Cymechs FOUP Opener

Host Communication Manual

Revision Number	Version 1.0.1	Last Update Date	6 / 24 / 2019
Model No	N-DURAPORT	Serial Number	

CYMECHS

Contents

Revision History

Date (mm/dd/yy)	Revision	Descriptions	Changed
04/14/2016	*1.0.0*	New English Manual.	All
03/05/2016	*1.0.1*	Added CFG_CONTROL, INDICATOR_LOAD, INDICATOR_UNLOAD, INDICATOR_AUTO, INDICATOR_MANUAL, INDICATOR_RESERVE, INDICATOR_LBUTTON, INDICATOR_UBUTTON,	

		STATUS_INDICATOR.	
24/06/2019	*1.0.2*	CheckFpType, FOUP check Event	

1. HOST Communication Interfaces

1.1. SUMMARY

The DURAPORT uses COM2 port for host communication through RS-232C asynchronous serial mode; baud-rate, data bit, and parity bit can be enabled using TP. (Refer to [Table 3-1])

But, **stop bit is fixed to 1-bit.**

Item	TP-enabled Data
[Baud rate]	4800, 9600(Default), 19200, 38400
[Parity]	Even/Odd Parity, No Parity(Default)
[Data Bit]	7Bit / 8Bit(Default)

[Table 1−1]   TP-enabled Data

1.2. HOST COMMUNICATION PROTOCOL

Communications between DURAPORT and host can be basically divided into two types: one is ASCII Command mode whose DURAPORT runs only by the commands from host (refer to [Figure 3-2]). However, if DURAPORT state changes due to an external condition, DURAPORT generates and transmits event message to the host (refer to [Figure 3-1]).   In this case, it only transmits the state in ASCII character without receiving its response.
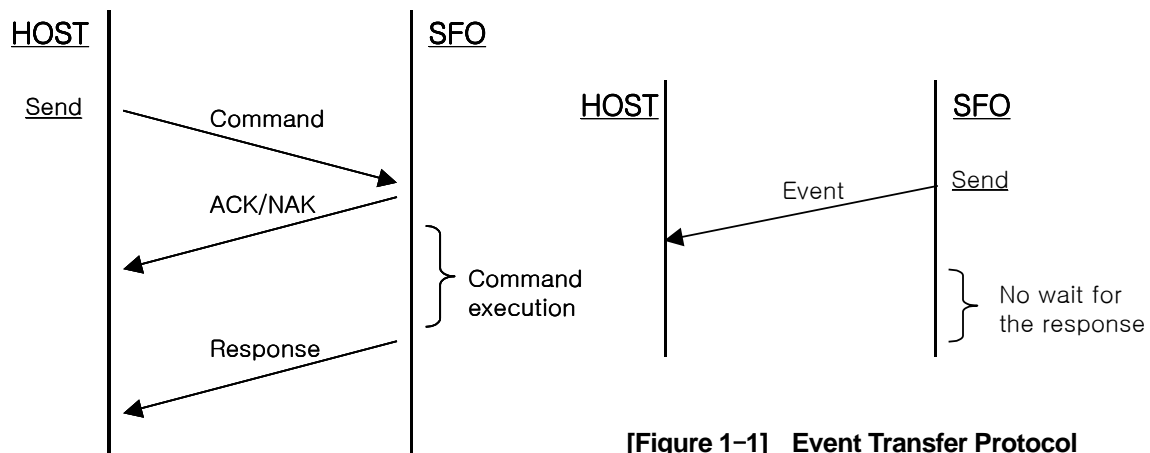
[Figure 1−1]   Event Transfer Protocol

[Figure 1−2]   Standard Transfer Protocol

1.3. COMMANDS

1.3.1. Configuration of Command

The command that is transmitted from Host to DURAPORT consists of execution part and LF.   The execution part is a character string as appointed – refer to 3.3.3. Commands, which is transmitted with line feed (LF: 0x0A) at the end of command.

1.3.2. Acknowledgement to Command

When receiving a command, DURAPORT responds whether or not to receive it correctly.   Which a command is received or not corresponds to ACK ("A\n") and NAK ("N\n") respectively.   The validity of string is not checked.   Shortly, even when improper string is transmitted due to a wrong command or a communication error, DURAPORT receiving LF transmits ACK and the error code to the host.

```
[ACK]     To be transmitted only when a command string and LF have been
          correctly received.
[NAK]     To be transmitted only when an error has been generated in
          receiving a command string.
[Error]   a. To be transmitted if the received command exceeds 200 bytes
          b. To be transmitted if command receiving has started but no data
          transmission during 10 or more seconds before the arrival of LF –
          communication time out.
```

1.3.3. Response

The response to a command received from host means the result after the execution of the command. In case a command has been correctly executed, the response is transmitted to the host in the response form of the command, and in case an error has been generated in command execution, an error code in the form of [Figure 3-3] is transmitted.

Response is traditionally response part and LF.   For the response part to the correctly executed command, refer to 3.3.3. Commands or 3.4. Command Details.   The response to an error while a command has being executed consists of identifier 'E', Error, and LF that are transmitted to the host.

E	×	×	…	\n		0x45	×	×	…	0x0A

[Figure 1−3]   Response transfer protocol

1.4.   TYPE OF COMMANDS

Command	Parameter	Response	Description
AMPON / AMPOFF	*Axis* (0,1,A)	O	All or one axes motor drivers power turn on/off.
AMHS	— ON OFF	ON (OFF) O O	Switch into AMHS mode.
AUTO_MODE	— ON OFF	ON (OFF) O O	Switch into Automatic mode.
CFG_AUTO_CLAMP	— ON OFF	ON (OFF) O O	Check Auto Clamping option or select Enable/Disable.
CFG_AUTO_UNCLAMP	— ON OFF	ON (OFF) O O	Check Auto Unclamping option or select Enable/Disable.
CFG_A1_P0	— *Position Data*	xxxxxxx O	Set up P0 position of the Up/Down axis.
CFG_A1_P1	— *Position Data*	xxxxxxx O	Set up P1 position of the Up/Down axis.
CFG_CONTROL	— ON OFF	ON (OFF) O O	Check CONTROL option or select Enable/Disable.
CFG_DFAC	— *Position Data*	xxxxxxx O	Set up calibration factor for Down mapping.
CFG_IDSW	— ON OFF	ON (OFF) O O	Check Identify switch option or select Enable/Disable.
CFG_MAP	— ON OFF	ON (OFF) O O	Check Mapping option or select Enable/Disable.

CFG_MAPVEL	— *Velocity Data*	xxxxxxx O	Checking & setting the velocity of Mapping.
CFG_PINCH	— ON OFF	ON (OFF) O O	Check Pinch point option or select Enable/Disable.
CFG_PITCH	— *Pitch Data*	xxxxx O	Set up the wafer pitch or confirm the current setting.
CFG_SLOTS	— *Slots Data*	xx O	Set up the total number of slots in cassette or confirm the current setting.
CFG_THRES	— *Threshold Data*	xxxxx O	Set up the wafer thickness for the mapping (Threshold) or confirm the current setting.
CFG_UFAC	— *Position Data*	xxxxxxx O	Set up calibration factor for Up mapping.
CFG_WPOS	— *Position Data*	xxxxxxx O	Set up the first wafer's positon for mapping or confirm the current setting.
CFG_STA_EVENT	— ON OFF	ON (OFF) O O	Check STA_EVENT option or select Enable/Disable.
CFG_RET_CHECK	— ON OFF	ON (OFF) 0 0	Check RET option or select Enable/Disable.
UNLOAD(CLOSE)	—	Mxxxxxxxx,xxxxxxxx,xxxxxxxx	Unload POD
DEVICE_ID	— *ID Data*	xxxxx O	Set up the device ID or confirm the current setting.
DOCK	—	O	Stage move to the docking position.
ECODE	—	Exxx ccc...n(Max. 20)	Get the latest error code and simple discription.
GETMAP	—	Mxxxxxxxx,xxxxxxxx,xxxxxxxx	Get Mapping data.
GETVER	—	VER x.xx	Get controller's firmware vision.
HOM	Axis (1,A)	O	Excute all(auto) or one axes homing.
INDICATOR_LOAD	ON OFF BLINK	O O O	Changes Load Indicator State as ON/OFF/BLINK.

INDICATOR_UNLOAD	ON	O	Changes Unload Indicator State as ON/OFF/BLINK.
	OFF	O	
	BLINK	O	
INDICATOR_AUTO	ON	O	Changes Auto Indicator State as ON/OFF/BLINK.
	OFF	O	
	BLINK	O	
INDICATOR_MANUAL	ON	O	Changes Manual Indicator State as ON/OFF/BLINK.
	OFF	O	
	BLINK	O	
INDICATOR_RESERVE	ON	O	Changes Reserve Indicator State as ON/OFF/BLINK.
	OFF	O	
	BLINK	O	
INDICATOR_LBUTTON	ON	O	Changes Load Button Indicator State as ON/OFF/BLINK.
	OFF	O	
	BLINK	O	
INDICATOR_UBUTTON	ON	O	Changes Unload Button Indicator State as ON/OFF/BLINK.
	OFF	O	
	BLINK	O	
MAINT_MODE	—	ON (OFF)	Switch into Maintence mode or confirm current mode.
	ON	0	
	OFF	0	
MAP_DATA	—	ON (OFF)	
	ON	0	
	OFF	0	
MDOR_LOCK	—	ON (OFF)	Excute Locking/Unlocking the POD door to the POD or confirm current state.
	ON	O	
	OFF	O	
	N		
MDOR_OPN	—	ON (OFF)	Port Door Open/Close or confirm current state
	ON	O	
	OFF	O	
	N		
MLIFT_DN	—	ON (OFF)	Move port door vertically in to P0/P1 position or confirm current state
	ON	O	
	OFF	O	
MPOD_LOCK	—	ON (OFF)	Locking/Unlocking the POD or confirm current state
	ON	O	
	OFF	O	
	N		

MVAC	—	ON (OFF)	Vacuum On/Off or confirm current state
	ON	O	
	OFF	O	
	N		
LOAD(OPEN)	—	Mxxxxxxxx,xxxxxxxx,xxxxxxxx	Open POD
POD_LOCK	—	ON (OFF)	Locking/Unlocking the POD or confirm current state
	ON	O	
	OFF	O	
	N		
RESERVE	—	ON (OFF)	Reserve/Unreserve the load port
	ON	O	
	OFF	O	
RES_B	—	ON (OFF)	Blinking the reserve lamp
	ON	O	
	OFF	O	
RESET	—	O	System reset (Clear all error)
SAVE_ALL	—	O	Save all setting data.
SCAN	UP(DN)	Mxxxxxxxx,xxxxxxxx,xxxxxxxx	Execute mapping.
SEN_PLACE	—	ON (OFF)	Check option of the placement sensor turn On/Off for simulation or confirm current state
	ON	O	
	OFF	O	
SEN_PLOCK	—	ON (OFF)	Check option of the Pod lock sensor turn On/Off for simulation or confirm current state
	ON	O	
	OFF	O	
SEN_VAC	—	ON (OFF)	Check option of the Vacuum sensor turn On/Off for simulation or confirm current state
	ON	O	
	OFF	O	
STATUS	—	Sxxxxxxxx	Get system status
STATUS_INDICATOR	—	Ixxxxxxxx	Get Indicator Status.
TCLOSE	—	O	Close POD Temporaly
TOPEN	—	O	Open POD from Temporaly Closed State
UNDOCK	—	O	Stage move to the undocking position

[Table 1–2]   Type of Commands

1.5.   DESCRIPTION OF A COMMAND

1.5.1. AMPON

[Expression]   "AMPON [*n*]₩n"

[Description] This sets a Motor Driver of designated axis on through a Parameter.

[Parameter]   'No parameter': All axis, '0': X-axis (Not use), '1': Z-axis, 'A': All axis

[Return]   "O₩n"

[Example]   Setting Motor Drivers of all axes on

    <Send>   AMPON₩n

    <Receive> A₩n

    <Receive> O₩n

1.5.2. AMPOFF

[Expression]   "AMPOFF [*n*]₩n"

[Description] This sets a Motor Driver of designated axis off through a Parameter

[Parameter]   'No parameter': All axis, '0': X-axis (Not use), '1': Z-axis, 'A': All axis

[Return]   "O₩n"

[Example]   Setting Motor Drivers of all axes off

    <Send>   AMPOFF A₩n

    <Receive> A₩n

    <Receive> O₩n

1.5.3. AMHS

[Expression]   "AMHS [*ON/OFF*]₩n"

[Description] This sets use of an AMHS (Automated Material Handling System: AGV, RGV and OHT) Mode.

[Parameter]   'No parameter': Return current status,

'ON': AMHS mode Enable, 'OFF': AMHS mode Disable

[Return]   "ON(OFF)₩n", "O₩n"

[Example]   Checking a current status of AMHS Mode and setting it on

   <Send>   AMHS_MODE₩n

   <Receive> A₩n

   <Receive> OFF₩n

   <Send>   AMHS ON₩n

   <Receive> A₩n

   <Receive> O₩n

1.5.4. AUTO_MODE

[Expression]   "AUTO_MODE [*ON/OFF*]₩n"

[Description]   This sets use of an Auto mode or checks a current status..

Auto mode lamp on the front of DURAPORT is on if Auto mode is on. Manual mode lamp on the front of DURAPORT is on if Auto mode is off. (Auto/Manual lamp will be controlled by AUTO_MODE command when CFG_CONTROL is off. If CFG_CONTROL is on, Auto/Manual lamp will be controlled by INDICATOR_AUTO/INDICATOR_MANUAL.)

[Parameter]   'No parameter': Return current status,

'ON': Auto mode Enable, 'OFF': Auto mode Disable

[Return]   "ON(OFF)₩n", "O₩n"

[Example]   Checking a current status of Auto Mode and setting it on

<Send>   AUTO_MODE\n

<Receive> A\n

<Receive> OFF\n

<Send>   AUTO_MODE ON\n

<Receive> A\n

<Receive> O\n

1.5.5. CFG_AUTO_CLAMP

[Expression]   "CFG_AUTO_CLAMP [*ON/OFF*]₩n"

[Description] This checks the setting of whether Clamp works or not or sets use of Clamp. This shall be set ON if Clamp operation is required done compulsorily every time when doing Load and Load operation shall proceeded without Clamp operation when OFF is set.

[Parameter]   'No parameter': Return current status,

'ON': Auto Clamp Enable, 'OFF': Auto Clamp Disable

[Return]   "ON(OFF)₩n", "O₩n"

[Example]   Setting an Auto Clamp function on

<Send>   CFG_AUTO_CLAMP ON₩n

<Receive> A₩n

<Receive> O₩n

1.5.6. CFG_AUTO_UNCLAMP

[Expression]   "CFG_AUTO_UNCLAMP [*ON/OFF*]₩n"

[Description] This checks the setting of whether Unclamp works or not or sets use of Unclamp. This shall be set ON if Unclamp operation is required done compulsorily every time at the last moment of Unload and Unload operation shall be completed without Unclamp operation when OFF is set.

[Parameter]   'No parameter': Return current status,

'ON': Auto Clamp Enable, 'OFF': Auto Clamp Disable

[Return]   "ON(OFF)₩n", "O₩n"

[Example]   Setting an Auto Clamp function om

<Send>   CFG_AUTO_UNCLAMP ON₩n

<Receive> A₩n

<Receive> O₩n

1.5.7. CFG_A1_P0

[Expression]   "CFG_A1_P0 [*n*]₩n"

[Description] This sets P0 position of an Up/Down axis or check a value set in DURAPORT. This performs the same function as P[0] of [MAIN/SET/Loc/1] of TP.

[Parameter]   'No parameter': Return current status,   'xxxxxxx': Position Data

[Return]   "xxxxxxx₩n", "O₩n"

[Example]   Checking P0 position of an Up/Down axis and setting it at 0

<Send>   CFG_A1_P0₩n

<Receive> A₩n

<Receive> 123₩n

<Send>   CFG_A1_P0 0₩n

<Receive> A₩n

<Receive> O₩n

1.5.8. CFG_A1_P1

[Expression]   "CFG_A1_P1 [*n*]₩n"

[Description] This sets P0 position of an Up/Down axis and checks a value set in DURAPORT. This performs the same function as P1 of [MAIN/SET/Loc/1] of TP.

[Parameter]   'No parameter': Return current status,   'xxxxxxx': Position Data

[Return]   "xxxxxxx₩n", "O₩n"

[Example]   Setting P1 position of an Up/Down axis at 385200

   <Send>   CFG_A1_P1 385200₩n

   <Receive> A₩n

   <Receive> O₩n

1.5.9. CFG_CONTROL

[Expression]   "CFG_CONTROL [*ON/OFF*]₩n"

[Description] Check the setting of CFG_CONTROL or sets whether to use.

If CFG_CONTROL is ON, Indicator can be controlled by Host Commands. (INDICATOR_LOAD, INDICATOR_UNLOAD, INDICATOR_AUTO, INDICATOR_MANUAL, INDICATOR_RESERVE, INDICATOR_LBUTTON, INDICATOR_UBUTTON)

Else, Indicator will be controlled as automatically.

[Parameter]   'No parameter': Return current status,

'ON': CFG_ CONTROL Enable, 'OFF' CFG_ CONTROL Disable

[Return]   "ON(OFF)₩n", "O₩n"

[Example]   CFG_ CONTROL feature is set to ON

    <Send>   CFG_CFG_CONTROL ON₩n

    <Receive> A₩n

    <Receive> O₩n

1.5.10.   CFG_DFAC

[Expression]   "CFG_IDSW [*ON/OFF*]₩n"

[Description] This sets a value of Calibration Factor upon Down Mapping. This performs the same function as a [MAIN/SET/POD/ DFac] menu of TP.

[Parameter]   'No parameter': Return current status, 'xxxxxxx': Position Data

[Return]   "xxxxxxx₩n", "O₩n"

[Example]   Setting a Down Calibration Factor at 1200

    <Send>   CFG_DFAC 1200₩n

    <Receive> A₩n

    <Receive> O₩n

1.5.11.   CFG_IDSW

[Expression]   "CFG_IDSW [*ON/OFF*]₩n"

[Description] This checks the setting of Load/Unload Identify Switch Option or sets use of Load/Unload Identify Switch Option.   This performs the same function as a [MAIN/SET/FUNC/ Swch] menu of TP.

[Parameter]   'No parameter': Return current status,

                'ON': Identify Switch Enable, 'OFF': Identify Switch Disable

[Return]   "ON(OFF)₩n", "O₩n"

[Example]   Setting Identify switch Option on

    <Send>   CFG_IDSW ON₩n

<Receive> A₩n

<Receive> O₩n

1.5.12.   CFG_MAP

[Expression]   "CFG_MAP [*ON/OFF*]₩n"

[Description] This checks the setting of Wafer Mapping Option or sets use of Wafer Mapping Option. This performs the same function as [MAIN/SET/FUNC/Map] of TP.

[Parameter]   'No parameter': Return current status,

'ON': Mapping option Enable, 'OFF': Mapping option Disable

[Return]   "ON(OFF)₩n", "O₩n"

[Example]   Checking a setting status of Mapping Option and setting it on

<Send>   CFG_MAP₩n

<Receive> A₩n

<Receive> OFF₩n

<Send>   CFG_MAP ON₩n

<Receive> A₩n

<Receive> O₩n

1.5.13.   CFG_MAPVEL

[Expression]   "CFG_MAPVEL [*n*]₩n"

[Description] This sets a moving speed of an Up/Down axis when performing Wafer Mapping or checks a current set value.

[Parameter]   'No parameter': Return current status,

'xxxxxxx': Velocity Data (Range: 1 ~ 999999, Unit: Pulse/msec)

[Return]   "xxxxxxx₩n", "O₩n"

[Example]   Setting a Mapping Speed at 50000

<Send>   CFG_MAPVEL 50000₩n

<Receive> A₩n

<Receive> O₩n

1.5.14.   CFG_PINCH

[Expression]   "CFG_PINCH [*ON/OFF*]₩n"

[Description]   This checks the setting of Pinch Point Sensor Option or sets use of Pinch Point Sensor Option. In case a Pinch Point Sensor is installed in DURAPORT, the Sensor would not be actually off even if "OFF (Disable)" is set. Simply, it does not check input of a Pinch Point Sensor in the F/W program. DURAPORT is designed so as not to turn the Wafer Protrusion & Pinch Point Sensors off with S/W for system safety and prevention of risks.

[Parameter]   'No parameter': Return current status,

'ON': Pinch point sensor Enable, 'OFF': Pinch point sensor Disable

[Return]   "ON(OFF)₩n", "O₩n"

[Example]   Setting Pinch Point Sensor Option on

<Send>   CFG_PINCH ON₩n

<Receive> A₩n

<Receive> O₩n

[Reference sections]

4.4.7. SETting

1.5.15.   CFG_PITCH

[Expression]   "CFG_PITCH [*n*]₩n

[Description]   This sets the distance between Slots of a Pod or checks the setting.

[Parameter]   'No parameter': Return current status,

'xxxxx': Pitch Data (Range: 1 ~ 99999, Unit: Pulse)

[Return]   "xxxxxx₩n", "O₩n"

[Example]   Setting the distance between Slots of a Pod at 9642

   <Send>   CFG_PITCH 9642₩n

   <Receive> A₩n

   <Receive> O₩n

[Reference sections]

   4.4.7. SETting

1.5.16.   CFG_SLOTS

[Expression]   "CFG_SLOTS [*n*]₩n"

[Description]   This sets the number of Slots in a Pod or checks the setting.

[Parameter]   'No parameter': Return current status, 'xx': Slots Data (Range: 1 ~ 25)

[Return]   "xx₩n", "O₩n"

[Example]   Setting the number of Pod Slots 25

   <Send>   CFG_SLOTS 25

   <Receive> A₩n

   <Receive> O₩n

[Reference sections]

   4.4.7. SETting

1.5.17.   CFG_THRES

[Expression]   "CFG_THRES [*n*]₩n"

[Description]   This checks thickness of the Wafer or checks the setting.

This Data is used as a Threshold to detect Wafer folding from input data of sensors when doing Wafer Mapping. A value shall not be set a converted value of an actual Wafer thickness into a Pulse, but on the basis of sensing distance of sensors to detect Wafer folding. In addition, this Data may differ on the system as it is correlated with types and a Mapping speed of sensors used in Mapping.

[Parameter]   'No parameter': Return current status,

               'xxxxx': Threshold Data (Range: 1 ~ 99999, Unit: Pulse)

[Return]   "xxxxx₩n", "O₩n"

[Example]   Setting a Threshold value 600

   <Send>   CFG_THRES 600₩n

   <Receive> A₩n

   <Receive> O₩n

1.5.18.   CFG_UFAC

[Expression]   "CFG_UFAC [*n*]₩n"

[Description] This sets a Calibration Factor value when doing Up Mapping. This performs
             the same function as a [MAIN/SET/POD/ UFac] menu of TP.

[Parameter]   'No parameter': Return current status, 'xxxxxxx': Position Data

[Return]   "xxxxxxxx₩n", "O₩n"

[Example]   Setting an Up Calibration Factor 900

   <Send>   CFG_DFAC 900₩n

   <Receive> A₩n

   <Receive> O₩n

1.5.19.   CFG_WPOS

[Expression]   "CFG_WPOS [*n*]₩n"

[Description] This sets the first Wafer position in a POD and checks the setting. This
             Command performs the same function as [MAIN/SET/POD/W11] of TP..

[Parameter]   'No parameter': Return current status,

               'xxxxxxx': Position Data (Range: 1 ~ 9999999, Unit: Pulse)

[Return]   "xxxxxxx₩n", "O₩n"

[Example]   Setting the fist Wafer position at 942

   <Send>   CFG_WPOS 942₩n

   <Receive> A₩n

   <Receive> O₩n

1.5.20.   CFG_STA_EVENT

[Expression]   "CFG_STA_EVENT [*ON/OFF*]₩n"

[Description] Check the setting of CFG_STA_EVENT or sets whether to use.

             Status of all Command at CFG_STA_EVENT ON SHOW

 [Parameter]   'No parameter': Return current status,

             'ON': CFG_STA_EVENT Enable, 'OFF': CFG_STA_EVENT Disable

[Return]   "ON(OFF)₩n", "O₩n"

[Example]   CFG_STA_EVENT feature set to ON

   <Send>   CFG_STA_EVENT ON₩n

   <Receive> A₩n

   <Receive> O₩n

1.5.21.   CFG_RET_CHECK

[Expression]   "CFG_RET_CHECK [*ON/OFF*]₩n"

[Description]   RETRECT SIGNAL Set whether to use the ATM or check the current status with the command that will perform the same function as TP[MAIN/SET/FUNC/RET].

With the ATM EXTEND mapping or Door operation when opening/closing, ERR_RobotRetract will be posted.

[Parameter]   'No parameter': Return current status,

'ON': RETRECT SIGNAL Enable, 'OFF': RETRECT SIGNAL Disable

[Return]   "ON(OFF)₩n", "O₩n"

[Example]   RETRECT SIGNAL USE is set to ON

    <Send>   CFG_RET_CHECK ON₩n

    <Receive> A₩n

    <Receive> O₩n

1.5.22.   UNLOAD(CLOSE)

[Expression]   "UNLOAD₩n"

[Description]   This unloads a Pod automatically in sequence.

Mapping information shall be sent in case the Mapping system is installed in DURAPORT and doing Up-mapping and all are set at "0" in case a <u>Mapping option is not available.</u>

 [Parameter]   Nothing

[Return]   "Mxxxxxxxx,xxxxxxxx,xxxxxxxx₩n"

Character M is an identifier representing Mapping information and " xxxxxxxx " is ASCII Code Data converted from a Hex Code. The first 8 digits Data after an identifier represents whether the Wafer is available or not, the second represents Cross Slots information and the third represents Double Slot information.

 [Example]   In case of no Mapping Option

    <Send>   UNLOAD₩n

    <Receive> A₩n

    <Receive> M00000000,00000000,00000000₩n

1.5.23.   DEVICE_ID

[Expression]   "DEVICE_ID [*n*]₩n"

[Description] This sets an intrinsic Device ID of DURAPORT or checks set Data. This
                Command performs the same function as [MAIN/SET/D_ID] of TP.

[Parameter]   'No parameter': Return current status,

                'xxxxxx': ID Data (Range: 0 ~ 32767, Unit: Pulse)

[Return]   "xxxxxx₩n", "O₩n"

[Example]   Checking to set a Device ID of DURAPORT 1234

    <Send>   DEVICE_ID₩n
    <Receive> A₩n
    <Receive> 256₩n
    <Send>   DEVICE_ID 1234₩n
    <Receive> A₩n
    <Receive> O₩n

[Reference sections]

    4.4.7. SETting

1.5.24.   DOCK

[Expression]   "DOCK₩n"

[Description]   This moves a Pod to Docking position.

[Parameter]   Nothing

[Return]   "O₩n"

[Example]

   <Send>   DOCK₩n

   <Receive> A₩n

   <Receive> O₩n

1.5.25.   ECODE

[Expression]   "ECODE₩n"

[Description]   This retrieves an Error Code and its simple description that occurred last.

[Parameter]   Nothing

[Return]   "Exxx cccccccccccccccccccc ₩n"

                  Character E is an identifier representing an Error code, "xxx" is an actual Error Code.   "cccccccccccccccccccc" represents simple English description with about 20 character strings on an Error currently occurred.

[Example]   In case an Error occurred lastly is a Latch Open Error

   <Send>   ECODE₩n

   <Receive> A₩n

   <Receive> E13 Latch Open Error₩n

1.5.26.   GETMAP

[Expression]   "GETMAP₩n"

[Description]   This retrieves the latest information stored in the Memory of DURAPORT.

[Parameter]   Nothing

[Return]   "Mxxxxxxxx,xxxxxxxx,xxxxxxxx₩n"

A response format is the same as "LOAD" & "UNLOAD" Commands.

[Example]   Normal Wafer exists in slot 1, 9, 10, 11, 12.

   <Send>   GETMAP₩n

   <Receive> A₩n

   <Receive> M00000F01,00000000,00000000₩n

1.5.27.   GETVER

[Expression]   "GETVER₩n"

[Description]   This retrieves the Firmware Version of DURAPORT.

[Parameter]   Nothing

[Return]   "VER x.xxyy₩n"

[Example]   In case the F/W version of DURAPORT IS "L2.01A4"

   <Send>   GETVER₩n

   <Receive> A₩n

   <Receive> VER L2.01A4₩n

1.5.28.   HOM

[Expression]   "HOM [*n*]₩n"

[Description]   This performs Homing of an axis designated by a parameter and clears an Event.

In case an All Home, namely "HOM A₩n" or "HOM₩n" Command is directed, Homing sequence may change depending on the system status and DURAPORT decides on Homing sequence by checking various sensors and present Position & Configuration when a Command is received. In case a Pod is in an Open status, a door of Pod is closed and locking of a Pod is released after completing Homing.

This Command must be performed under the condition FOUP is positioned in DURAPORT.

[Parameter]   'No parameter': All axes, '1': Z-axis, 'A': All axes,

'O': Performing "LOAD" operation after Homing on all axes is implemented.

[Return]   "O₩n"

[Example]   In case Homing all axes

     <Send>   HOM A₩n

     <Receive>   A₩n

     <Receive>   O₩n

1.5.29.   INDICATOR_LOAD

[Expression]   "INDICATOR_LOAD [*ON/OFF/BLINK*]₩n"

[Description]   This turns an Indicator Load LED on/off or blinks it. .

[Parameter]   'No parameter': Return current status,

                'ON': LOAD Indicator ON ,

                'OFF': LOAD Indicator OFF

                'BLINK':LOAD Indicator Blink

[Return]   "O₩n"

[Example]

    <Send>   INDICATOR_LOAD ON₩n

    <Receive> A₩n

    <Receive> O₩n

[Reference sections]

1.5.30.   INDICATOR_UNLOAD

[Expression]   "INDICATOR_UNLOAD [*ON/OFF/BLINK*]₩n"

[Description]   This turns an Indicator Unload LED on/off or blinks it. .

[Parameter]   'No parameter': Return current status,

 'ON': UNLOAD Indicator ON ,

 'OFF': UNLOAD Indicator OFF

 'BLINK':UNLOAD Indicator Blink

[Return]   "O₩n"

[Example]

 <Send>   INDICATOR_UNLOAD ON₩n
 <Receive> A₩n
 <Receive> O₩n

[Reference sections]

1.5.31.   INDICATOR_AUTO

[Expression]   "INDICATOR_AUTO [*ON/OFF/BLINK*]₩n"

[Description]   This turns an Indicator Auto LED on/off or blinks it. .

[Parameter]   'No parameter': Return current status,

 'ON': AUTO Indicator ON ,

 'OFF': AUTO Indicator OFF

 'BLINK':AUTO Indicator Blink

[Return]   "O₩n"

[Example]

    <Send>   INDICATOR_AUTO ON₩n

    <Receive> A₩n

    <Receive> O₩n

[Reference sections]

1.5.32.   INDICATOR_MANUAL

[Expression]   "INDICATOR_MANUAL [*ON/OFF/BLINK*]₩n"

[Description]   This turns an Indicator Manual LED on/off or blinks it.

[Parameter]   'No parameter': Return current status,

           'ON': MANUAL Indicator ON,

           'OFF': MANUAL Indicator OFF

           'BLINK': MANUAL Indicator Blink

[Return]   "O₩n"

[Example]

    <Send>   INDICATOR_MANUAL ON₩n

    <Receive> A₩n

    <Receive> O₩n

[Reference sections]

1.5.33.   INDICATOR_RESERVE

[Expression]   "INDICATOR_RESERVE [*ON/OFF/BLINK*]₩n"

[Description]   This turns an Indicator Reserve LED on/off or blinks it. .

[Parameter]   'No parameter': Return current status,

                'ON': RESERVE Indicator ON,

                'OFF': RESERVE Indicator OFF

                'BLINK': RESERVE Indicator Blink

[Return]   "O₩n"

[Example]

    <Send>   INDICATOR_RESERVE ON₩n

    <Receive> A₩n

    <Receive> O₩n

[Reference sections]

1.5.34.   INDICATOR_LBUTTON

[Expression]   "INDICATOR_LBUTTON [*ON/OFF/BLINK*]₩n"

[Description]   This turns a Load Button LED on/off or blinks it. .

[Parameter]   'No parameter': Return current status,

                'ON': LOAD BUTTON Indicator ON,

                'OFF': LOAD BUTTON Indicator OFF

                'BLINK': LOAD BUTTON Indicator Blink

[Return]   "O₩n"

[Example]

    <Send>   INDICATOR_LBUTTON ON₩n

    <Receive> A₩n

    <Receive> O₩n

[Reference sections]

1.5.35.   INDICATOR_UBUTTON

[Expression]   "INDICATOR_UBUTTON [*ON/OFF/BLINK*]₩n"

[Description]   This turns a Unload Button LED on/off or blinks it. .

[Parameter]   'No parameter': Return current status,

                'ON': UNLOAD BUTTON Indicator ON,

                'OFF': UNLOAD BUTTON Indicator OFF

                'BLINK': UNLOAD BUTTON Indicator Blink

[Return]   "O₩n"

[Example]

    <Send>   INDICATOR_UBUTTON ON₩n
    <Receive> A₩n
    <Receive> O₩n

[Reference sections]

1.5.36.   MAINT_MODE

[Expression]   "MAINT_MODE [*ON/OFF*]₩n"

[Description]   This changes the setting of a Maintenance Mode in DURAPORT or checks a current status.

                Normal automatic operation Commands such as "LOAD", "UNLOAD" & "Scan" shall not be performed in case a Maintenance mode is set ON and service Commands such as "MDOR_LOCK", "MLIFT_DN", "MPOD_LOCK", "MDOR_OPN" and "MVAC" shall not be performed in case a Maintenance Mode is set Off.

[Parameter]   'No parameter': Return current status,

                'ON': Maintenance mode Enable, 'OFF': Maintenance mode Disable

'N': Unknown

[Return]   "ON(OFF)₩n", "O₩n", "N₩n"

[Example]   Checking the setting of a Maintenance Mode and setting it ON

   <Send>   MAINT_MODE₩n

   <Receive> A₩n

   <Receive> OFF₩n

   <Send>   MAINT_MODE ON₩n

   <Receive> A₩n

   <Receive> O₩n

1.5.37.   MAP_DATA

[Expression]   "MAP_DATA [*ON/OFF*]₩n"

[Description] This sets use of a Mapping Data transmission function or checks the current status. This performs the same function as [MAIN/SET/FUNC/MData] of TP.

[Parameter]   'No parameter': Return current status,

                'ON': Mapping Data Transfer Mode Enable,

                'OFF': Mapping Data Transfer Mode disable.

[Return]   "ON(OFF)₩n", "O₩n"

[Example]

   <Send>   MAP_DATA ON₩n

   <Receive> A₩n

   <Receive> O₩n

1.5.38.   MDOR_LOCK

[Expression]   "MDOR_LOCK [*ON/OFF*]₩n"

[Description] This drives the Latch Key of Port Door or checks the current status. This performs the same function as [MAIN/MTN/Lach] of TP.

[Parameter]   'No parameter': Return current status,

'ON': Moving a Latch key to Locking position, 'OFF': Moving a Latch key to Unlocking position

'N': Unknown

[Return]   "ON(OFF)₩n", "O₩n", "N₩n"

[Example]

    <Send>   MDOR_LOCK ON₩n

    <Receive> A₩n

    <Receive> O₩n

1.5.39.   MDOR_OPN

[Expression]   "MDOR_OPN [*ON/OFF*]₩n"

[Description] This moves a Port Door to Open/Close position or checks the current status. This performs the same function as [MAIN/MTN/O/C] of TP.

[Parameter]   'No parameter': Return current status,

'ON': Moving a Port Door to Open position, 'OFF': Moving a Port Door to Close position

'N': Unknown

[Return]   "ON(OFF)₩n", "O₩n", "N₩n"

[Example]

    <Send>   MDOR_OPN ON₩n

    <Receive> A₩n

    <Receive> O₩n

1.5.40.   MLIFT_DN

[Expression]   "MLIFT_DN [*ON/OFF*]₩n"

[Description] This drives a Vertical Door Lift vertically or checks the current status. This performs the same function as [MAIN/MTN/U/D] of TP.

[Parameter]   'No parameter': Return current status,

'ON': Moving a Vertical Door Lift to P1 position (Down),

'OFF': Moving a Vertical Door Lift to P0 position (Up)

[Return]   "ON(OFF)₩n", "O₩n"

[Example]

    <Send>   MLIFT_DN ON₩n

    <Receive> A₩n

    <Receive> O₩n

1.5.41.   MPOD_LOCK

[Expression]   "MPOD_LOCK [*ON/OFF*]₩n"

[Description] This drives the Pod Locking System of Stage or checks the current status. This performs the same function as [MAIN/DIAG/PLok] of TP.

[Parameter]   'No parameter': Return current status,

'ON': Pod Locking, 'OFF': Pod Unlocking, 'N': Unknown

[Return]   "ON(OFF)₩n", "O₩n", "N₩n"

[Example]

    <Send>   MPOD_LOCK ON₩n

    <Receive> A₩n

    <Receive> O₩n

1.5.42.   MVAC

[Expression]   "MVAC [*ON/OFF*]₩n"

[Description] This drives Vacuum of a Port Door or checks the current status. This performs the same function as [MAIN/DIAG/Vac] of TP.

[Parameter]   'No parameter': Return current status,

'ON': Vacuum On, 'OFF': Vacuum Off, 'N': Unknown

[Return]   "ON(OFF)₩n", "O₩n", "N₩n"

[Example]

    <Send>   MVAC ON₩n

    <Receive> A₩n

    <Receive> O₩n

1.5.43.   LOAD(OPEN)

[Expression]   "LOAD₩n"

[Description]   This loads a Pod automatically in sequence.

Mapping information shall be sent in case the Mapping system is installed in DURAPORT and doing Down-mapping and all are set at "0" in case a Mapping option is not available.

[Parameter]   Nothing

[Return]   "Mxxxxxxxx,xxxxxxxx,xxxxxxxx₩n"

Character M is an identifier representing Mapping information and   " xxxxxxxx " is ASCII Code Data converted from a Hex Code. The first 8 digits Data after an identifier represents whether the Wafer is available or not, the second represents Cross Slots information and the third represents Double Slots information.

[Example]

    ① Mapping"LOAD₩n   In case of no Mapping Option

    <Send>   LOAD₩n

    <Receive> A₩n

    <Receive> M00000000,00000000,00000000₩n

② The outcome of Mapping in case the Wafers are in the #4 & 5 Slots, one Wafer is crossed over #1 & 2 Slots (Cross Slot Case) and two Wafers are overlapped in #3 Slot (Double Slot Case)

<Send>   LOAD₩n

<Receive> A₩n

<Receive> M0000001D,00000001,00000004₩n

          [wafer or empty]   0000 0000 0000 0000 0000 0000 0001 1101

          [cross slot]   0000 0000 0000 0000 0000 0000 0000 0001

          [double slot]   0000 0000 0000 0000 0000 0000 0000 0100

1.5.44.   POD_LOCK

[Expression]   "POD_LOCK [*ON/OFF*]₩n"

[Description] This drives the Pod Locking System of a Stage or checks the current status. This performs the same function as [MAIN/DIAG/PLok] of TP.

[Parameter]   'No parameter': Return current status,

          'ON': Pod Locking, 'OFF': Pod Unlocking, 'N': Unknown

[Return]   "ON(OFF)₩n", "O₩n", "N₩n"

[Example]

    <Send>   POD_LOCK ON₩n

    <Receive> A₩n

    <Receive> O₩n

1.5.45.   RESERVE

[Expression]   "RESERVE [*ON/OFF*]₩n"

[Description]   This turns a Reserve Indicator on/off or checks the current status.

[Parameter]   'No parameter': Return current status,

          'ON': Reserve Indicator Enable, 'OFF': Reserve Indicator Disable

[Return]   "ON(OFF)₩n", "O₩n"

[Example]   Checking the status of a Reserve Indicator and setting it on

    \<Send\>   RESERVE₩n

    \<Receive\> A₩n

    \<Receive\> OFF₩n

    \<Send\>   RESERVE ON₩n

    \<Receive\> A₩n

    \<Receive\> O₩n

1.5.46.   RES_B

[Expression]   "RES_B [*ON/OFF*]₩n"

[Description] This sets to blink a Reserve Indicator on & off twice per every second or checks the setting.

[Parameter]   'No parameter': Return current status,

                'ON': Reserve Indicator Blink Enable, 'OFF': Reserve Indicator Blink Disable

[Return]   "ON(OFF)₩n", "O₩n"

[Example]

    \<Send\>   RES_B₩n

    \<Receive\> A₩n

    \<Receive\> OFF₩n

    \<Send\>   RES_B ON₩n

    \<Receive\> A₩n

    \<Receive\> O₩n

1.5.47.   RESET

[Expression]   "RESET₩n"

[Description]   This clears all Errors in DURAPORT.

[Parameter]   Nothing

[Return]   "O₩n"

[Example]

    <Send>   RESET₩n

    <Receive> A₩n

    <Receive> O₩n

1.5.48.   SAVE_ALL

[Expression]   "SAVE_ALL₩n"

[Description]   This saves all set Data in the Flash Memory.

                Changed Data must be saved with this Command after the Configuration
                Commands such as "CFG_A0_P0", "CFG_A0_P1", "CFG_A0_P2" and
                "CFG_PITCH", etc. are used. Otherwise, all set Data may be lost as it is not
                saved in the non-volatile Memory, depending on the status of System. In
                addition, make it sure not to overwrite the non-volatile Flash Memory of
                main controller in DURAPORT so frequently for protection of it as it has
                limitation in number of overwriting.

[Parameter]   Nothing

[Return]   "O₩n"

[Example]

    <Send>   SAVE_ALL₩n

    <Receive> A₩n

    <Receive> O₩n

1.5.49.   SCAN

[Expression]   "SCAN [*UP/DN*]₩n"

[Description]   This performs Mapping and restores its outputs.

This Command must be used while POD is "'OPEN".

[Parameter]   'UP': Performing Up-Mapping, 'DN': Performing Down-Mapping

[Return]   "Mxxxxxxxx,xxxxxxxx,xxxxxxxx₩n"

Response format is the same as "LOAD" & "UNLOAD" Commands. (Refer to
3.1.43. LOAD)

[Example]

①   In case the Wafers are correctly placed in Slot #1, 9, 10, 11 & 12 when doing Up
     Mapping

<Send>   SCAN UP₩n

<Receive> A₩n

<Receive> M00000F01,00000000,00000000

②   The outcome of Mapping in case the Wafers are in the #1, 2, 3, 4 & 5 Slots, one
     Wafer is crossed over #1 & 2 Slots (Cross Slot Case) and two Wafers are
     overlapped in #3 & 5 Slots (Double Slot Case), when doing Down Mapping

<Send>   SCAN DN₩n

<Receive> A₩n

<Receive> M0000001F,00000001,00000014₩n

1.5.50.   SEN_PLACE

[Expression]   "SEN_PLACE [*ON/OFF*]₩n"

[Description] This temporarily changes a set value for simulation of DURAPORT without a Pod or checks the current setting. This performs the same function as [MAIN/SET/SENS] =>Plc of TP.

[Parameter]   'No parameter': Return current status,

'ON': Enabling to confirm Placement Sensor input,

'OFF': Disabling to confirm Placement Sensor input

[Return]   "ON(OFF)₩n", "O₩n"

[Example]

   <Send>   SEN_PLACE ON₩n

   <Receive> A₩n

   <Receive> O₩n

1.5.51.   SEN_PLOCK

[Expression]   "SEN_PLOCK [*ON/OFF*]₩n"

[Description] This temporarily changes a set value of DURAPORT without a Pod or checks the current setting. This performs the same function as [MAIN/SET/SENS] =>Lock of TP.

[Parameter]   'No parameter': Return current status,

'ON': Enabling to confirm POD Lock Sensor input ,

'OFF': Disabling to confirm POD Lock Sensor input

[Return]   "ON(OFF)₩n", "O₩n"

[Example]

   <Send>   SEN_PLOCK ON₩n

   <Receive> A₩n

   <Receive> O₩n

1.5.52.   SEN_VAC

[Expression]   "SEN_VAC [*ON/OFF*]\n"

[Description] This temporarily changes a set value of DURAPORT without a Pod or checks
the current setting. This performs the same function as [MAIN/SET/SENS]
=>Vac of TP.

[Parameter]   'No parameter': Return current status,

'ON': Enabling a function to check a Cassette, 'OFF': Disabling a function to
check a Cassette

[Return]   "ON(OFF)\n", "O\n"

[Example]

<Send>   SEN_VAC ON\n

<Receive> A\n

<Receive> O\n

1.5.53.   STATUS

[Expression]   "STATUS\n"

[Description]   This reports all the status of DURAPORT to the Host.

[Parameter]   Nothing

[Return]   "Sxxxxxxxx\n"

Character S is an identifier representing the status information and "
xxxxxxxx " is ASCII Code Data converted from a Hex Code.

[Example]   In case Response is "S00D0000B"

[Binary]   0000 0000 1101 0000 0000 0000 0000 1011

[Meaning]   Homing Done, Motor Driver ON, Closed, AMHS Enable, Mapping Enable,
Auto Mode On

[Reference sections]

Bit NO	Description
[Bit0]	DURAPORT Homing Completes yes/no (1=Complete, 0=Not complete)
[Bit1]	Motor Driver ON yes/no (1=ON, 0=OFF)
[Bit2]	Open condition (1=Opened, 0=Not Opened)
[Bit3]	Close condition (1=Closed, 0=Not Closed)
[Bit4]	Condition of acting (1=On acting, 0=On Stop)
[Bit5]	Backup Data's Crash yes/no (1=Presence of not normal Data, 0=Data normal)
[Bit6]	Maintenance Mode condition (1=Enable, 0=Disable)
[Bit7]	Reserve
[Bit8]	Reserve
[Bit9]	POD clamped (1=Clamped, 0=Not clamped)
[Bit10]	POD unclamped (1=Unclamped, 0=Not unclamped)
[Bit11]	POD docked (1=Docked, 0=Not docked)
[Bit12]	POD undocked (1=Undocked, 0=Not undocked)
[Bit13]	Vacuum Condition (1=Vacuum, 0=Not Vacuum)
[Bit14]	Latch Condition (1=Latch, 0=Not Latch)
[Bit15]	Unlatch Condition (1=Unlatch, 0=Not Unlatch)
[Bit16]	Error occurrence condition (1=Error occurred, 0=No Error)
[Bit17]	Door Open Condition (1=Door Opened, 0=Door Not Opened)
[Bit18]	Door Close Condition (1=Door Closed, 0=Door Not Closed)
[Bit19]	Z Axis Down Condition (1=At Down Position, 0=Not at Down Position)
[Bit20]	Z Axis Up Condition (1=At Up Position, 0=Not at Up Position)
[Bit21]	Reserved
[Bit22]	Mapping function usage yes/no (1=Enable, 0=Disable)
[Bit23]	Auto Mode condition (1=Auto Handoff, 0=Manual Handoff)
[Bit24]	Load/Unload ID Switch usage yes/no (1=Used, 0=Not Used)
[Bit25]	Open Cassette usage yes/no (1=OC Used, 0=POD Used)
[Bit26]	Reserve condition of Load port (1=Reserved, 0=Not Reserved) (Refer to SEMI-E87)
[Bit27]	Reserved

[Bit28]	Placement Sensor condition (1=ON, 0=OFF)
[Bit29]	Present Sensor condition (1=ON, 0=OFF)
[Bit30]	Wafer Slide Out, Protrusion Condition (1=On, 0=OFF)
[Bit31]	Reserved

[Table 1–3]   System Status definitions

1.5.54.   STATUS_INDICATOR

[Expression]   "STATUS_INDICATOR₩n"

[Description]   This reports the status of indicators in DURAPORT to the Host.

[Parameter]   Nothing

[Return]   "Ixxxxxxxx₩n"

Character I is an identifier representing Indicator information and " xxxxxxxx "
is ASCII Code Data converted from a Hex Code.

Indicator information has 7 types, Load, Unload, Auto, Manual, Reserve, Load
Button and Unload Button and each information is given with 4 Bits starting
from #0.

NOT USE	UNLOAD BUTTON	LOAD BUTTON	RESERVE	MANUAL	AUTO	UNLOAD	LOAD
4Bits	4Bits	4Bits	4Bits	4Bits	4Bits	4Bits	4Bits

Each information is given with 4 Bits and indicates 3 different status.

In case of a Load Indicator, each status indicated with 0 ~ 3 Bit is as follows

If OFF 0X0 (Binary: 0000)

If ON 0X1 (Binary: 0001)

If BLINK 0X2 (Binary: 0010)

[Example]   In case Response is "I00010120"

[Binary]   0000 0000 0000 0001 0000 0001 0010 0000

[Meaning]   Unload Button Indicator : OFF

Load Button Indicator : OFF

Reserve Indicator: ON

Manual Indicator: OFF

Auto Indicator: ON

Unload Indicator: Blink

Load Indicator: OFF

[Reference sections]

Bit NO	Description
[Bit0]	LOAD INDICATOR (1=ON, 0=OFF)
[Bit1]	LOAD INDICATOR (1=BLINK, 0=NOT BLINK)
[Bit2~Bit3]	Don't Care
[Bit4]	UNLOAD INDICATOR (1=ON, 0=OFF)
[Bit5]	UNLOAD INDICATOR (1=BLINK, 0=NOT BLINK)
[Bit6~Bit7]	Don't Care
[Bit8]	AUTO INDICATOR (1=ON, 0=OFF)
[Bit9]	AUTO INDICATOR (1=BLINK, 0=NOT BLINK)
[Bit10~Bit11]	Don't Care
[Bit12]	MANUAL INDICATOR (1=ON, 0=OFF)
[Bit13]	MANUAL INDICATOR (1=BLINK, 0=NOT BLINK)
[Bit14~Bit15]	Don't Care
[Bit16]	RESERVE INDICATOR (1=ON, 0=OFF)
[Bit17]	RESERVE INDICATOR (1=BLINK, 0=NOT BLINK)
[Bit18~Bit19]	Don't Care
[Bit20]	LOAD BUTTON INDICATOR (1=ON, 0=OFF)

[Bit21]	LOAD BUTTON INDICATOR (1=BLINK, 0=NOT BLINK)
[Bit22~Bit23]	Don't Care
[Bit24]	UNLOAD BUTTON INDICATOR (1=ON, 0=OFF)
[Bit25]	UNLOAD BUTTON INDICATOR (1=BLINK, 0=NOT BLINK)
[Bit26~Bit31]	Don't Care

[Table 1–4]   System Status definitions

1.5.55.   STOP

[Expression]   "STOP₩n"

[Description]   This immediately stops the Motion of Duraport .

                This only operates during Duraport is running.
                Duraport will be changed to error state after STOP command executed.

[Parameter]   None.

[Return]   "O₩n"

[Example]   Sending Stop command during LOAD command is executing.

    <Send>   LOAD₩n

    <Receive> A₩n
    …<executing>…
    <Send>   STOP₩n
    <Receive> A₩n

    <Receive> O₩n → Respose of STOP Command.
    <Receive> E8 Stop by user₩n → Error response of LOAD Command.

1.5.56.   TCLOSE

[Expression]   "TCLOSE₩n"

[Description]   This temporarily closes a Door under LOAD and stands by.

                This only operates under LOAD.

[Parameter]   None.

[Return]   "O₩n"

[Example]

    <Send>   TCLOSE₩n

    <Receive> A₩n

    <Receive> O₩n

1.5.57.   TOPEN

[Expression]   "TOPEN\n"

[Description]   This is a Command to restore a Door to a Load status after temporarily closing it with a TCLOSE Command. This moves a Door to Load finish position without Mapping process. This operates only after TCLOSE.

[Parameter]   None.

[Return]   "O\n"

[Example]

    <Send>   TOPEN\n
    <Receive> A\n
    <Receive> O\n

1.5.58.   UNDOCK

[Expression]   "UNDOCK\n"

[Description]   This releases Pod Lock after moving a Pod to Undocking position.

[Parameter]   None.

[Return]   "O\n"

[Example]

    <Send>   UNDOCK\n
    <Receive> A\n
    <Receive> O\n

1.5.59.   CheckFpType

[Expression]   "CheckFpType\n"

[Description]   Notify the sensor state when FOUP is on the sensor (Info-Pad)

[Parameter]   None.

[Return]   "xx\n"

[Example]   Info-Pad sensing 'A', 'B', 'D'

<Send>   CheckFpType\n

<Receive>   A\n

<Receive>   0D\n

EVENT MESSAGE

If a state changes, DURAPORT transmits the changed state to the host. In this case, DURAPORT only transmits the state to the host, but it does not receive its response.

The state transmission is possible only if TP does not being connected.   While TP is currently connected, DURAPORT does not transmit a message to the host even if a state changes.

1.5.60.   Types of Event Messages and Meaning of Each Bit

State transmission message consists of identifier, data and LF: the identifier is 'C'; data consists of 8-

NO	Event	State Code	Descriptions
1	TP CONNECTED	0x00000001 [Bit0]	Currently connected TP
2	TP DISCONNECTED	0x00000002 [Bit1]	TP Disconnected
3	LOAD CONFIRM BUTTON PUSHED	0x00000004 [Bit2]	Load confirmation switch is currently pushed.
4	UNLOAD CONFIRM BUTTON PUSHED	0x00000008 [Bit3]	Unload confirmation switch is currently pushed.
5	FOUP PLACED	0x00000010 [Bit4]	POD(FOUP) is newly placed – all of Placement, Presence sensors are ON.
6	FOUP REMOVED	0x00000020 [Bit5]	POD(FOUP) is removed from a port.
7	START RESET ALL	0x00000100 [Bit8]	System Reset Switch is pushed -- System Reset starts.
8	END RESET ALL	0x00000200 [Bit9]	System Reset is complete.
9	DURAPORT STARTED	0x00010000 [Bit16]	System power up and firmware started for the first time.
10	FOUP INCORRECT POS	0x00020000 [Bit17]	**Occurs when POD is dislocated from docking position due to external causes under LOAD**
11	SIDE DOOR OPENED	0x01000000 [Bit24]	EFEM Side Door is opened.

[Table 1−5]   Types of Events and Meaning of Each Bit

1.5.61.   Configuration of State Transmission Message

State transmission message consists of identifier, data and LF: the identifier is 'C'; data consists of 8-digit ASCII string in bit; and the last is LF (0x0a) in sequence.

C	×	×	…	\n

0x43	×	×	…	0x0A

[Figure 1−4]   Event Message Format

Note)

```
1. If Load/Unload Confirm Button is pushed, duraport only sends event
   message and no action will be occurred.
```

1.5.62.   Event Message for Check FOUP (Info-Pad)

State transmission message consists of identifier, data and LF: data consists of 2

NO	Event	State Code	Descriptions (Detected sensor)
1		0x00	Not Sensing
2		0x01 [Bit0]	'D' Sensing
3		0x02 [Bit1]	'C' Sensing
4		0x03 [Bit0,1]	'C', 'D' Sensing
5		0x04 [Bit2]	'B' Sensing
6		0x05 [Bit0,2]	'B', 'D' Sensing
7		0x06 [Bit1,2]	'B', 'C' Sensing
8	FOUP PLACED	0x07 [Bit0,1,2]	'B', 'C', 'D' Sensing
9	(Info-Pad)	0x08 [Bit3]	'A' Sensing
10		0x09 [Bit0,3]	'A', 'D' Sensing
11		0x0A [Bit1,3]	'A', 'C' Sensing
12		0x0B [Bit0,1,3]	'A', 'C', 'D' Sensing
13		0x0C [Bit2,3]	'A', 'B' Sensing
14		0x0D [Bit0,2,3]	'A', 'B', 'D' Sensing
15		0x0E [Bit1,2,3]	'A', 'B', 'C' Sensing
16		0x0F [Bit1,2,3,4]	All Sensing

A.1.   ERROR CODE AND TROUBLESHOOTS

Code	Alarms	Reasons	Actions	N/A
2	Invalid Axis	Axis information is wrong.	1. Checking assignment of an axis from Host Commands	
3	Invalid Data	Ocuurs in case input dara deviates a scope designated by the system or unit, numbers, symbols are wrongly entered	1. Reentering after checking data	
4	Event State	Stop/EmStop Events Occurred. An E-Stop Switch is released or an Up/Down Limit Sensor is sensing	1. Checking whether an E-stop Switch is released 2. Checking whether a Z-axis Limit sensor is sensing 3. Checking whether a Servo Driver is on Alarm	
5	Driver Not On	A Driver(Amp) is OFF	1. Turning a Servo Motor Drive ON (AMP ON) 2. Checking whether an E-stop Switch is released	
6	Home Not Done	Occurs when a Command is performed while Homing is not completed	1. Performing All Homing	
7	Driver Error State	An Error occurred from a Servo Motor Drive	1. Resetting a Servo Drive or resetting again after shutting down Power (after rebooting)	
9	Error Not Cleared	A new Command is placed while an Error is not Cleared.	1. Placing an operation Command after clearing errors with a 'RESET' Command.	

Code	Alarms	Reasons	Actions	N/A
10	POD Not Opened	A Scan(Re-mapping) Command is placed while a FOUP is Closed	1. Retrying a SCAN Command whule a FOUP is Open	
11	POD TransIn Fail	A POD Trans In Sensor is not Sensing within a set time (5 sec) after a POD Docking Command is placed	Checking a cause a Trans In Sensor is not sensing 1. Checking abnormality of a POD Trans Motor 2. Checking abnormality of Sensors 3. Checking obstacles between POD and Port Doors	
12	POD TransOut Fail	A POD Trans Out Sensor is not Sensing within a set time (5 sec) after a POD Undocking Command is placed	Checking a cause a Trans Out Sensor is not sensing 1. Checking abnormality of a POD Trans Motor 2. Checking abnormality of Sensors	
13	Latch Open Fail	A Latch Open Sensor is not Sensing in a Latch Open position	Checking a cause a Latch Open Sensor is not sensing 1. Checking abnormality of Latch SOL. And a cylinder 2. Checking abnormality of Sensors	
14	Latch Close Fail	A Latch Close Sensor is not Sensing in a Latch Close position	Checking a cause a Latch Close Sensor is not sensing 1. Checking abnormality of Latch SOL. And a cylinder 2. Checking abnormality of Sensors	

Code	Alarms	Reasons	Actions	N/A
15	Mapping Arm Open Fail	A Mapping Arm Open Sensor is not Sensing within a set time (Overtime 5 sec) after Mapping Arm Open is operated	Checking a cause a Mapping Arm Open Sensor is not sensing after Mapping Arm Open is operated 1. Checking abnormality of a Mapping Arm Motor 2. Checking abnormality of Sensors	
16	Mapping Arm Close Fail	A Mapping Arm Open Sensor is not Sensing within a set time (Overtime 5 sec) after Mapping Arm Open is operated	Checking a cause a Mapping Arm Open Sensor is not sensing after Mapping Arm Open is operated 1. Checking abnormality of a Mapping Arm Motor 2. Checking abnormality of Sensors	
17	Vacuum On Fail	A Vacuum Sensor is not On when a Vacuum Solenoid is On after setting POD Trans In. Namely, Vacuum pressure is not formed between a Vacuum Cup and a FOUP door	1. Checking whether Vacuum is supplied by Specifications (- 50kPa) 2. Checking whether a FOUP Door is well aligned with a POD Door 3. Checking whether a Latch hole of FOUP is vertical 4. Checking abnormality of a Vacuum Sensor	
18	Vacuum Off Fail	A Vacuum Sensor is not Off after a Vacuum solenoid is Off.	1. Checking whether an On/Off Threshold value of Vacuum Sensor is set according to specifications 2. Checking abnormality of a Vacuum Sensor	

Code	Alarms	Reasons	Actions	N/A
19	Pod Placed Improperly	A FOUP is not properly positioned on a Stage of PDO	1. Checking whether a FOUP is properly positioned on a Stage 2. Checking whether Presence & Placement LEDs are On 3. Checking whether a Placement sensor is sensing while a FOUP is properly positioned 4. Checking abnormality of a Placement Sensor	
20	POD Door Not Exist	POD Door is not sensed	1. Checking whether Vacuum is supplied according to Specifications 2. Checking abnormality of a Vacuum Sensor	
21	POD Not Exist	Operation was tried without a FOUP	1. Checking whether a FOUP is properly positioned on a Stage 2. Checking abnormality of Placement & Presence Sensors	
22	Wafer Protrude	1. A Wafer Protrusion sensor is sensing before operating Close 2. A Wafer Protrusion sensor is sensing while Up/Down is operating (Safety)	1. Checking whether the Wafer is protruded out of a FOUP. 2. Checking any obstacles between light emitting and receiving 3. Checking alignment between light emitting and receiving	
23	Invalid Scan Start Position	Start Position Data that gets Mapping started is invalidly set	1. Checking whether the first Wafer position is properly set and Slot numbers or Distance Data of one Slot is properly set	
24	Scan Time Over	Up or Down operation time exceeds 10 sec.	1. Checking whether a Mapping speed and Up/Down operation time are set within a certain time range	
25	Stop Scan Motion	Up/Down operation stops before Mapping is terminated	1. Checking whether a Mapping speed and Up/Down operation time are set within a certain time range	

Code	Alarms	Reasons	Actions	N/A
26	Wafer Thickness	More than 2 Wafers are overlapped	1. Checking whether the Wafer is properly positioned 2. Checking whether thickness of the Wafer is properly assigned .(Adjusting W-T upward is based on an actual thickness of the Wafer in Mapping Data	
27	Wafer Position	The Wafer is crossing over two Slots	1. Checking whether a Wafer is properly positioned. 2. Teaching the first position of Wafer again	
28	Invalid Scan Input	A Wafer Detection Sensor value is abnormal	1. Checking the input status of a Wafer detecting Sensor. 2. Checking abnormality of a Mapping Sensor	
29	Invalid Scan Data	Too many Wafers are sensed. Namely, Wafer detecing On/Off points are too many due to chattering when sensing the Wafer	1. Checking the input status of a Wafer detecting Sensor. 2. Checking whether chattering occurs when sensing the Wafer due to vibration of a Z-axis	
31	Stop Time Over	A Motor revolves over defined time interval		
32	Escape Sensor Time Over	A Homing Bracket does not get out of a Homing Sensor in set time during Homing	1. Checking whether a Homing speed is too low	
33	Home Stop With Another Condition	A motor stopped due to other reasons than Limit Sensor Detection.		
34	Illegal Limit Sensor	A Limit sensor on the opposite direction of moving is sensing during Homing	1. Checking whether a +Limit sensor below is sensing during Homing	

Code	Alarms	Reasons	Actions	N/A
35	Limit Sensor Incorrect	Two Limit sensors are all sensing during Homing.	1. Checking whether two Limit Sensors are sensing during Homing	
36	Axis Position Incorrect	Position Data deviates over 200 pulse during operation.	1. Inquring to a manufacturer	
37	Home Condition Not Correct	Not a Homing condition. 1. In case a POD is in 1.1 Vacuum is On and Latch is Unlocked. 1.2 Vacuum is Off and Latch is Locked 2. In case a POD is not in Vacuum is On and a Latch is Locked.	1. Homing under a normal condition after all particles are removed from PDO door and Stage	
38	Limit Sensor Not In	A Limit Sensor is not sensing after a Latch Opens and Closes	1. Checking causes a Limit sensor is not sensing after a Latch opens and closes 2. Performing All HOM	N/A
39	Out of Sw Limit	1. A position set value is over a Sw Limit value	1. Adjusting a Software Limit value to proper position. 2. Checking a position set value	
40	Pinch Point	A Pinch point sensor is sensing	1. Checking any obstacles between light emitting & receiving sensors of a Pinch sensor. 2. Readjusting alignment between lifgt emitting & receiving sensors .	

Code	Alarms	Reasons	Actions	N/A
55	SwLimit Over	A Motor passes a SW Limit during operation	1.Comparing a S/W value at set position to move to.	
56	HwLimit Over	A H/W Limit sensor is sensing during operation	1. Operating again after Homing . 2. Comparing a H/W value at set position to move to.	
57	Tracking Error	Deviation between target position & current position exosts during operation	1. Adjusting Servo drive gain.	
58	Em Stop Pressed	A E-Stop button is released during operation.	1. Operating again agter an E-Stop condition is released	
59	Driver Error	A Servo Drive Error is sensed	1. Operating again after performing Amp On and Homing upom Power is OFF and ON	
60	Incorrect Docking Position	Stage is invalid docking position.	1.Operating Home or Reset	
62	Tp Not Connect	TP is not connected.	1. Checking a TP Cable. 2. Consult with the provider.	
64	Pod Lock Fail	A POD Lock sensor is not sensing after POD Lock is operated	1. Checkubg a cause a Lock sensor is not sensing at FOUP Lock Position	
65	Pod Unlock Fail	A POD UlLock sensor is not sensing after POD Unlock is operated	1. Checkubg a cause a Unlock sensor is not sensing at FOUP Unlock Position	
66	Port Door Open Fail	A Port door open sensor is not sensing after Port door open operation	1. Checking a cause a Port door open sensor is not sensing while a PDO Door is Open	
67	Port Door Close Fail	A Port door close sensor is not sensing after Port door close operation	1. Checking a cause a Port door close sensor is not sensing while a PDO Door is closed	

Code	Alarms	Reasons	Actions	N/A
68	Maint Mode	A Maint_Mode is Enabled.	1. Disabling a Maint_Mode	
69	Not Maint Mode	Maint_Mode is not Enableed	1. Enabling a Maint_Mode	
70	Invalid Argument	Parameters of a Command not defined are received.	1. An order is directed in accordance with right format	
77	Too Long Command	An order character string exceeds 200bytes.	1.Checking communication Cable line status	
79	Unknown Command	An undefined order is received.	1. Directing an order in proper format	
150	Robot Retract Signal is abnormal	'Robot Retract Signal' is Off (Normal Signal : On)	1. Checking robot arm retract status. 2. Checking robot retract signal status.	
151	Can Not TClose	A request for closing a door temporarily after Loading failed to be performed	Resolving interlock factors in the process of door Close after door up	
152	Can Not TOpen	Opening a door again after closing it failed	Removing interlock factors while a Door is moving down after a Door is open	
153	Side Door Interlock	Side door of EFEM is opened.	1. Checking side door status 2. Checking side door signal	
154	Prot Not Sensing Err	Protrusion Sensor is not detected after door closing.	1.Checking door status. 2.Checking Door Close Sensor and Cable	
155	Door Close Time Err	Door closing time of UNLOAD is short than door closing time of HOM.	1.Checking door status. 2.Checking Door Close Sensor and Cable	

Code	Alarms	Reasons	Actions	N/A
156	Foup Door Check Senser Detecing	Foup door check sensor was detected.	1. Checking Foup door status 2. Checking Foup door check sensor	
157	Mapping Sensor	Mapping Sensor detected (Mapping Arm Open Status).	1. Checking Amp 2. Checking Aligin	
158	Left Mapping Arm Signal Fail	In and Out position sensor of left mapping arm detected at the same time.	1. Checking sensor position 2. Checking sensor signal	
159	Right Mapping Arm Signal Fail	In and Out position sensor of right mapping arm detected at the same time.	1. Checking sensor position 2. Checking sensor signal	
160	Left/Right Mapping Arm Signal Fail	In and Out position sensor of left/right mapping arm detected at the same time.	1. Checking sensor position 2. Checking sensor signal	