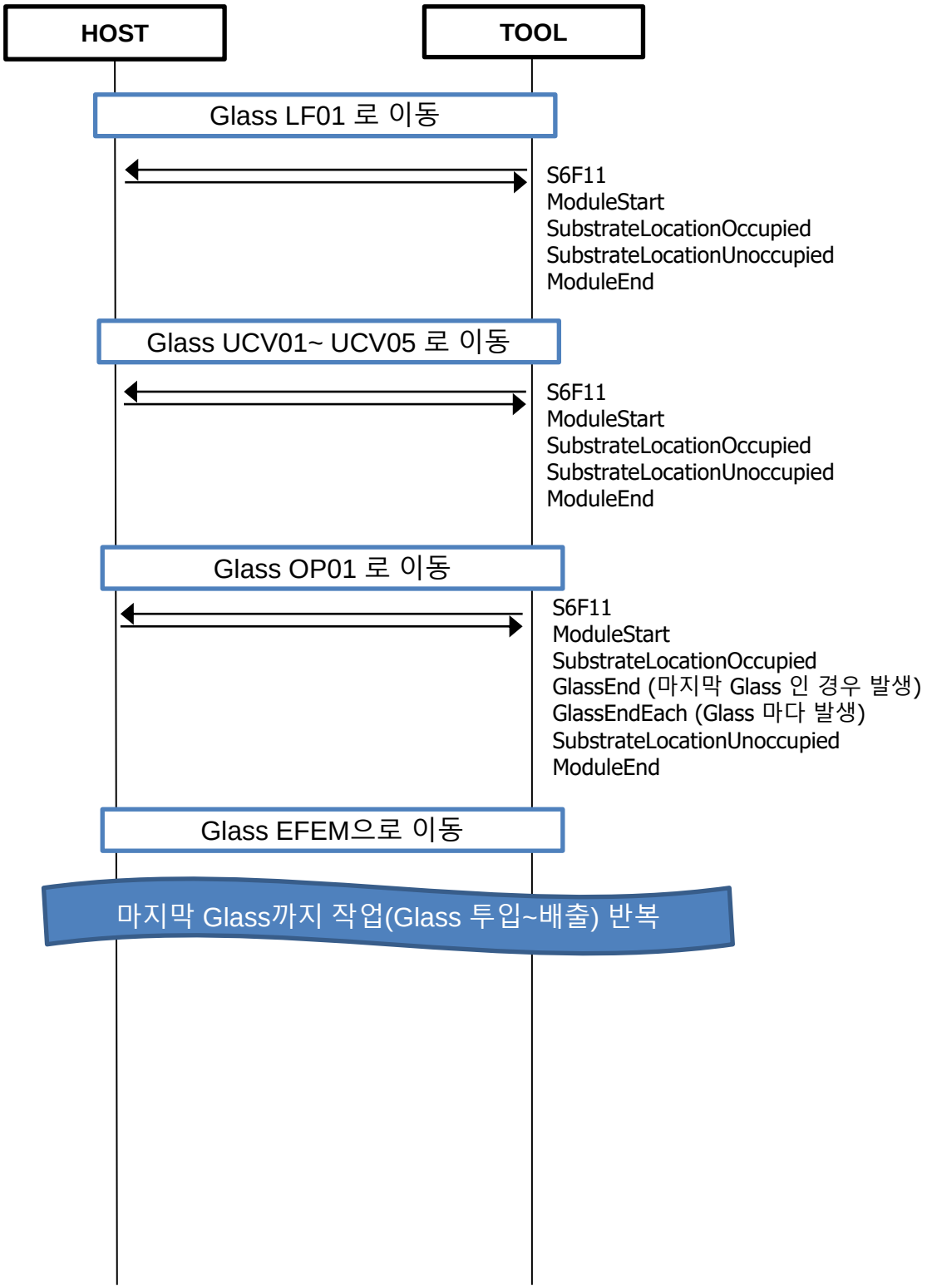
5.5 Normal Scenario



5. SCENARIO


HOST
TOOL
Glass RS03 로 이동
S6F11
ModuleStart
SubstrateLocationOccupied
ProcessData
(RS03 Recipe Item)
SubstrateLocationUnoccupied
ModuleEnd
Glass RS04 로 이동
S6F11
ModuleStart
SubstrateLocationOccupied
ProcessData
(RS04 Recipe Item)
SubstrateLocationUnoccupied
ModuleEnd
Glass RS05 로 이동
S6F11
ModuleStart
SubstrateLocationOccupied
ProcessData
(RS05 Recipe Item)
SubstrateLocationUnoccupied
ModuleEnd
Glass AK01 로 이동
S6F11
ModuleStart
SubstrateLocationOccupied
ProcessData
(AK01 Recipe Item)
SubstrateLocationUnoccupied
ModuleEnd
Glass BF01 로 이동
S6F11
ModuleStart
SubstrateLocationOccupied
SubstrateLocationUnoccupied
ModuleEnd

5. SCENARIO


HOST
TOOL
Glass LF01 로 이동
S6F11
ModuleStart
SubstrateLocationOccupied
SubstrateLocationUnoccupied
ModuleEnd
Glass UCV01~ UCV05 로 이동
S6F11
ModuleStart
SubstrateLocationOccupied
SubstrateLocationUnoccupied
ModuleEnd
Glass OP01 로 이동
S6F11
ModuleStart
SubstrateLocationOccupied
GlassEnd (마지막 Glass 인 경우 발생)
GlassEndEach (Glass 마다 발생)
SubstrateLocationUnoccupied
ModuleEnd
Glass EFEM으로 이동
마지막 Glass까지 작업(Glass 투입~배출) 반복