

# YASKAWA Electric Corporation

## SR100 Ethernet

지원 버전 TOP Design Studio

V1.4.4 이상



### CONTENTS

본 사 (주)MXOn의 "Touch Operation Panel(MXOn TOP) Series"를 사용해 주시는 고객님께 감사 드립니다. 본 매뉴얼을 읽고 "TOP-외부장치"의 접속 방법 및 절차를 숙지해 주십시오.

#### 1. 시스템 구성 [2 페이지](#)

접속에 필요한 기기, 각 기기의 설정, 케이블, 구성 가능한 시스템에 대해 설명합니다.

#### 2. 외부 장치 선택 [3 페이지](#)

TOP 기종과 외부 장치를 선택합니다.

#### 3. TOP 통신 설정 [4 페이지](#)

TOP 통신 설정 방법에 대해서 설명합니다..

#### 4. 지원 어드레스 [9 페이지](#)

본 절을 참조하여 외부 장치와 통신 가능한 어드레스를 확인하십시오..

# 1. 시스템 구성

TOP와 "YASKAWA Electric Corporation – SR100" 의 시스템 구성은 아래와 같습니다.

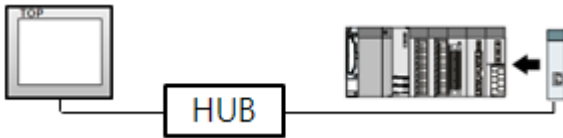
시리즈	통신 방식	통신설정	케이블
YASKAWA Electric Corporation – SR100	TCP	<a href="#">3. TOP 통신 설정</a>	트위스트 페어 케이블 <sup>*주1)</sup>

<sup>\*주1)</sup> 트위스트 페어 케이블

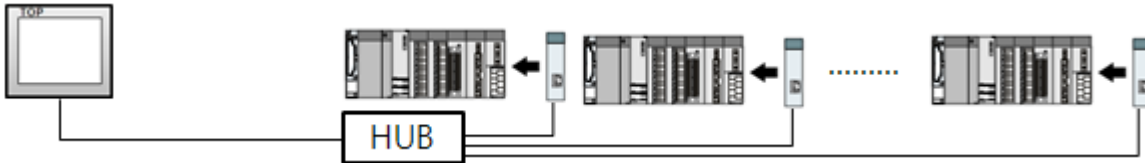
- STP(실드 트위스트 페어 케이블) 혹은 UTP(비실드 트위스트 페어 케이블) 카테고리 3, 4, 5 를 의미합니다.
- 네트워크 구성에 따라 허브, 트랜시버 등의 구성기기에 접속 가능하며 이 경우 다이렉트 케이블을 사용 하십시오.

## ■ 연결 가능 구성

- 1 : 1 연결(TOP 1 대와 외부 장치 1 대) 연결

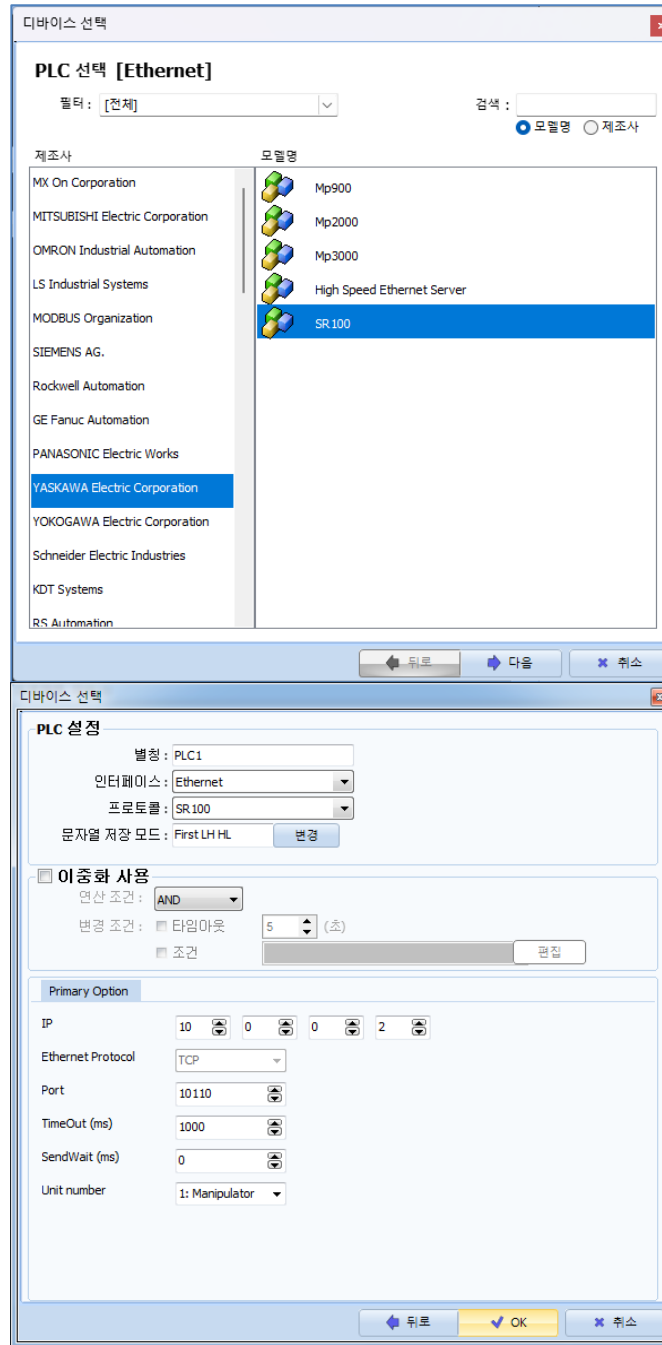


- 1 : N 연결(TOP 1 대와 외부 장치 여러 대) 연결



## 2. 외부 장치 선택

■ TOP 모델 및 포트 선택 후 외부 장치를 선택합니다.



설정 사항		내 용					
TOP	모델	TOP 디스플레이와 프로세스를 확인하여 터치 모델을 선택합니다.					
외부 장치	제조사	TOP와 연결할 외부 장치의 제조사를 선택합니다. "YASKAWA Electric Corporation"를 선택 하십시오.					
	PLC	TOP와 연결할 외부 장치를 선택합니다. <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: black; color: white;">모델</th> <th style="background-color: black; color: white;">인터페이스</th> <th style="background-color: black; color: white;">프로토콜</th> </tr> </thead> <tbody> <tr> <td>SR100</td> <td>Ethernet</td> <td>SR100</td> </tr> </tbody> </table> <p>연결을 원하는 외부 장치가 시스템 구성 가능한 기종인지 1장의 시스템 구성에서 확인 하시기 바랍니다.</p>	모델	인터페이스	프로토콜	SR100	Ethernet
모델	인터페이스	프로토콜					
SR100	Ethernet	SR100					

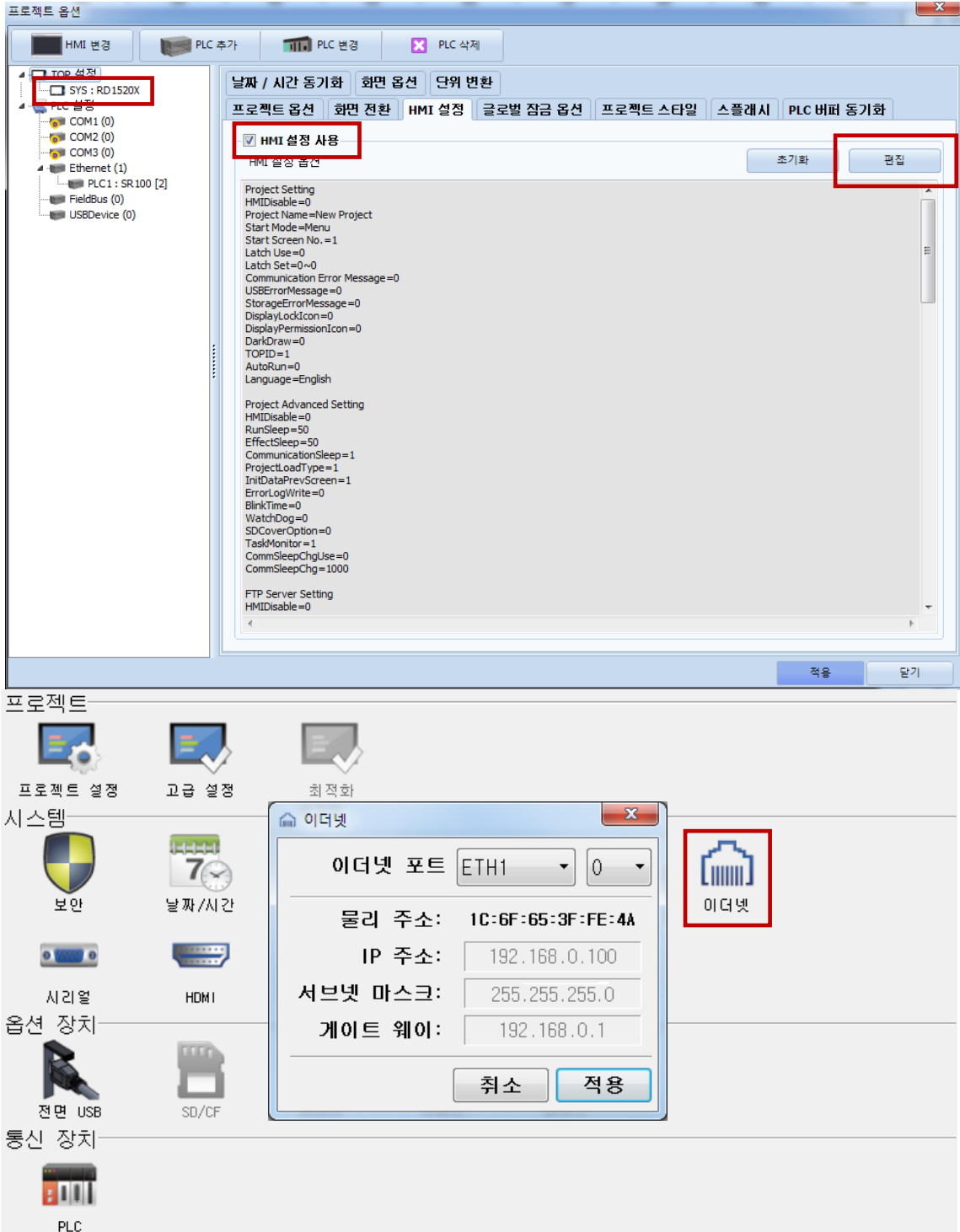
### 3. TOP 통신 설정

통신 설정은 TOP Design Studio 혹은 TOP 메인 메뉴에서 설정 가능 합니다. 통신 설정은 외부 장치와 동일하게 설정해야 합니다.

#### 3.1 TOP Design Studio 에서 통신 설정

##### (1) 통신 인터페이스 설정

- [ 프로젝트 > 프로젝트 속성 > TOP 설정 ] → [ 프로젝트 옵션 > “HMI 설정 사용” 체크 > 편집 > 이더넷 ]
- TOP 통신 인터페이스를 TOP Design Studio에서 설정합니다.



항 목	TOP	외부 장치	비 고
IP 주소*주1)주2)	192.168.255.50	192.168.255.1	
서브넷 마스크	255.255.255.0	255.255.255.0	
게이트 웨이	192.168.0.1	192.168.0.1	

\*주1) TOP와 외부 장치의 네트워크 주소 (IP 앞 세자리 192.168.0.0)는 일치해야 합니다.

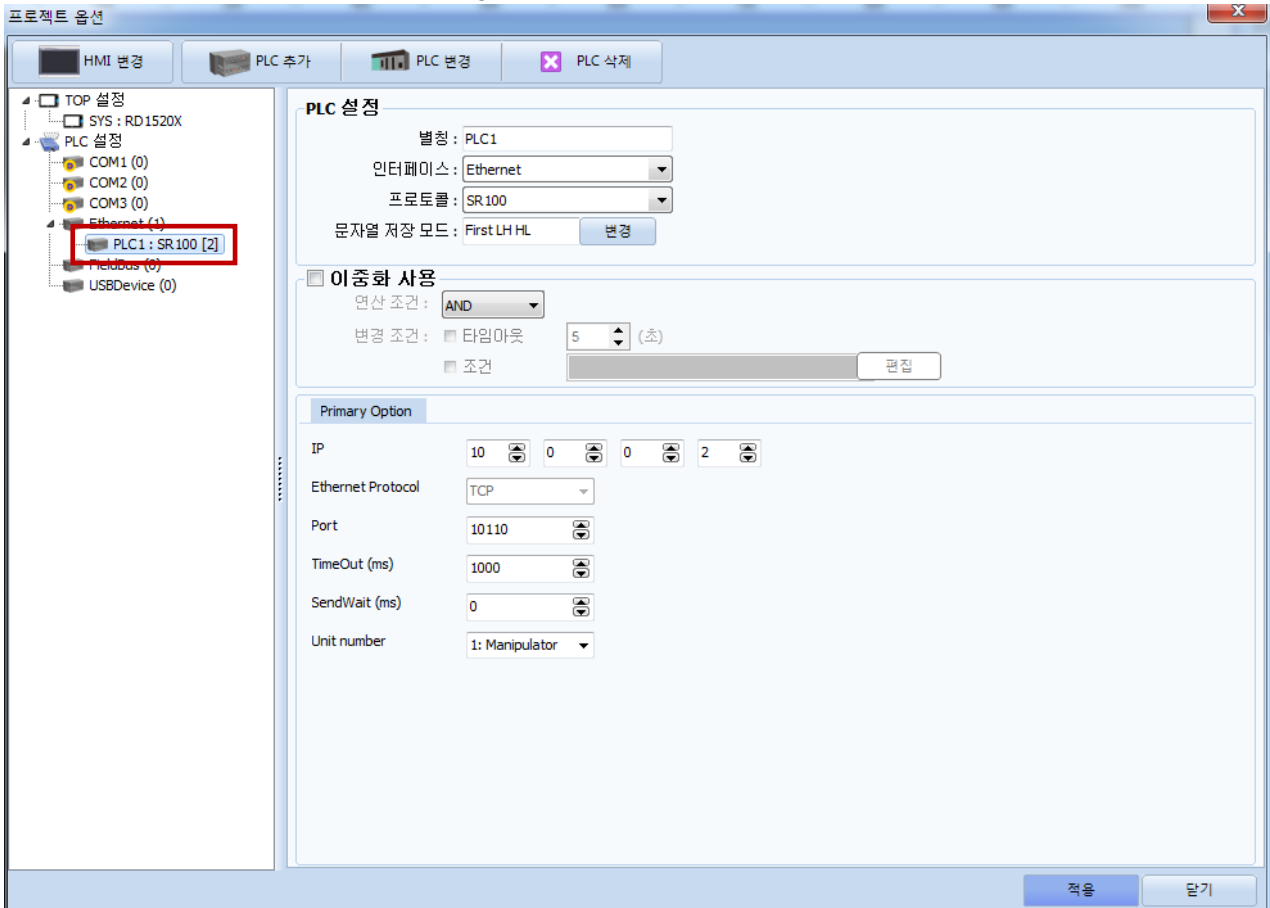
\*주2) 동일 네트워크 상에서 중복된 IP 주소를 사용하지 마십시오.

※ 위의 설정 내용은 본 사에서 권장하는 예제입니다.

항 목	설 명
IP 주소	네트워크 상에서 TOP가 사용 할 IP 주소를 설정합니다.
서브넷 마스크	네트워크의 서브넷 마스크를 입력합니다.
게이트 웨이	네트워크의 게이트 웨이를 입력합니다.

**(2) 통신 옵션 설정**

- [ 프로젝트 > 프로젝트 속성 > PLC 설정 > ETHERNET > "PLC1 : SR100" ]
- SR100 통신 드라이버의 옵션을 TOP Design Studio에서 설정합니다.



항 목	설 정	비 고
인터페이스	"Ethernet"을 선택합니다.	<a href="#">"2. 외부 장치 선택" 참고</a>
프로토콜	"SR100"을 선택합니다.	
IP	외부 장치의 IP 주소를 입력 합니다.	
Ethernet Protocol	TOP - 외부 장치 간 이더넷 프로토콜을 선택합니다.	고정
Port	외부 장치의 이더넷 통신 포트 번호를 입력합니다.	고정
TimeOut (ms)	TOP가 외부 장치로부터 응답을 기다리는 시간을 설정합니다.	
SendWait (ms)	TOP가 외부 장치로부터 응답 수신 후 다음 명령어 요청 전송 간에 대기 시간을 설정합니다.	
Unit number	1: Manipulator, 2: Pre-aligner 해당하는 Unit number를 설정합니다.	

### 3.2 TOP 에서 통신 설정

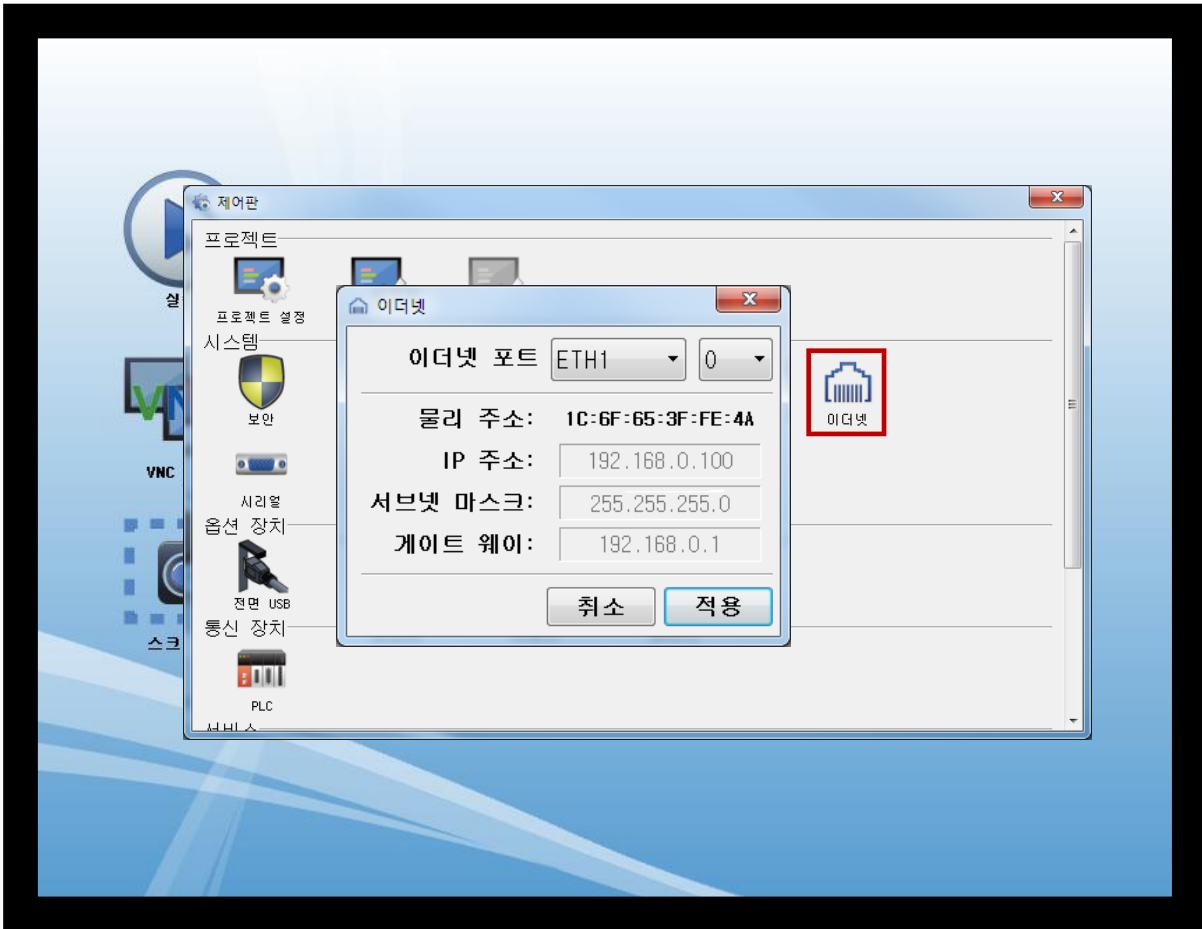
※ “3.1 TOP Design Studio 에서 통신 설정” 항목의 “HMI 설정 사용”을 체크 하지 않은 경우의 설정 방법입니다.

■ TOP 화면 상단을 터치하여 아래로 드래그 합니다. 팝업 창의 “EXIT”를 터치하여 메인 화면으로 이동합니다.



#### (1) 통신 인터페이스 설정

■ [ 메인 화면 > 제어판 > 이더넷 ]



항 목	TOP	외부 장치	비 고
IP 주소*주1)주2)	192.168.255.50	192.168.255.1	
서브넷 마스크	255.255.255.0	255.255.255.0	
게이트 웨이	192.168.0.1	192.168.0.1	

\*주1) TOP와 외부 장치의 네트워크 주소 (IP 앞 세자리 192.168.0.0)는 일치해야 합니다.

\*주2) 동일 네트워크 상에서 중복된 IP 주소를 사용하지 마십시오.

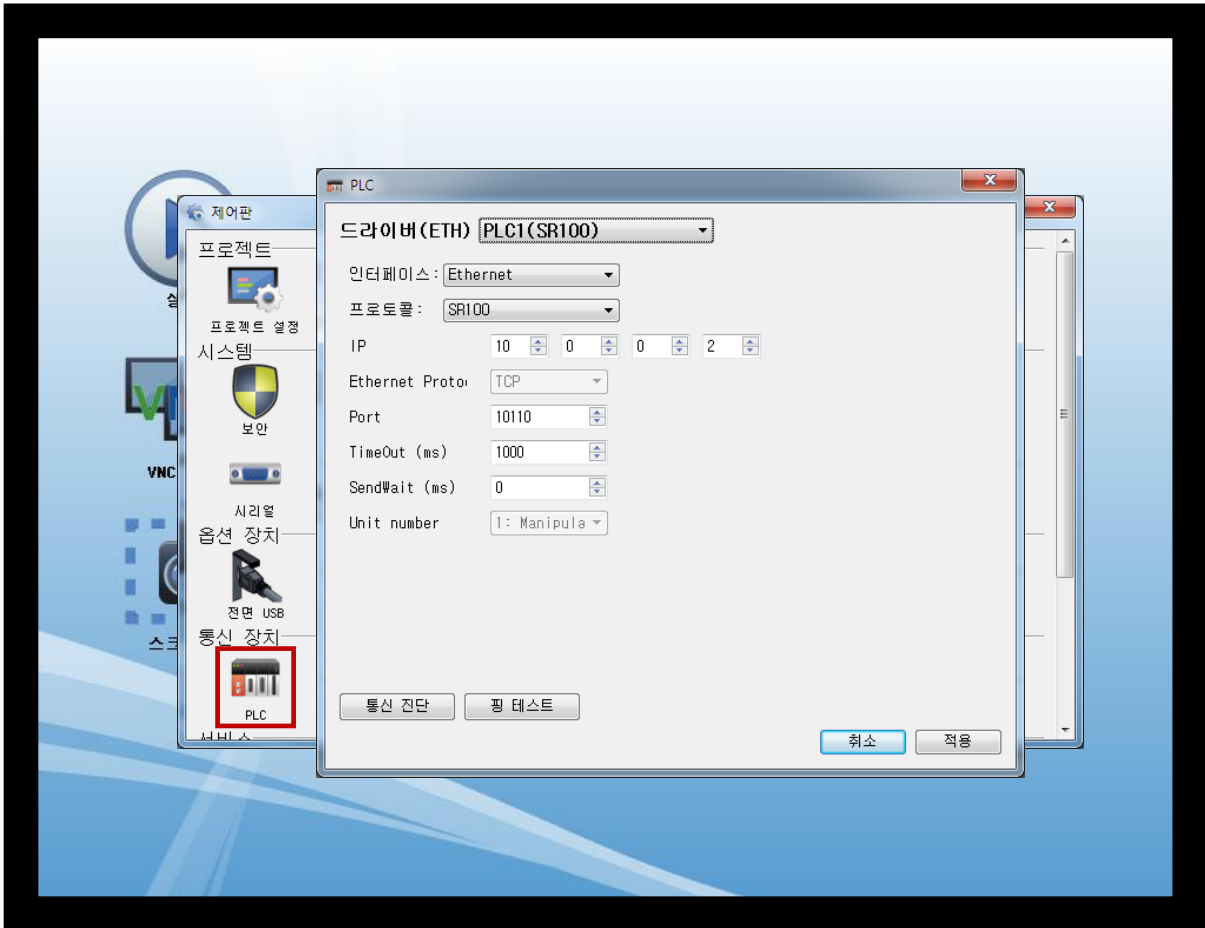
※ 위의 설정 내용은 본 사에서 권장하는 예제입니다.

항 목	설 명
IP 주소	네트워크 상에서 TOP가 사용 할 IP 주소를 설정합니다.
서브넷 마스크	네트워크의 서브넷 마스크를 입력합니다.
게이트 웨이	네트워크의 게이트 웨이를 입력합니다.



(2) 통신 옵션 설정

■ [ 메인 화면 > 제어판 > PLC ]



항 목	설 정	비 고
인터페이스	"Ethernet"을 선택합니다.	<a href="#">"2. 외부 장치 선택" 참고</a>
프로토콜	"SR100"을 선택합니다.	
IP	외부 장치의 IP 주소를 입력 합니다.	
Ethernet Protocol	TOP - 외부 장치 간 이더넷 프로토콜을 선택합니다.	고정
Port	외부 장치의 이더넷 통신 포트 번호를 입력합니다.	고정
TimeOut (ms)	TOP가 외부 장치로부터 응답을 기다리는 시간을 설정합니다.	
SendWait (ms)	TOP가 외부 장치로부터 응답 수신 후 다음 명령어 요청 전송 간에 대기 시간을 설정합니다.	
Unit number	1: Manipulator, 2: Pre-aligner 해당하는 Unit number를 설정합니다.	

### 3.3 통신 진단

■ TOP – 외부 장치 간 인터페이스 설정 상태를 확인

- TOP 화면 상단을 터치하여 아래로 드래그. 팝업 창의 "EXIT"를 터치하여 메인 화면으로 이동한다
- [ 제어판 > 이더넷 ] 에서 사용 하고자 하는 ETH 포트 설정이 외부 장치의 설정 내용과 같은지 확인한다

■ 포트 통신 이상 유무 진단

- [ 제어판 > PLC ] 에서 "통신 진단"을 터치한다.
- 화면 상에 Diagnostics 다이얼로그 박스가 팝업 되며 진단 상태를 판단한다.

OK	통신 설정 정상
Time Out Error	통신 설정 비정상 - 케이블 및 TOP, 외부 장치의 설정 상태 확인한다. (참조 : 통신 진단 시트 )

■ 통신 진단 시트

- 외부 단말기와 통신 연결에 문제가 있을 경우 아래 시트의 설정 내용을 확인 바랍니다.

항목	내용	확인		참 고	
시스템 구성	시스템 연결 방법	OK	NG	<a href="#">1. 시스템 구성</a>	
	접속 케이블 명칭	OK	NG		
TOP	버전 정보	OK	NG	<a href="#">2. 외부 장치 선택</a> <a href="#">3. 통신 설정</a>	
	사용 포트	OK	NG		
	드라이버 명칭	OK	NG		
	기타 세부 설정 사항	OK	NG		
	상대 국번	프로젝트 설정	OK		NG
		통신 진단	OK		NG
	이더넷 포트 설정	IP 주소	OK		NG
		서브넷 마스크	OK		NG
게이트 웨이		OK	NG		
외부 장치	CPU 명칭	OK	NG	<a href="#">4. 외부 장치 설정</a>	
	통신 포트 명칭(모듈 명)	OK	NG		
	프로토콜(모드)	OK	NG		
	설정 국번	OK	NG		
	기타 세부 설정 사항	OK	NG		
	이더넷 포트 설정	IP 주소	OK		NG
		서브넷 마스크	OK		NG
		게이트 웨이	OK		NG
어드레스 범위 확인		OK	NG	<a href="#">5. 지원 어드레스</a> (자세한 내용은 PLC 제조사의 매뉴얼을 참고 하시기 바랍니다.)	

## 4. 지원 어드레스

TOP에서 사용 가능한 디바이스는 아래와 같습니다.

CPU 모듈 시리즈/타입에 따라 디바이스 범위(어드레스) 차이가 있을 수 있습니다. TOP 시리즈는 외부 장치 시리즈가 사용하는 최대 어드레스 범위를 지원합니다. 사용하고자 하는 장치가 지원하는 어드레스 범위를 벗어 나지 않도록 각 CPU 모듈 사용자 매뉴얼을 참조/주의 하십시오.

### Action Commands

Name	Function	M	P
INIT	Initializes specified unit 지정된 단위를 초기화합니다 • 오류 지우기 • 서보 ON • HOME 위치로 이동	V	V
MTRS	Performs wafer transfer operation (Get operations/Put operations/Exchange operations) 지정된 전송 스테이션에 대한 웨이퍼 전송 (Get / Put / Exchange) 작업을 수행합니다	V	
MPNT	Moves to the specified transfer point. "MTRS" 또는 "MCTR" 명령 실행으로 지정된 전송 스테이션의 전송 지점으로 이동합니다	V	
MCTR	Continued wafer transfer operation + Transfer operation. "MTRS" 또는 "MCTR" 명령 바로 다음에 지정된 웨이퍼 이송 작업이 계속되고, 동작이 완료된 후, 새롭게 특정 된 스테이션의 웨이퍼 이송 동작이 수행됩니다.	V	
MTCH	Moves to the specified position (registered position/ready position). 지정된 전송 스테이션의 지정된 위치로 이동합니다	V	
MABS	Moves the specified axis to a specified coordinate position. 지정된 축을 지정된 좌표 위치로 이동합니다	V	
MREL	Moves the specified axis to the specified relative position. 지정된 축을 현재 위치에서 지정된 상대 위치로 이동합니다	V	V
MMAF	Performs the wafer mapping. 지정된 전송 스테이션에서 웨이퍼 매핑을 수행합니다	V	
MMCA	Performs the mapping calibration. 지정된 카세트 스테이션에 대한 매핑 작업을 수행합니다	V	
MALN	Aligns the wafer on the pre-aligner. pre-aligner에서 웨이퍼를 정렬합니다		V
MACA	Performs alignment calibration. 웨이퍼 정렬을 위한 보정을 수행합니다		V

\* M: Manipulator , P: Pre-aligner

### Control Commands

Name	Function	M	P
CSTP	Applies deceleration/emergency stop to stop the motion. 감속 / 비상 정지를 적용하여 지정된 장치의 동작을 중지합니다	V	V
CRSM	Restarts the motion interrupted by deceleration stop. 감속 정지로 중단 된 모션을 다시 시작합니다	V	V
CSRV	Turns ON/OFF the servo power. 지정한 유닛의 서보 전원을 ON / OFF합니다	V	V
CCLR	Clears the current error or error history. 지정한 단위의 현재 오류 또는 오류 내역을 지웁니다	V	V
CSOL	Performs solenoid operation. 지정한 단위의 솔레노이드에 대한 웨이퍼 홀드 / 해제 신호를 명령합니다	V	V

\* M: Manipulator , P: Pre-aligner



## Setting Commands

Name	Function	M	P
SSPD	Sets the motion speed. 동작 속도 (노 - 웨이퍼 이송 속도, 웨이퍼 - 이송 속도, 저속 이송 속도, 원점 복귀 속도, 저속 영역 속도)를 설정합니다	V	V
SSLV	Selects the transfer speed level. 속도 레벨 (웨이퍼 없음, 웨이퍼 내 전송 속도, 저속 전송 속도, 원점 복귀 속도, 저속 영역 속도)를 설정합니다	V	V
SPOS	Registers the current position as the specified transfer station. 지정된 단위의 현재 위치를 지정된 전송 스테이션으로 등록합니다	V	
SABS	Registers the specified coordinate position as the specified transfer station. 지정된 단위의 지정된 전송 스테이션으로 좌표 위치를 등록합니다	V	
SAPS	Modifies the specified transfer station's registered position by the adjustment offset. 지정된 전송 스테이션의 티칭 위치를 조정합니다	V	
SPDL	Deletes the specified transfer station's registered position. 지정된 유닛의 지정된 전송 스테이션의 등록 된 위치를 삭제합니다	V	
SPSV	Registers the position data in the volatile memory to the non-volatile memory. 휘발성 메모리의 위치 데이터를 비 휘발성 메모리에 등록합니다	V	
SPLD	Reads the position data in the non-volatile memory into the volatile memory. 비 휘발성 메모리의 위치 데이터를 휘발성 메모리로 읽습니다	V	
SSTR	Sets the station's information parameters. 전송 스테이션 정보를 설정합니다	V	
SPRM	Changes the parameter values. 지정된 단위의 지정된 매개 변수 값이 변경됩니다	V	V
SMSK	Enables or disables the interlock monitoring function. 인터록 신호 모니터링 기능을 활성화 또는 비활성화합니다	V	V
SSTD	Registers the current position as the manipulator coordinate's reference position. 현재 위치는 조작자 좌표의 기준 위치로 등록됩니다 이 명령은 위치를 비 휘발성 메모리에 등록합니다	V	
SSTN	Registers the specified number as a reference position. 기준 위치 인코더 값을 지정하고 기준 위치를 기록하십시오 이 명령은 위치를 비 휘발성 메모리에 등록합니다	V	

\* M: Manipulator , P: Pre-aligner

## Reference Commands

Name	Function	M	P
RSPD	References the motion speed. 지정된 단위의 축의 동작 속도 설정을 나타냅니다. (비 웨이퍼 속도, 웨이퍼 속도, 저속, 원점 복귀 속도, 저속 영역 속도) 이 명령은 휘발성 메모리의 기본 속도 설정을 나타냅니다	V	V
RSLV	References the current transfer speed level. 현재 설정된 전송 속도의 속도 수준을 참조하십시오 (웨이퍼 없음 속도, 웨이퍼 속도, 낮음속도, 원점 복귀 속도, 저속 영역 속도)를 설정합니다 컨트롤러 전원이 순환되면 높은 속도 프로필이 선택됩니다 (기본값).	V	V
RPOS	References the current position. 지정된 단위의 현재 위치 참조	V	
RSTP	References the registered position. 지정된 단위의 등록 된 위치 참조	V	
RSTR	References the station information. stations information 참조	V	
RPRM	References the parameter value. 지정된 단위의 매개 변수 값 참조	V	V



RSTS	References the units' statuses. <b>various statuses 참조</b>	V	V
RERR	References the error history. <b>지정된 장치의 오류 기록 참조</b>	V	V
RMSK	References the current interlock monitor settings. <b>Interlock Monitoring 정보 참조</b>	V	V
RVER	References the software version. <b>software version 참조</b>	V	V
RMAP	References the specified transfer station's mapping results. <b>지정된 전송 스테이션의 매핑 결과 참조</b>	V	
RMPD	References the mapping data (elevation axis coordinates during sensor edge startup/stopping). <b>매핑 데이터를 참조합니다 (센서 에지 시작 / 정지 중 고도 측 좌표 값)</b> <b>지정된 전송 스테이션에 대한 매핑이 실행됩니다</b>	V	
RMCA	References the mapping calibration result. <b>Mapping 보정 결과 참조</b>	V	
RALN	References the alignment result. <b>정렬 결과 참조</b>		V
RACA	References the calibration results for alignment. <b>정렬 교정 결과 참조</b>		V
RCCD	References the pre-aligner's light amount and CCD data. <b>pre-aligner 광량 및 CCD 센서 값 참조</b>		V
RLOG	References the log data. <b>지정된 로그 정보 참조</b>	V	V
RSTN	References the reference position record. <b>참조 위치 참조</b>	V	

\* M: Manipulator , P: Pre-aligner



## Status

	Value	Status	Meaning
Sts1 (SYS:1000)	Bit0	Manipulator Battery status	The battery voltage status of the specified absolute encoder 1: Low battery voltage, 0: Normal state
	Bit1	Unit status	The command execution status of a drive/control command of the specified unit 1: Ready, 0: Busy
	Bit2	Servo status	The servo status of the specified unit 1: Servo OFF, 0: Servo ON
	Bit3	Servo status	Error status of the specified unit 1: Error occurrence, 0: No error occurrence
Sts2 (SYS:1001)	Bit0	controller battery status	Low voltage of memory backup battery 1: Battery voltage dropped, 0: Normal status
	Bit1	Wafer presence Status 1	For a manipulator, shows whether there is a wafer on blade 1. For a pre-aligner, shows the wafer presence status from the vacuum sensor. (1: Has wafer, 0: No wafer)
	Bit2	Wafer presence Status 2	For a manipulator, shows whether there is a wafer on blade 2. For a pre-aligner, shows the wafer presence status from the CCD sensor. (1: Has wafer, 0: No wafer)
	Bit3	Reserve	

## INIT (Unit initialization)

지정된 단위를 초기화합니다

### [Conditions]

- The specified unit is under ready state. ( 지정된 장치가 준비 상태에 있습니다)

Address(SYS)	001002	001003	001004
Info	Error clear Yes/No (1 byte) • 오류 지우기	Servo ON Yes/No (1 byte) • 서보 ON	Axes that move to home position (1 byte) • HOME 위치로 이동
Type	BIT	BIT	BIT
Value	Bit0 : No error clear. Bit1 : Error clear.	Bit0 : No Servo ON. Bit1 : Servo ON.	<Manipulator> Bit0 : All axes. Bit1 : Arm axes only. Bit2 : No axes move to home position. <Pre-aligner> Bit2 : Fixed value. (Vacuum type pre-aligners do not need to move to the home position)

- T.P.'s mode selector switch is set to Host mode (if T.P. is connected)

Address(PLC)	INIT_CMD
Info	Execute command after write operation

### Message for the End-of-Execution

Address(SYS)	1300 ~ 1308																								
Info	Update values after command execution																								
Type	DEC(32Bit)																								
Value	<p>Coordinate data Responds with the feedback position at the end of execution. (Resolution: 0.001 [deg] or 0.001 [mm])</p> <ul style="list-style-type: none"> <li>Specified in the range between "-9999999" and "99999999"</li> <li>If value is less than 8 digits, fill the higher digit with '0' so that the field always has 8 digits.</li> <li>Responds with the specified unit's axis count part.</li> </ul> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Unit</th> <th>Coordinate data</th> <th>Axis</th> <th>Unit</th> </tr> </thead> <tbody> <tr> <td rowspan="5">Manipulator</td> <td>PosData1</td> <td>Rotation axis</td> <td>0.001 [deg]</td> </tr> <tr> <td>PosData2</td> <td>Extension axis</td> <td>0.001 [mm]</td> </tr> <tr> <td>PosData3</td> <td>Wrist axis 1</td> <td>0.001 [deg]</td> </tr> <tr> <td>PosData4</td> <td>Wrist axis 2</td> <td>0.001 [deg]</td> </tr> <tr> <td>PosData5</td> <td>Elevation axis</td> <td>0.001 [mm]</td> </tr> <tr> <td>Pre-aligner</td> <td>PosData1</td> <td colspan="2">Rotation axis (*1)</td> </tr> </tbody> </table> <p>(*1) If the specified unit is a pre-aligner, be sure to respond with "00000000".</p>	Unit	Coordinate data	Axis	Unit	Manipulator	PosData1	Rotation axis	0.001 [deg]	PosData2	Extension axis	0.001 [mm]	PosData3	Wrist axis 1	0.001 [deg]	PosData4	Wrist axis 2	0.001 [deg]	PosData5	Elevation axis	0.001 [mm]	Pre-aligner	PosData1	Rotation axis (*1)	
Unit	Coordinate data	Axis	Unit																						
Manipulator	PosData1	Rotation axis	0.001 [deg]																						
	PosData2	Extension axis	0.001 [mm]																						
	PosData3	Wrist axis 1	0.001 [deg]																						
	PosData4	Wrist axis 2	0.001 [deg]																						
	PosData5	Elevation axis	0.001 [mm]																						
Pre-aligner	PosData1	Rotation axis (*1)																							

## MTRS (Perform wafer transfer operation (Get/Put/Exchange operations))

지정된 전송 스테이션에 대한 웨이퍼 전송 (Get / Put / Exchange) 작업을 수행하십시오

각 축은 다음 순서로 이동합니다.

- (1) 웨이퍼가 있는지 확인하십시오.
  - (2) 안전 경로를 통해 팔을 최소 스윙 자세로 이동시킵니다.
  - (3) 지정된 조정 오프셋으로 준비 위치로 이동합니다.
  - (4) 지정된 조정 오프셋을 사용하여 웨이퍼 전송 작업 (Get / Put / Exchange)을 수행합니다
- 동작 순서는 "(6 전송 점 생성 및 모션 패스"를 참조하십시오.

노트)

### [Conditions]

- The specified unit is under ready state.( 지정된 장치가 준비 상태에 있습니다)
- The specified unit is under servo ON state.( 지정된 유닛이 서보 ON 상태입니다)
- T.P.'s mode selector switch is set to Host mode (if T.P. is connected).( T.P.의 모드 선택기 스위치가 호스트 모드로 설정됩니다 (T.P.가 연결된 경우))
- The specified transfer station has been registered.( 지정된 전송 스테이션이 등록되었습니다)

지정된 전송 스테이션에 대한 웨이퍼 전송 (Get / Put / Exchange) 작업을 수행

Address(SYS)	001005	001006	001008
Info	Motion mode (1 byte)	Transfer station (3 bytes)	Slot number (2 bytes)
Type	BIT	ASCII	DEC(16Bit)
Value	<ul style="list-style-type: none"> <li>• Bit0 : Get motion.</li> <li>• Bit1 : Put motion.</li> <li>• Bit2 : Exchange motion.</li> </ul>	<ul style="list-style-type: none"> <li>• "C01" - "C08" : Cassette stage.</li> <li>• "S01" - "S12" : Transfer stage.</li> <li>• "P01" : P/A stage.</li> </ul>	<p>&lt;Cassette stage&gt;</p> <ul style="list-style-type: none"> <li>• "01" - "30" : When cassette stage specified.</li> </ul> <p>&lt;Transfer stage, Pre-aligner stage&gt;</p> <ul style="list-style-type: none"> <li>• "00" : Fixed slot(because this type of station does not have multiple slots.).</li> </ul> <p>Note) If value is less than 2 digits, fill the higher digit with '0' so that the field always has 2 digits. Note) If &lt;Hand&gt; is 'F'(Blade 1 + Blade 2), specifies the slot accessed by Blade 1.</p>

Address(SYS)	001009	001010	001011
Info	Arm Posture (1 byte)	Blade (1 byte)	Transfer point (2 bytes)
Type	BIT	BIT	ASCII
Value	<ul style="list-style-type: none"> <li>• Bit0 : Left elbow.</li> <li>• Bit1 : Right elbow.</li> <li>• Bit2 : Automatic (Automatically selected posture with the proper path).</li> </ul>	<ul style="list-style-type: none"> <li>• Bit0: Blade 1.</li> <li>• Bit1 : Blade 2.</li> <li>• Bit2 : Blade 1 + Blade 2 (WGet/WPut operation).</li> </ul> <p>Note) Except for &lt;TrsPnt&gt; is [C01-C08: Cassette stage], 'F'(Blade 1 + Blade 2) cannot be specified. Note) If &lt;Mtn&gt; is 'E'( Exchange motion), 'F'(Blade 1 + Blade 2) cannot be specified.</p>	<ul style="list-style-type: none"> <li>• "G1" - "G8", "Gb" : Get transfer point.</li> <li>• "P1" - "P8", "Pb" : Put transfer point.</li> </ul> <p>Note) If &lt;Mtn&gt; is 'G'(Get motion),"P1"- "P8","Pb"(Put transfer point) cannot be specified. Note) If &lt;Mtn&gt; is 'P'(Put motion), "G1"- "G8", "Gb"(Get transfer point) cannot be specified.</p>



Address(SYS)	1200	1201 ~ 1206	1207 ~ 1208
Info	Use/Not Use	XYZ direction offset (None / 8 bytes each, Resolution: 0.001 [mm])	Positioning angle (None / 8 bytes, Resolution: 0.001 [deg])
Type	BIT	DEC(32Bit)	DEC(32Bit)
Value	<ul style="list-style-type: none"> <li>• Bit0: XYZ direction adjustment offset omitted</li> <li>• Bit1 Positioning angle omitted</li> <li>• Bit2 : Nothing omitted</li> </ul>	<ul style="list-style-type: none"> <li>• OfstX : X direction offset.</li> <li>• OfstY : Y direction offset .</li> <li>• OfstZ : Z direction offset.</li> </ul> <p>Note) Specified in the range between "-0009999" and "00009999".</p> <p>If a value is less than the specified digits, fill the higher digit(s) with '0' so that the field always has specified digits.</p> <p>A sign is added to the highest digit.</p> <p>Note) Ignored during Exchange operations.</p> <p>Note) For the XYZ direction adjustment offset, &lt;OfstX&gt;, &lt;OfstY&gt;, &lt;OfstZ&gt; can be omitted together.</p>	<p>Note) Relative angle from the position set by alignment calibration.</p> <p>Note) Specified in the range between "00000000" and "00359999".</p> <p>If a value is less than the specified digits, fill the higher digit(s) with '0' so that the field always has specified digits.</p> <p>Note) Only effective for a Put motion to the pre-aligner stage (Ignored otherwise).</p> <p>If omitted for a Put motion to the pre-aligner stage, the alignment operation will not be performed.</p>

Address(PLC)	MTRS_CMD
Info	Execute command after write operation

**Message for the End-of-Execution**

Address(SYS)	1300 ~ 1308																								
Info	Update values after command execution																								
Type	DEC(32Bit)																								
Value	<p>Coordinate data</p> <p>Responds with the feedback position at the end of execution. (Resolution: 0.001 [deg] or 0.001 [mm])</p> <ul style="list-style-type: none"> <li>• Specified in the range between "-9999999" and "99999999"</li> <li>• If value is less than 8 digits, fill the higher digit with '0' so that the field always has 8 digits.</li> <li>• Responds with the specified unit's axis count part.</li> </ul> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Unit</th> <th style="text-align: center;">Coordinate data</th> <th style="text-align: center;">Axis</th> <th style="text-align: center;">Unit</th> </tr> </thead> <tbody> <tr> <td rowspan="5" style="text-align: center;">Manipulator</td> <td style="text-align: center;">PosData1</td> <td style="text-align: center;">Rotation axis</td> <td style="text-align: center;">0.001 [deg]</td> </tr> <tr> <td style="text-align: center;">PosData2</td> <td style="text-align: center;">Extension axis</td> <td style="text-align: center;">0.001 [mm]</td> </tr> <tr> <td style="text-align: center;">PosData3</td> <td style="text-align: center;">Wrist axis 1</td> <td style="text-align: center;">0.001 [deg]</td> </tr> <tr> <td style="text-align: center;">PosData4</td> <td style="text-align: center;">Wrist axis 2</td> <td style="text-align: center;">0.001 [deg]</td> </tr> <tr> <td style="text-align: center;">PosData5</td> <td style="text-align: center;">Elevation axis</td> <td style="text-align: center;">0.001 [mm]</td> </tr> <tr> <td style="text-align: center;">Pre-aligner</td> <td style="text-align: center;">PosData1</td> <td colspan="2" style="text-align: center;">Rotation axis (*1)</td> </tr> </tbody> </table> <p>(*1) If the specified unit is a pre-aligner, be sure to respond with "00000000".</p>	Unit	Coordinate data	Axis	Unit	Manipulator	PosData1	Rotation axis	0.001 [deg]	PosData2	Extension axis	0.001 [mm]	PosData3	Wrist axis 1	0.001 [deg]	PosData4	Wrist axis 2	0.001 [deg]	PosData5	Elevation axis	0.001 [mm]	Pre-aligner	PosData1	Rotation axis (*1)	
Unit	Coordinate data	Axis	Unit																						
Manipulator	PosData1	Rotation axis	0.001 [deg]																						
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	PosData5	Elevation axis	0.001 [mm]																						
Pre-aligner	PosData1	Rotation axis (*1)																							

## MPNT (Motion between Transfer Points)

"MTRS" 또는 "MCTR" 명령 실행으로 지정된 전송 스테이션의 전송 지점으로 이동합니다

### [Conditions]

- The specified unit is under ready state.(지정된 장치가 준비 상태에 있습니다.)
- The specified unit is under servo ON state.(지정된 유닛이 서보 ON 상태입니다.)
- T.P.'s mode selector switch is set to Host mode (if T.P. is connected).( T.P.의 모드 선택기 스위치가 호스트 모드로 설정됩니다 (T.P.가 연결된 경우).)
- The action command immediately before this command has to be successfully completed "MTRS" command or "MCTR command"/"MPNT command".( 이 명령이 실행되기 직전의 동작 명령은 "MTRS" 명령 또는 "MCTR 명령" / "MPNT 명령")

Address(SYS)	001012
Info	Transfer point (2 bytes)
Type	ASCII(2)
Value	<ul style="list-style-type: none"> <li>• "G1" - "G8", "Gb" : Get transfer point.</li> <li>• "P1" - "P8", "Pb" : Put transfer point.</li> <li>• "AL" : Final point (For Get motion: G4, for Put/Exg motion: P4).</li> <li>• "ST" : Step operation (Move to next transfer point).</li> </ul> <p>Note) If &lt;Mtn&gt; is 'G'(Get motion), "P1"- "P8", "Pb"(Put transfer point) cannot be specified.                      Note) If &lt;Mtn&gt; is 'P'(Put motion), "G1"- "G8", "Gb"(Get transfer point) cannot be specified.</p>

Address(PLC)	MPNT_CMD
Info	Execute command after write operation

### Message for the End-of-Execution

Address(SYS)	1300 ~ 1308																								
Info	Update values after command execution																								
Type	DEC(32Bit)																								
Value	<p>Coordinate data                      Responds with the feedback position at the end of execution. (Resolution: 0.001 [deg] or 0.001 [mm])</p> <ul style="list-style-type: none"> <li>• Specified in the range between "-9999999" and "99999999"</li> <li>• If value is less than 8 digits, fill the higher digit with '0' so that the field always has 8 digits.</li> <li>• Responds with the specified unit's axis count part.</li> </ul> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="width: 25%;">Unit</th> <th style="width: 25%;">Coordinate data</th> <th style="width: 25%;">Axis</th> <th style="width: 25%;">Unit</th> </tr> </thead> <tbody> <tr> <td rowspan="5">Manipulator</td> <td>PosData1</td> <td>Rotation axis</td> <td>0.001 [deg]</td> </tr> <tr> <td>PosData2</td> <td>Extension axis</td> <td>0.001 [mm]</td> </tr> <tr> <td>PosData3</td> <td>Wrist axis 1</td> <td>0.001 [deg]</td> </tr> <tr> <td>PosData4</td> <td>Wrist axis 2</td> <td>0.001 [deg]</td> </tr> <tr> <td>PosData5</td> <td>Elevation axis</td> <td>0.001 [mm]</td> </tr> <tr> <td>Pre-aligner</td> <td>PosData1</td> <td colspan="2">Rotation axis (*1)</td> </tr> </tbody> </table> <p>(*1) If the specified unit is a pre-aligner, be sure to respond with "00000000".</p>	Unit	Coordinate data	Axis	Unit	Manipulator	PosData1	Rotation axis	0.001 [deg]	PosData2	Extension axis	0.001 [mm]	PosData3	Wrist axis 1	0.001 [deg]	PosData4	Wrist axis 2	0.001 [deg]	PosData5	Elevation axis	0.001 [mm]	Pre-aligner	PosData1	Rotation axis (*1)	
Unit	Coordinate data	Axis	Unit																						
Manipulator	PosData1	Rotation axis	0.001 [deg]																						
	PosData2	Extension axis	0.001 [mm]																						
	PosData3	Wrist axis 1	0.001 [deg]																						
	PosData4	Wrist axis 2	0.001 [deg]																						
	PosData5	Elevation axis	0.001 [mm]																						
Pre-aligner	PosData1	Rotation axis (*1)																							

## MCTR (Continued wafer transfer operation + Transfer operation)

"MTRS"또는 "MCTR"명령 바로 다음에 지정된 웨이퍼 이송 작업이 계속되고, 동작이 완료된 후, 새롭게 특정 된 스테이션의 웨이퍼 이송 동작이 수행됩니다.

### [Conditions]

- The specified unit is under ready state.( 지정된 장치가 준비 상태에 있습니다.)
- The specified unit is under servo ON state.( 지정된 유닛이 서보 ON 상태입니다)
- T.P.'s mode selector switch is set to Host mode (if T.P. is connected).( T.P.의 모드 선택기 스위치가 호스트 모드로 설정됩니다 (T.P.가 연결된 경우).)
- The specified transfer station has been registered.( 지정된 전송 스테이션이 등록되었습니다)
- The action command immediately before this command has to be a successfully completed "MTRS", "MCTR", or "MPNT" command.( 이 명령이 실행되기 직전의 action 명령은 성공적으로 완료된 "MTRS"이어야합니다. "MCTR"또는 "MPNT"명령)

Address(SYS)	001013	001014	001016
Info	Motion mode (1 byte)	Transfer station (3 bytes)	Slot number (2 bytes)
Type	BIT	ASCII(3)	DEC(16Bit)
Value	<ul style="list-style-type: none"> <li>• Bit0 : Get motion.</li> <li>• Bit1 : Put motion.</li> <li>• Bit2 : Exchange motion.</li> </ul>	<ul style="list-style-type: none"> <li>• "C01" - "C08" : Cassette stage.</li> <li>• "S01" - "S12" : Transfer stage.</li> <li>• "P01" : P/A stage.</li> </ul>	<p>&lt;Cassette stage&gt;</p> <ul style="list-style-type: none"> <li>• "01" - "30" : When cassette stage specified.</li> </ul> <p>&lt;Transfer stage, Pre-aligner stage&gt;</p> <ul style="list-style-type: none"> <li>• "00" : Fixed slot(because this type of station does not have multiple slots.).</li> </ul> <p>Note) If value is less than 2 digits, fill the higher digit with '0' so that the field always has 2 digits.</p> <p>Note) If &lt;Hand&gt; is 'F'(Blade 1 + Blade 2), specifies the slot accessed by Blade 1.</p>

Address(SYS)	001017	001018	001019
Info	Arm Posture (1 byte)	Blade (1 byte)	Transfer point (2 bytes)
Type	BIT	BIT	ASCII(3)
Value	<ul style="list-style-type: none"> <li>• Bit0 : Left elbow.</li> <li>• Bit1 : Right elbow.</li> <li>• Bit2 : Automatic (Automatically selected posture with the proper path).</li> </ul>	<ul style="list-style-type: none"> <li>• Bit0 : Blade 1.</li> <li>• Bit1 : Blade 2.</li> <li>• Bit2 : Blade 1 + Blade 2 (WGet/WPut operation).</li> </ul> <p>Note) Except for &lt;TrsPnt&gt; is [C01-C08: Cassette stage], 'F'(Blade 1 + Blade 2) cannot be specified.</p> <p>Note) If &lt;Mtn&gt; is 'E'( Exchange motion), 'F'(Blade 1 + Blade 2) cannot be specified.</p>	<ul style="list-style-type: none"> <li>• "G1" - "G8", "Gb" : Get transfer point.</li> <li>• "P1" - "P8", "Pb" : Put transfer point.</li> </ul> <p>Note) If &lt;Mtn&gt; is 'G'(Get motion),"P1"- "P8","Pb"(Put transfer point) cannot be specified.</p> <p>Note) If &lt;Mtn&gt; is 'P'(Put motion), "G1"- "G8", "Gb"(Get transfer point) cannot be specified.</p>



Address(SYS)	1209	1210 ~ 1215	1216 ~ 1217
Info	Use/Not Use	XYZ direction offset (None / 8 bytes each, Resolution: 0.001 [mm])	Positioning angle (None / 8 bytes, Resolution: 0.001 [deg])
Type	BIT	DEC(32Bit)	DEC(32Bit)
Value	<ul style="list-style-type: none"> <li>• Bit0: XYZ direction adjustment offset omitted</li> <li>• Bit1 Positioning angle omitted</li> <li>• Bit2 : Nothing omitted</li> </ul>	<ul style="list-style-type: none"> <li>• OfstX : X direction offset.</li> <li>• OfstY : Y direction offset .</li> <li>• OfstZ : Z direction offset.</li> </ul> <p>Note) Specified in the range between "-0009999" and "00009999".</p> <p>If a value is less than the specified digits, fill the higher digit(s) with '0' so that the field always has specified digits.</p> <p>A sign is added to the highest digit.</p> <p>Note) Ignored during Exchange operations.</p> <p>Note) For the XYZ direction adjustment offset, &lt;OfstX&gt;, &lt;OfstY&gt;, &lt;OfstZ&gt; can be omitted together.</p>	<p>Note) Relative angle from the position set by alignment calibration.</p> <p>Note) Specified in the range between "00000000" and "00359999".</p> <p>If a value is less than the specified digits, fill the higher digit(s) with '0' so that the field always has specified digits.</p> <p>Note) Only effective for a Put motion to the pre-aligner stage (Ignored otherwise).</p> <p>If omitted for a Put motion to the pre-aligner stage, the alignment operation will not be performed.</p>

Address(PLC)	MCTR_CMD
Info	Execute command after write operation

**Message for the End-of-Execution**

Address(SYS)	1300 ~ 1308																								
Info	Update values after command execution																								
Type	DEC(32Bit)																								
Value	<p>Coordinate data</p> <p>Responds with the feedback position at the end of execution. (Resolution: 0.001 [deg] or 0.001 [mm])</p> <ul style="list-style-type: none"> <li>• Specified in the range between "-9999999" and "99999999"</li> <li>• If value is less than 8 digits, fill the higher digit with '0' so that the field always has 8 digits.</li> <li>• Responds with the specified unit's axis count part.</li> </ul> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 25%;">Unit</th> <th style="width: 25%;">Coordinate data</th> <th style="width: 25%;">Axis</th> <th style="width: 25%;">Unit</th> </tr> </thead> <tbody> <tr> <td rowspan="5" style="text-align: center;">Manipulator</td> <td style="text-align: center;">PosData1</td> <td style="text-align: center;">Rotation axis</td> <td style="text-align: center;">0.001 [deg]</td> </tr> <tr> <td style="text-align: center;">PosData2</td> <td style="text-align: center;">Extension axis</td> <td style="text-align: center;">0.001 [mm]</td> </tr> <tr> <td style="text-align: center;">PosData3</td> <td style="text-align: center;">Wrist axis 1</td> <td style="text-align: center;">0.001 [deg]</td> </tr> <tr> <td style="text-align: center;">PosData4</td> <td style="text-align: center;">Wrist axis 2</td> <td style="text-align: center;">0.001 [deg]</td> </tr> <tr> <td style="text-align: center;">PosData5</td> <td style="text-align: center;">Elevation axis</td> <td style="text-align: center;">0.001 [mm]</td> </tr> <tr> <td style="text-align: center;">Pre-aligner</td> <td style="text-align: center;">PosData1</td> <td colspan="2" style="text-align: center;">Rotation axis (*1)</td> </tr> </tbody> </table> <p>(*1) If the specified unit is a pre-aligner, be sure to respond with "00000000".</p>	Unit	Coordinate data	Axis	Unit	Manipulator	PosData1	Rotation axis	0.001 [deg]	PosData2	Extension axis	0.001 [mm]	PosData3	Wrist axis 1	0.001 [deg]	PosData4	Wrist axis 2	0.001 [deg]	PosData5	Elevation axis	0.001 [mm]	Pre-aligner	PosData1	Rotation axis (*1)	
Unit	Coordinate data	Axis	Unit																						
Manipulator	PosData1	Rotation axis	0.001 [deg]																						
	PosData2	Extension axis	0.001 [mm]																						
	PosData3	Wrist axis 1	0.001 [deg]																						
	PosData4	Wrist axis 2	0.001 [deg]																						
	PosData5	Elevation axis	0.001 [mm]																						
Pre-aligner	PosData1	Rotation axis (*1)																							

## MTCH (Move to Registered Position)

지정된 전송 스테이션의 지정된 위치로 이동합니다

### [Conditions]

- The specified unit is under ready state.( 지정된 장치가 준비 상태에 있습니다)
- The specified unit is under servo ON state.( 지정된 유닛이 서보 ON 상태입니다)
- T.P.'s mode selector switch is set to Host mode (if T.P. is connected).( T.P.의 모드 선택기 스위치가 호스트 모드로 설정됩니다 (T.P.가 연결된 경우).)
- The specified transfer station has been registered.( 지정된 전송 스테이션이 등록되었습니다)

Address(SYS)	001020	001022
Info	Transfer station (3 bytes)	Slot number (2 bytes)
Type	ASCII(3)	DEC(16Bit)
Value	<ul style="list-style-type: none"> <li>• "C01" - "C08" : Cassette stage.</li> <li>• "S01" - "S12" : Transfer stage.</li> <li>• "P01" : P/A stage.</li> </ul>	<p>&lt;Cassette stage&gt;</p> <ul style="list-style-type: none"> <li>• "01" - "30" : When cassette stage specified.</li> </ul> <p>&lt;Transfer stage, Pre-aligner stage&gt;</p> <ul style="list-style-type: none"> <li>• "00" : Fixed slot(because this type of station does not have multiple slots.).</li> </ul> <p>Note) If value is less than 2 digits, fill the higher digit with '0' so that the field always has 2 digits.</p> <p>Note) If &lt;Hand&gt; is 'F'(Blade 1 + Blade 2), specifies the slot accessed by Blade 1.</p>

Address(SYS)	001023	001024
Info	Arm Posture (1 byte)	Blade (1 byte)
Type	BIT	BIT
Comment	<ul style="list-style-type: none"> <li>• Bit0 : Left elbow.</li> <li>• Bit1 : Right elbow.</li> <li>• Bit2 : Automatic (Automatically selected posture with the proper path).</li> </ul>	<ul style="list-style-type: none"> <li>• Bit0 : Blade 1.</li> <li>• Bit1 : Blade 2.</li> <li>• Bit2 : Blade 1 + Blade 2 (WGet/WPut operation).</li> </ul> <p>Note) Except for &lt;TrsPnt&gt; is [C01-C08: Cassette stage], 'F'(Blade 1 + Blade 2) cannot be specified.</p> <p>Note) If &lt;Mtn&gt; is 'E'( Exchange motion), 'F'(Blade 1 + Blade 2) cannot be specified.</p>

Address(SYS)	001025
Info	Position mode (1 byte)
Type	BIT
Comment	<ul style="list-style-type: none"> <li>• Bit0 : Intermediate position (position with XYZ direction offset value applied).</li> <li>• Bit1 : Ready position (position with XYZ direction offset value applied).</li> <li>• 'Bit2 : Offset position (position with XYZ direction offset values applied).</li> <li>• 'Bit3 : Registered position.</li> <li>• 'Bit4 : Mapping start position.</li> <li>• 'Bit5 : Mapping finish position.</li> </ul> <p>Note) For mapping start/finish positions, slot number and blade specifications are ignored. Blades with mapping sensors equipped will operate.</p> <p>Note) The mapping start/finish position is shown in "Figure 6.3 Positions Related to Mapping Operation"</p>



Address(SYS)	1218	1219 ~ 1225
Info	Use/Not Use	XYZ direction offset (None / 8 bytes each, Resolution: 0.001 [mm])
Type	BIT	DEC(32Bit)
Value	<ul style="list-style-type: none"> <li>Bit0: XYZ direction adjustment offset omitted</li> </ul>	<ul style="list-style-type: none"> <li>OfstX : X direction offset.</li> <li>OfstY : Y direction offset .</li> <li>OfstZ : Z direction offset.</li> </ul> <p>Note) Specified in the range between "-0009999" and "00009999". If a value is less than the specified digits, fill the higher digit(s) with '0' so that the field always has specified digits. A sign is added to the highest digit. Note) Ignored during Exchange operations. Note) For the XYZ direction adjustment offset, &lt;OfstX&gt;, &lt;OfstY&gt;, &lt;OfstZ&gt; can be omitted together.</p>

Address(PLC)	MTCH_CMD
Info	Execute command after write operation

**Message for the End-of-Execution**

Address(SYS)	1300 ~ 1308																								
Info	Update values after command execution																								
Type	DEC(32Bit)																								
Value	<p>Coordinate data Responds with the feedback position at the end of execution. (Resolution: 0.001 [deg] or 0.001 [mm])</p> <ul style="list-style-type: none"> <li>Specified in the range between "-9999999" and "99999999"</li> <li>If value is less than 8 digits, fill the higher digit with '0' so that the field always has 8 digits.</li> <li>Responds with the specified unit's axis count part.</li> </ul> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="width: 25%;">Unit</th> <th style="width: 25%;">Coordinate data</th> <th style="width: 25%;">Axis</th> <th style="width: 25%;">Unit</th> </tr> </thead> <tbody> <tr> <td rowspan="5">Manipulator</td> <td>PosData1</td> <td>Rotation axis</td> <td>0.001 [deg]</td> </tr> <tr> <td>PosData2</td> <td>Extension axis</td> <td>0.001 [mm]</td> </tr> <tr> <td>PosData3</td> <td>Wrist axis 1</td> <td>0.001 [deg]</td> </tr> <tr> <td>PosData4</td> <td>Wrist axis 2</td> <td>0.001 [deg]</td> </tr> <tr> <td>PosData5</td> <td>Elevation axis</td> <td>0.001 [mm]</td> </tr> <tr> <td>Pre-aligner</td> <td>PosData1</td> <td colspan="2">Rotation axis (*1)</td> </tr> </tbody> </table> <p>(*1) If the specified unit is a pre-aligner, be sure to respond with "00000000".</p>	Unit	Coordinate data	Axis	Unit	Manipulator	PosData1	Rotation axis	0.001 [deg]	PosData2	Extension axis	0.001 [mm]	PosData3	Wrist axis 1	0.001 [deg]	PosData4	Wrist axis 2	0.001 [deg]	PosData5	Elevation axis	0.001 [mm]	Pre-aligner	PosData1	Rotation axis (*1)	
Unit	Coordinate data	Axis	Unit																						
Manipulator	PosData1	Rotation axis	0.001 [deg]																						
	PosData2	Extension axis	0.001 [mm]																						
	PosData3	Wrist axis 1	0.001 [deg]																						
	PosData4	Wrist axis 2	0.001 [deg]																						
	PosData5	Elevation axis	0.001 [mm]																						
Pre-aligner	PosData1	Rotation axis (*1)																							



## MABS (Move to Specified Coordinate Position)

지정된 축을 지정된 좌표 위치로 이동합니다

### [Conditions]

- The specified unit is under ready state.( 지정된 장치가 준비 상태에 있습니다.)
- The specified unit is under servo ON state.( 지정된 유닛이 서보 ON 상태입니다)
- T.P.'s mode selector switch is set to host mode (if T.P. is connected).( T.P.의 모드 선택기 스위치가 호스트 모드로 설정됩니다 (T.P.가 연결된 경우))

Address(SYS)	001026	001027
Info	Axis (1 byte)	Blade (1 byte)
Type	BIT	BIT
Comment	<ul style="list-style-type: none"> <li>• Bit0 : Rotation axis.</li> <li>• Bit1 : Extension axis.</li> <li>• Bit2 : Wrist axis 1.</li> <li>• Bit3 : Wrist axis 2.</li> <li>• Bit4 : Elevation axis.</li> </ul>	<ul style="list-style-type: none"> <li>• '1' : Blade 1.</li> <li>• '2' : Blade 2.</li> </ul> <p>Note) If the &lt;Axis&gt; specification is "A: Extension axis", specify the access blade. If the &lt;Axis&gt; specification is not "A: Extension axis", specify '1'</p>

Address(SYS)	001028	001029
Info	Passive blade operation mode (1 byte)	Value : Coordinate (8 bytes, Resolution: 0.001 [mm]/[deg])
Type	BIT	DEC(32Bit)
Comment	<ul style="list-style-type: none"> <li>• Bit0 : Maintain passive blade posture.</li> <li>• Bit1 : Passive blade fixed to wafer center.</li> </ul> <p>Note) Valid if the &lt;Axis&gt; specification is "A: Extension axis". If the &lt;Axis&gt; specification is not "A: Extension axis", specify 'C'.</p>	<p>Note) Specified in the range between "-9999999" and "9999999". If value is less than 8 digits, fill the higher digit(s) with '0' so that the field always has 8 digits. A sign is added to the highest digit. Note) If the operation range is exceeded a stroke limit error will be notified.</p>

Address(PLC)	MABS_CMD
Info	Execute command after write operation

### Message for the End-of-Execution

Address(SYS)	1300 ~ 1308																								
Info	Update values after command execution																								
Type	DEC(32Bit)																								
Value	<p>Coordinate data Responds with the feedback position at the end of execution. (Resolution: 0.001 [deg] or 0.001 [mm])</p> <ul style="list-style-type: none"> <li>• Specified in the range between "-9999999" and "9999999"</li> <li>• If value is less than 8 digits, fill the higher digit with '0' so that the field always has 8 digits.</li> <li>• Responds with the specified unit's axis count part.</li> </ul> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="width: 25%;">Unit</th> <th style="width: 25%;">Coordinate data</th> <th style="width: 25%;">Axis</th> <th style="width: 25%;">Unit</th> </tr> </thead> <tbody> <tr> <td rowspan="5">Manipulator</td> <td>PosData1</td> <td>Rotation axis</td> <td>0.001 [deg]</td> </tr> <tr> <td>PosData2</td> <td>Extension axis</td> <td>0.001 [mm]</td> </tr> <tr> <td>PosData3</td> <td>Wrist axis 1</td> <td>0.001 [deg]</td> </tr> <tr> <td>PosData4</td> <td>Wrist axis 2</td> <td>0.001 [deg]</td> </tr> <tr> <td>PosData5</td> <td>Elevation axis</td> <td>0.001 [mm]</td> </tr> <tr> <td>Pre-aligner</td> <td>PosData1</td> <td colspan="2">Rotation axis (*1)</td> </tr> </tbody> </table> <p>(*1) If the specified unit is a pre-aligner, be sure to respond with "00000000".</p>	Unit	Coordinate data	Axis	Unit	Manipulator	PosData1	Rotation axis	0.001 [deg]	PosData2	Extension axis	0.001 [mm]	PosData3	Wrist axis 1	0.001 [deg]	PosData4	Wrist axis 2	0.001 [deg]	PosData5	Elevation axis	0.001 [mm]	Pre-aligner	PosData1	Rotation axis (*1)	
Unit	Coordinate data	Axis	Unit																						
Manipulator	PosData1	Rotation axis	0.001 [deg]																						
	PosData2	Extension axis	0.001 [mm]																						
	PosData3	Wrist axis 1	0.001 [deg]																						
	PosData4	Wrist axis 2	0.001 [deg]																						
	PosData5	Elevation axis	0.001 [mm]																						
Pre-aligner	PosData1	Rotation axis (*1)																							



## MREL (Moves to Specified Relative Position)

지정된 축을 현재 위치에서 지정된 상대 위치로 이동합니다

### [Conditions]

- The specified unit is under ready state. ( 지정된 장치가 준비 상태에 있습니다)
- The specified unit is under servo ON state.( 지정된 유닛이 서보 ON 상태입니다)
- T.P.'s mode selector switch is set to Host mode (if T.P. is connected).( T.P.의 모드 선택기 스위치가 호스트 모드로 설정됩니다 (T.P.가 연결된 경우))

Address(SYS)	001031	001032
Info	Axis (1 byte)	Blade (1 byte)
Type	BIT	BIT
Comment	<ul style="list-style-type: none"> <li>• 'S' : Rotation axis.</li> <li>• 'A' : Extension axis.</li> <li>• 'H' : Wrist axis 1.</li> <li>• 'I' : Wrist axis 2.</li> <li>• 'Z' : Elevation axis.</li> </ul>	<ul style="list-style-type: none"> <li>• '1' : Blade 1.</li> <li>• '2' : Blade 2.</li> </ul> <p>Note) If the &lt;Axis&gt; specification is "A: Extension axis", specify the access blade. If the &lt;Axis&gt; specification is not "A: Extension axis", specify '1'</p>

Address(SYS)	001033	001034
Info	Passive blade operation mode (1 byte)	Value : Coordinate (8 bytes, Resolution: 0.001 [mm]/[deg])
Type	BIT	DEC(32Bit)
Comment	<ul style="list-style-type: none"> <li>• Bit0 : Maintain passive blade posture.</li> <li>• Bit1 : Passive blade fixed to wafer center.</li> </ul> <p>Note) Valid if the &lt;Axis&gt; specification is "A: Extension axis". If the &lt;Axis&gt; specification is not "A: Extension axis", specify 'C'.</p>	<p>Note) Specified in the range between "-9999999" and "9999999". If value is less than 8 digits, fill the higher digit(s) with '0' so that the field always has 8 digits. A sign is added to the highest digit. Note) If the operation range is exceeded a stroke limit error will be notified.</p>

Address(PLC)	MREL_CMD
Info	Execute command after write operation

### Message for the End-of-Execution

Address(SYS)	1300 ~ 1308																								
Info	Update values after command execution																								
Type	DEC(32Bit)																								
Value	<p>Coordinate data Responds with the feedback position at the end of execution. (Resolution: 0.001 [deg] or 0.001 [mm])</p> <ul style="list-style-type: none"> <li>• Specified in the range between "-9999999" and "9999999"</li> <li>• If value is less than 8 digits, fill the higher digit with '0' so that the field always has 8 digits.</li> <li>• Responds with the specified unit's axis count part.</li> </ul> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="width: 25%;">Unit</th> <th style="width: 25%;">Coordinate data</th> <th style="width: 25%;">Axis</th> <th style="width: 25%;">Unit</th> </tr> </thead> <tbody> <tr> <td rowspan="5">Manipulator</td> <td>PosData1</td> <td>Rotation axis</td> <td>0.001 [deg]</td> </tr> <tr> <td>PosData2</td> <td>Extension axis</td> <td>0.001 [mm]</td> </tr> <tr> <td>PosData3</td> <td>Wrist axis 1</td> <td>0.001 [deg]</td> </tr> <tr> <td>PosData4</td> <td>Wrist axis 2</td> <td>0.001 [deg]</td> </tr> <tr> <td>PosData5</td> <td>Elevation axis</td> <td>0.001 [mm]</td> </tr> <tr> <td>Pre-aligner</td> <td>PosData1</td> <td colspan="2">Rotation axis (*1)</td> </tr> </tbody> </table> <p>(*1) If the specified unit is a pre-aligner, be sure to respond with "00000000".</p>	Unit	Coordinate data	Axis	Unit	Manipulator	PosData1	Rotation axis	0.001 [deg]	PosData2	Extension axis	0.001 [mm]	PosData3	Wrist axis 1	0.001 [deg]	PosData4	Wrist axis 2	0.001 [deg]	PosData5	Elevation axis	0.001 [mm]	Pre-aligner	PosData1	Rotation axis (*1)	
Unit	Coordinate data	Axis	Unit																						
Manipulator	PosData1	Rotation axis	0.001 [deg]																						
	PosData2	Extension axis	0.001 [mm]																						
	PosData3	Wrist axis 1	0.001 [deg]																						
	PosData4	Wrist axis 2	0.001 [deg]																						
	PosData5	Elevation axis	0.001 [mm]																						
Pre-aligner	PosData1	Rotation axis (*1)																							

## MMAP (Wafer Mapping)

지정된 전송 스테이션에서 웨이퍼 매핑을 수행합니다

### [Conditions]

- The specified unit is under ready state.( 지정된 장치가 준비 상태에 있습니다)
- The specified unit is under servo ON state.( 지정된 유닛이 서보 ON 상태입니다)
- T.P.'s mode selector switch is set to Host mode (if T.P. is connected).( T.P.의 모드 선택기 스위치가 호스트 모드로 설정됩니다 (T.P.가 연결된 경우))
- The specified transfer station has been registered.( 지정된 전송 스테이션이 등록되었습니다)
- The specified transfer station's calibration operation for mapping has been performed.( 매핑을위한 지정된 전송 스테이션의 교정 작업이 수행되었습니다)

Address(SYS)	001036	001038
Info	Transfer station (3 bytes)	Slot number (2 bytes)
Type	ASCII(3)	DEC(16Bit)
Value	<ul style="list-style-type: none"> <li>• "C01" - "C08" : Cassette stage.</li> <li>• "S01" - "S12" : Transfer stage.</li> <li>• "P01" : P/A stage.</li> </ul>	<p>&lt;Cassette stage&gt;</p> <ul style="list-style-type: none"> <li>• "01" - "30" : When cassette stage specified.</li> </ul> <p>&lt;Transfer stage, Pre-aligner stage&gt;</p> <ul style="list-style-type: none"> <li>• "00" : Fixed slot(because this type of station does not have multiple slots).</li> </ul> <p>Note) If value is less than 2 digits, fill the higher digit with '0' so that the field always has 2 digits.</p> <p>Note) If &lt;Hand&gt; is 'F'(Blade 1 + Blade 2), specifies the slot accessed by Blade 1.</p>

Address(SYS)	001039
Info	Specifies wafer protrusion detection operation yes/no (1 byte)
Type	BIT
Value	<ul style="list-style-type: none"> <li>• Bit0 : No wafer protrusion detection operation.</li> <li>• Bit1 : Wafer protrusion detection operation performed.</li> </ul>

Address(PLC)	MMAP_CMD
Info	Execute command after write operation



### Message for the End-of-Execution

Address(SYS)	1300 ~ 1308																								
Info	Update values after command execution																								
Type	DEC(32Bit)																								
Value	<p>Coordinate data</p> <p>Responds with the feedback position at the end of execution. (Resolution: 0.001 [deg] or 0.001 [mm])</p> <ul style="list-style-type: none"> <li>• Specified in the range between "-9999999" and "99999999"</li> <li>• If value is less than 8 digits, fill the higher digit with '0' so that the field always has 8 digits.</li> <li>• Responds with the specified unit's axis count part.</li> </ul> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="width: 25%;">Unit</th> <th style="width: 25%;">Coordinate data</th> <th style="width: 25%;">Axis</th> <th style="width: 25%;">Unit</th> </tr> </thead> <tbody> <tr> <td rowspan="5">Manipulator</td> <td>PosData1</td> <td>Rotation axis</td> <td>0.001 [deg]</td> </tr> <tr> <td>PosData2</td> <td>Extension axis</td> <td>0.001 [mm]</td> </tr> <tr> <td>PosData3</td> <td>Wrist axis 1</td> <td>0.001 [deg]</td> </tr> <tr> <td>PosData4</td> <td>Wrist axis 2</td> <td>0.001 [deg]</td> </tr> <tr> <td>PosData5</td> <td>Elevation axis</td> <td>0.001 [mm]</td> </tr> <tr> <td>Pre-aligner</td> <td>PosData1</td> <td colspan="2">Rotation axis (*1)</td> </tr> </tbody> </table> <p>(*1) If the specified unit is a pre-aligner, be sure to respond with "00000000".</p>	Unit	Coordinate data	Axis	Unit	Manipulator	PosData1	Rotation axis	0.001 [deg]	PosData2	Extension axis	0.001 [mm]	PosData3	Wrist axis 1	0.001 [deg]	PosData4	Wrist axis 2	0.001 [deg]	PosData5	Elevation axis	0.001 [mm]	Pre-aligner	PosData1	Rotation axis (*1)	
Unit	Coordinate data	Axis	Unit																						
Manipulator	PosData1	Rotation axis	0.001 [deg]																						
	PosData2	Extension axis	0.001 [mm]																						
	PosData3	Wrist axis 1	0.001 [deg]																						
	PosData4	Wrist axis 2	0.001 [deg]																						
	PosData5	Elevation axis	0.001 [mm]																						
Pre-aligner	PosData1	Rotation axis (*1)																							

Address(SYS)	1320 ~ 1329
Info	Update values after command execution
Type	ASCII(2)
Value	<p>Mapping result (2 bytes each)</p> <ul style="list-style-type: none"> <li>• "--" : No wafer detected.</li> <li>• "OK" : Wafer inserted correctly.</li> <li>• "CW" : Wafer inserted incorrectly (inclined).</li> <li>• "DW" : Wafer inserted incorrectly (duplicated).</li> </ul> <p>Note) Responds with the number of slots of the specified transfer station.</p>

## MMCA (Mapping Calibration)

지정된 카세트 스테이션에 대한 매핑 작업을 수행합니다

### [Conditions]

- The specified unit is under ready state.( 지정된 장치가 준비 상태에 있습니다)
- The specified unit is under servo ON state.( 지정된 유닛이 서보 ON 상태입니다)
- T.P.'s mode selector switch is set to Host mode (if T.P. is connected).( T.P.의 모드 선택기 스위치가 호스트 모드로 설정됩니다 (T.P.가 연결된 경우))
- The specified transfer station has been registered.( 지정된 전송 스테이션이 등록되었습니다)
- The wafer needs to be inserted only in the lowest slot and the highest slots of cassette stage.( 웨이퍼는 카세트 스테이지의 가장 낮은 슬롯과 가장 높은 슬롯에만 삽입해야 합니다)

Address(SYS)	001040	001042
Info	Transfer station (3 bytes)	Specifies wafer protrusion detection operation yes/no (1 byte)
Type	ASCII(3)	Bit
Value	<ul style="list-style-type: none"> <li>• "C01" - "C08" : Cassette stage.</li> </ul>	<ul style="list-style-type: none"> <li>• Bit0 : No wafer protrusion detection operation.</li> <li>• Bit1 : Wafer protrusion detection operation performed.</li> </ul>

Address(PLC)	MMCA_CMD
Info	Execute command after write operation

### Message for the End-of-Execution

Address(SYS)	1300 ~ 1308																								
Info	Update values after command execution																								
Type	DEC(32Bit)																								
Value	<p>Coordinate data</p> <p>Responds with the feedback position at the end of execution. (Resolution: 0.001 [deg] or 0.001 [mm])</p> <ul style="list-style-type: none"> <li>• Specified in the range between "-9999999" and "99999999"</li> <li>• If value is less than 8 digits, fill the higher digit with '0' so that the field always has 8 digits.</li> <li>• Responds with the specified unit's axis count part.</li> </ul> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>Unit</th> <th>Coordinate data</th> <th>Axis</th> <th>Unit</th> </tr> </thead> <tbody> <tr> <td rowspan="5">Manipulator</td> <td>PosData1</td> <td>Rotation axis</td> <td>0.001 [deg]</td> </tr> <tr> <td>PosData2</td> <td>Extension axis</td> <td>0.001 [mm]</td> </tr> <tr> <td>PosData3</td> <td>Wrist axis 1</td> <td>0.001 [deg]</td> </tr> <tr> <td>PosData4</td> <td>Wrist axis 2</td> <td>0.001 [deg]</td> </tr> <tr> <td>PosData5</td> <td>Elevation axis</td> <td>0.001 [mm]</td> </tr> <tr> <td>Pre-aligner</td> <td>PosData1</td> <td colspan="2">Rotation axis (*1)</td> </tr> </tbody> </table> <p>(*1) If the specified unit is a pre-aligner, be sure to respond with "00000000".</p>	Unit	Coordinate data	Axis	Unit	Manipulator	PosData1	Rotation axis	0.001 [deg]	PosData2	Extension axis	0.001 [mm]	PosData3	Wrist axis 1	0.001 [deg]	PosData4	Wrist axis 2	0.001 [deg]	PosData5	Elevation axis	0.001 [mm]	Pre-aligner	PosData1	Rotation axis (*1)	
Unit	Coordinate data	Axis	Unit																						
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	PosData3	Wrist axis 1	0.001 [deg]																						
	PosData4	Wrist axis 2	0.001 [deg]																						
	PosData5	Elevation axis	0.001 [mm]																						
Pre-aligner	PosData1	Rotation axis (*1)																							

Address(SYS)	1330 ~ 1340
Info	Update values after command execution
Type	DEC(32Bit)
Value	<ul style="list-style-type: none"> <li>• Value1 : Lowest-slot position (8 bytes, Resolution: 0.001 [mm])</li> <li>• Value2 : highest-slot position (8 bytes, Resolution: 0.001 [mm])</li> <li>• Value3 : Wafer width (8 bytes, Resolution: 0.001 [mm])</li> <li>• Value4 : The threshold value of double insertion (8 bytes, Resolution: 0.001 [mm])</li> <li>• Value5 : The threshold value of slanting insertion1 (8 bytes, Resolution: 0.001 [mm])</li> <li>• Value6 : The threshold value of slanting insertion2 (8 bytes, Resolution: 0.001 [mm])</li> </ul>

## MALN (Wafer alignment)

pre-aligner에서 웨이퍼를 정렬합니다

### [Conditions]

- The specified unit is under ready state.( 지정된 장치가 준비 상태에 있습니다)
- The specified unit is under servo ON state.( 지정된 유닛이 서보 ON 상태입니다)
- T.P.'s mode selector switch is set to Host mode (if T.P. is connected).( T.P.의 모드 선택기 스위치가 호스트 모드로 설정됩니다 (T.P.가 연결된 경우))
- In the case of edge grip pre-aligner, the action command immediately before this command has to be a successfully completed "MTRS" command.( 가장자리 그립 프리 얼 라이너의 경우이 명령 직전의 동작 명령이 있어야합니다 성공적으로 완료된 "MTRS"명령)

Address(SYS)	001043	001044
Info	Motion mode (1 byte)	Positioning angle (None / 8 bytes each, Resolution: 0.001 [deg])
Type	BIT	DEC(32Bit)
Value	<ul style="list-style-type: none"> <li>• Bit0 : Sampling operation + Correction operation.</li> <li>• Bit1 : Correction operation.</li> <li>• Bit2 : Sampling operation.</li> </ul>	<p>Note) Relative angle from the position set by alignment calibration as the reference point.</p> <p>Note) Specified in the range between "00000000" and "00359999". If a value is less than the specified digits, fill the higher digit(s) with '0' so that the field always has specified digits.</p>

Address(PLC)	MALN_CMD
Info	Execute command after write operation

### Message for the End-of-Execution

Address(SYS)	1300 ~ 1308																								
Info	Update values after command execution																								
Type	DEC(32Bit)																								
Value	<p>Coordinate data</p> <p>Responds with the feedback position at the end of execution. (Resolution: 0.001 [deg] or 0.001 [mm])</p> <ul style="list-style-type: none"> <li>• Specified in the range between "-99999999" and "99999999"</li> <li>• If value is less than 8 digits, fill the higher digit with '0' so that the field always has 8 digits.</li> <li>• Responds with the specified unit's axis count part.</li> </ul> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>Unit</th> <th>Coordinate data</th> <th>Axis</th> <th>Unit</th> </tr> </thead> <tbody> <tr> <td rowspan="5">Manipulator</td> <td>PosData1</td> <td>Rotation axis</td> <td>0.001 [deg]</td> </tr> <tr> <td>PosData2</td> <td>Extension axis</td> <td>0.001 [mm]</td> </tr> <tr> <td>PosData3</td> <td>Wrist axis 1</td> <td>0.001 [deg]</td> </tr> <tr> <td>PosData4</td> <td>Wrist axis 2</td> <td>0.001 [deg]</td> </tr> <tr> <td>PosData5</td> <td>Elevation axis</td> <td>0.001 [mm]</td> </tr> <tr> <td>Pre-aligner</td> <td>PosData1</td> <td colspan="2">Rotation axis (*1)</td> </tr> </tbody> </table> <p>(*1) If the specified unit is a pre-aligner, be sure to respond with "00000000".</p>	Unit	Coordinate data	Axis	Unit	Manipulator	PosData1	Rotation axis	0.001 [deg]	PosData2	Extension axis	0.001 [mm]	PosData3	Wrist axis 1	0.001 [deg]	PosData4	Wrist axis 2	0.001 [deg]	PosData5	Elevation axis	0.001 [mm]	Pre-aligner	PosData1	Rotation axis (*1)	
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Manipulator	PosData1	Rotation axis	0.001 [deg]																						
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	PosData4	Wrist axis 2	0.001 [deg]																						
	PosData5	Elevation axis	0.001 [mm]																						
Pre-aligner	PosData1	Rotation axis (*1)																							

Address(SYS)	1350 ~ 1368
Info	Update values after command execution
Type	DEC(32Bit)
Value	<ul style="list-style-type: none"> <li>• Value1 : Wafer eccentric amount before alignment operation (8 bytes, Resolution: 0.001 [mm])</li> <li>• Value2 : Wafer eccentric angle direction before alignment operation (8 bytes, Resolution: 0.001 [deg])</li> <li>• Value3 : Notch/Orientation Flat direction before alignment operation (8 bytes, Resolution: 0.001 [deg])</li> <li>• Value4 : X direction offset amount before alignment operation (8 bytes, Resolution: 0.001 [mm])</li> <li>• Value5 : Y direction offset amount before alignment operation (8 bytes, Resolution: 0.001 [mm])</li> <li>• Value6 : Pre-aligner adjustment angle (8 bytes, Resolution: 0.001 [deg])</li> <li>• Value7 : Manipulator adjustment amount (8 bytes, Resolution: 0.001 [mm])</li> <li>• Value8 : Manipulator adjustment angle (8 bytes, Resolution: 0.001 [deg])</li> <li>• Value9 : X direction offset amount after alignment operation (8 bytes, Resolution: 0.001 [mm])</li> <li>• Value10 : Y direction offset amount after alignment operation (8 bytes, Resolution: 0.001 [mm])</li> </ul>



	<ul style="list-style-type: none"> <li>If a value is less than the specified digits, fill the higher digit(s) with '0' so that the field always has specified digits.</li> </ul>
--	--

## MACA (Alignment Calibration)

웨이퍼 정렬을 위한 보정을 수행합니다

### [Conditions]

- The specified unit is under ready state. (지정된 장치가 준비 상태에 있습니다)
- The specified unit is under servo ON state. (지정된 유닛이 서보 ON 상태입니다)
- T.P.'s mode selector switch is set to Host mode (if T.P. is connected). (T.P.의 모드 선택기 스위치가 호스트 모드로 설정됩니다 (T.P.가 연결된 경우))

Address(SYS)	001046
Info	Motion mode (1 byte)
Type	BIT
Value	<ul style="list-style-type: none"> <li>Bit0 : Notch calibration.</li> <li>Bit1 : Arm calibration.</li> </ul>

Address(PLC)	MACA_CMD
Info	Execute command after write operation

### Message for the End-of-Execution

Address(SYS)	1300 ~ 1308																								
Info	Update values after command execution																								
Type	DEC(32Bit)																								
Value	<p>Coordinate data Responds with the feedback position at the end of execution. (Resolution: 0.001 [deg] or 0.001 [mm])</p> <ul style="list-style-type: none"> <li>Specified in the range between "-9999999" and "99999999"</li> <li>If value is less than 8 digits, fill the higher digit with '0' so that the field always has 8 digits.</li> <li>Responds with the specified unit's axis count part.</li> </ul> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="width: 25%;">Unit</th> <th style="width: 25%;">Coordinate data</th> <th style="width: 25%;">Axis</th> <th style="width: 25%;">Unit</th> </tr> </thead> <tbody> <tr> <td rowspan="5">Manipulator</td> <td>PosData1</td> <td>Rotation axis</td> <td>0.001 [deg]</td> </tr> <tr> <td>PosData2</td> <td>Extension axis</td> <td>0.001 [mm]</td> </tr> <tr> <td>PosData3</td> <td>Wrist axis 1</td> <td>0.001 [deg]</td> </tr> <tr> <td>PosData4</td> <td>Wrist axis 2</td> <td>0.001 [deg]</td> </tr> <tr> <td>PosData5</td> <td>Elevation axis</td> <td>0.001 [mm]</td> </tr> <tr> <td>Pre-aligner</td> <td>PosData1</td> <td colspan="2">Rotation axis (*1)</td> </tr> </tbody> </table> <p>(*1) If the specified unit is a pre-aligner, be sure to respond with "00000000".</p>	Unit	Coordinate data	Axis	Unit	Manipulator	PosData1	Rotation axis	0.001 [deg]	PosData2	Extension axis	0.001 [mm]	PosData3	Wrist axis 1	0.001 [deg]	PosData4	Wrist axis 2	0.001 [deg]	PosData5	Elevation axis	0.001 [mm]	Pre-aligner	PosData1	Rotation axis (*1)	
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Manipulator	PosData1	Rotation axis	0.001 [deg]																						
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	PosData4	Wrist axis 2	0.001 [deg]																						
	PosData5	Elevation axis	0.001 [mm]																						
Pre-aligner	PosData1	Rotation axis (*1)																							

Address(SYS)	1370 ~ 1374
Info	Update values after command execution
Type	DEC(32Bit)
Value	<ul style="list-style-type: none"> <li>Value1 : calibration angle (8 bytes, Resolution: 0.001 [deg])</li> <li>Value2 : Manipulator advance angle (8 bytes, Resolution: 0.001 [deg])</li> <li>Value3 : Distance between manipulator rotation center and pre-aligner rotation center distance (8 bytes, Resolution: 0.001 [mm])</li> </ul>

## CSTP (Deceleration/Emergency stop)

감속 / 비상 정지를 적용하여 지정된 장치의 동작을 중지합니다

### [Conditions]

- T.P.'s mode selector switch is set to Host mode (if T.P. is connected).( T.P.의 모드 선택기 스위치가 호스트 모드로 설정됩니다 (T.P.가 연결된 경우))

Address(SYS)	001047
Info	Stop mode (1 byte)
Type	BIT
Value	<ul style="list-style-type: none"> <li>• Bit0 : Deceleration to a stop.</li> <li>• Bit1 : Emergency stop.</li> </ul>

Address(PLC)	CSTP_CMD
Info	Execute command after write operation

### Message for the End-of-Execution

Address(SYS)	1300 ~ 1308																								
Info	Update values after command execution																								
Type	DEC(32Bit)																								
Value	<p>Coordinate data Responds with the feedback position at the end of execution. (Resolution: 0.001 [deg] or 0.001 [mm])</p> <ul style="list-style-type: none"> <li>• Specified in the range between "-9999999" and "99999999"</li> <li>• If value is less than 8 digits, fill the higher digit with '0' so that the field always has 8 digits.</li> <li>• Responds with the specified unit's axis count part.</li> </ul> <table border="1" data-bbox="300 981 1331 1249"> <thead> <tr> <th>Unit</th> <th>Coordinate data</th> <th>Axis</th> <th>Unit</th> </tr> </thead> <tbody> <tr> <td rowspan="5">Manipulator</td> <td>PosData1</td> <td>Rotation axis</td> <td>0.001 [deg]</td> </tr> <tr> <td>PosData2</td> <td>Extension axis</td> <td>0.001 [mm]</td> </tr> <tr> <td>PosData3</td> <td>Wrist axis 1</td> <td>0.001 [deg]</td> </tr> <tr> <td>PosData4</td> <td>Wrist axis 2</td> <td>0.001 [deg]</td> </tr> <tr> <td>PosData5</td> <td>Elevation axis</td> <td>0.001 [mm]</td> </tr> <tr> <td>Pre-aligner</td> <td>PosData1</td> <td colspan="2">Rotation axis (*1)</td> </tr> </tbody> </table> <p>(*1) If the specified unit is a pre-aligner, be sure to respond with "00000000".</p>	Unit	Coordinate data	Axis	Unit	Manipulator	PosData1	Rotation axis	0.001 [deg]	PosData2	Extension axis	0.001 [mm]	PosData3	Wrist axis 1	0.001 [deg]	PosData4	Wrist axis 2	0.001 [deg]	PosData5	Elevation axis	0.001 [mm]	Pre-aligner	PosData1	Rotation axis (*1)	
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	PosData5	Elevation axis	0.001 [mm]																						
Pre-aligner	PosData1	Rotation axis (*1)																							

## CRSM (Resume the interrupted motion)

감속 정지로 중단 된 모션을 다시 시작합니다

### [Conditions]

- The specified unit is under ready state.( 지정된 장치가 준비 상태에 있습니다)
- The specified unit is under servo ON state.( 지정된 유닛이 서보 ON 상태입니다)
- T.P.'s mode selector switch is set to Host mode (if T.P. is connected).( T.P.의 모드 선택기 스위치가 호스트 모드로 설정됩니다 (T.P.가 연결된 경우))
- The last command is "CSTP" command(deceleration stop).( 마지막 명령은 "CSTP"명령 (감속 정지)입니다)

Address(PLC)	CRSM_CMD
Info	Execute command after write operation

### Message for the End-of-Execution

Address(SYS)	1300 ~ 1308																								
Info	Update values after command execution																								
Type	DEC(32Bit)																								
Value	<p>Coordinate data Responds with the feedback position at the end of execution. (Resolution: 0.001 [deg] or 0.001 [mm])</p> <ul style="list-style-type: none"> <li>• Specified in the range between "-9999999" and "99999999"</li> <li>• If value is less than 8 digits, fill the higher digit with '0' so that the field always has 8 digits.</li> <li>• Responds with the specified unit's axis count part.</li> </ul> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>Unit</th> <th>Coordinate data</th> <th>Axis</th> <th>Unit</th> </tr> </thead> <tbody> <tr> <td rowspan="5">Manipulator</td> <td>PosData1</td> <td>Rotation axis</td> <td>0.001 [deg]</td> </tr> <tr> <td>PosData2</td> <td>Extension axis</td> <td>0.001 [mm]</td> </tr> <tr> <td>PosData3</td> <td>Wrist axis 1</td> <td>0.001 [deg]</td> </tr> <tr> <td>PosData4</td> <td>Wrist axis 2</td> <td>0.001 [deg]</td> </tr> <tr> <td>PosData5</td> <td>Elevation axis</td> <td>0.001 [mm]</td> </tr> <tr> <td>Pre-aligner</td> <td>PosData1</td> <td colspan="2">Rotation axis (*1)</td> </tr> </tbody> </table> <p>(*1) If the specified unit is a pre-aligner, be sure to respond with "00000000".</p>	Unit	Coordinate data	Axis	Unit	Manipulator	PosData1	Rotation axis	0.001 [deg]	PosData2	Extension axis	0.001 [mm]	PosData3	Wrist axis 1	0.001 [deg]	PosData4	Wrist axis 2	0.001 [deg]	PosData5	Elevation axis	0.001 [mm]	Pre-aligner	PosData1	Rotation axis (*1)	
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	PosData5	Elevation axis	0.001 [mm]																						
Pre-aligner	PosData1	Rotation axis (*1)																							

## CSRV (Servo power command)

지정한 유닛의 서보 전원을 ON / OFF합니다.

### [Conditions]

- The specified unit is under ready state.( 지정된 장치가 준비 상태에 있습니다.)
- The specified unit is under servo ON state.
- T.P.'s mode selector switch is set to Host mode (if T.P. is connected).( T.P.의 모드 선택기 스위치가 호스트 모드로 설정됩니다 (T.P.가 연결된 경우))
- The last command is "CSTP" command(deceleration stop).

Address(SYS)	001048
Info	Servo command (1 byte)
Type	BIT
Value	<ul style="list-style-type: none"> <li>• Bit0 : Servo OFF.</li> <li>• Bit1 : Servo ON.</li> </ul>

Address(PLC)	CSRV_CMD
Info	Execute command after write operation

### Message for the End-of-Execution

Address(SYS)	1300 ~ 1308																								
Info	Update values after command execution																								
Type	DEC(32Bit)																								
Value	<p>Coordinate data Responds with the feedback position at the end of execution. (Resolution: 0.001 [deg] or 0.001 [mm])</p> <ul style="list-style-type: none"> <li>• Specified in the range between "-9999999" and "99999999"</li> <li>• If value is less than 8 digits, fill the higher digit with '0' so that the field always has 8 digits.</li> <li>• Responds with the specified unit's axis count part.</li> </ul> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 25%;">Unit</th> <th style="width: 25%;">Coordinate data</th> <th style="width: 25%;">Axis</th> <th style="width: 25%;">Unit</th> </tr> </thead> <tbody> <tr> <td rowspan="5" style="text-align: center;">Manipulator</td> <td style="text-align: center;">PosData1</td> <td style="text-align: center;">Rotation axis</td> <td style="text-align: center;">0.001 [deg]</td> </tr> <tr> <td style="text-align: center;">PosData2</td> <td style="text-align: center;">Extension axis</td> <td style="text-align: center;">0.001 [mm]</td> </tr> <tr> <td style="text-align: center;">PosData3</td> <td style="text-align: center;">Wrist axis 1</td> <td style="text-align: center;">0.001 [deg]</td> </tr> <tr> <td style="text-align: center;">PosData4</td> <td style="text-align: center;">Wrist axis 2</td> <td style="text-align: center;">0.001 [deg]</td> </tr> <tr> <td style="text-align: center;">PosData5</td> <td style="text-align: center;">Elevation axis</td> <td style="text-align: center;">0.001 [mm]</td> </tr> <tr> <td style="text-align: center;">Pre-aligner</td> <td style="text-align: center;">PosData1</td> <td colspan="2" style="text-align: center;">Rotation axis (*1)</td> </tr> </tbody> </table> <p>(*1) If the specified unit is a pre-aligner, be sure to respond with "00000000".</p>	Unit	Coordinate data	Axis	Unit	Manipulator	PosData1	Rotation axis	0.001 [deg]	PosData2	Extension axis	0.001 [mm]	PosData3	Wrist axis 1	0.001 [deg]	PosData4	Wrist axis 2	0.001 [deg]	PosData5	Elevation axis	0.001 [mm]	Pre-aligner	PosData1	Rotation axis (*1)	
Unit	Coordinate data	Axis	Unit																						
Manipulator	PosData1	Rotation axis	0.001 [deg]																						
	PosData2	Extension axis	0.001 [mm]																						
	PosData3	Wrist axis 1	0.001 [deg]																						
	PosData4	Wrist axis 2	0.001 [deg]																						
	PosData5	Elevation axis	0.001 [mm]																						
Pre-aligner	PosData1	Rotation axis (*1)																							

## CCLR (Clear the error)

지정한 단위의 현재 오류 또는 오류 내역을 지웁니다

### [Conditions]

< For an error clear >

- The specified unit is under ready state.( 지정된 장치가 준비 상태에 있습니다)
- T.P.'s mode selector switch is set to Host mode (if T.P. is connected).( T.P.의 모드 선택기 스위치가 호스트 모드로 설정됩니다 (T.P.가 연결된 경우))

< Clearing the error history >

- The specified unit is under ready state. .( 지정된 장치가 준비 상태에 있습니다)
- T.P.'s mode selector switch is set to Host mode (if T.P. is connected). (if T.P. is connected).( T.P.의 모드 선택기 스위치가 호스트 모드로 설정됩니다 (T.P.가 연결된 경우))
- No error is occurring. (오류가 발생하지 않습니다)

Address(SYS)	001049
Info	Clear mode (1 byte)
Type	BIT
Value	<ul style="list-style-type: none"> <li>• Bit0 : Clears the error status.</li> <li>• Bit1 : Clears the error history (in the volatile memory)..</li> </ul>

Address(PLC)	CCLR_CMD
Info	Execute command after write operation

### Message for the End-of-Execution

Address(SYS)	1300 ~ 1308																								
Info	Update values after command execution																								
Type	DEC(32Bit)																								
Value	<p>Coordinate data Responds with the feedback position at the end of execution. (Resolution: 0.001 [deg] or 0.001 [mm])</p> <ul style="list-style-type: none"> <li>• Specified in the range between "-9999999" and "99999999"</li> <li>• If value is less than 8 digits, fill the higher digit with '0' so that the field always has 8 digits.</li> <li>• Responds with the specified unit's axis count part.</li> </ul> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 25%;">Unit</th> <th style="width: 25%;">Coordinate data</th> <th style="width: 25%;">Axis</th> <th style="width: 25%;">Unit</th> </tr> </thead> <tbody> <tr> <td rowspan="5" style="text-align: center;">Manipulator</td> <td style="text-align: center;">PosData1</td> <td style="text-align: center;">Rotation axis</td> <td style="text-align: center;">0.001 [deg]</td> </tr> <tr> <td style="text-align: center;">PosData2</td> <td style="text-align: center;">Extension axis</td> <td style="text-align: center;">0.001 [mm]</td> </tr> <tr> <td style="text-align: center;">PosData3</td> <td style="text-align: center;">Wrist axis 1</td> <td style="text-align: center;">0.001 [deg]</td> </tr> <tr> <td style="text-align: center;">PosData4</td> <td style="text-align: center;">Wrist axis 2</td> <td style="text-align: center;">0.001 [deg]</td> </tr> <tr> <td style="text-align: center;">PosData5</td> <td style="text-align: center;">Elevation axis</td> <td style="text-align: center;">0.001 [mm]</td> </tr> <tr> <td style="text-align: center;">Pre-aligner</td> <td style="text-align: center;">PosData1</td> <td colspan="2" style="text-align: center;">Rotation axis (*1)</td> </tr> </tbody> </table> <p>(*1) If the specified unit is a pre-aligner, be sure to respond with "00000000".</p>	Unit	Coordinate data	Axis	Unit	Manipulator	PosData1	Rotation axis	0.001 [deg]	PosData2	Extension axis	0.001 [mm]	PosData3	Wrist axis 1	0.001 [deg]	PosData4	Wrist axis 2	0.001 [deg]	PosData5	Elevation axis	0.001 [mm]	Pre-aligner	PosData1	Rotation axis (*1)	
Unit	Coordinate data	Axis	Unit																						
Manipulator	PosData1	Rotation axis	0.001 [deg]																						
	PosData2	Extension axis	0.001 [mm]																						
	PosData3	Wrist axis 1	0.001 [deg]																						
	PosData4	Wrist axis 2	0.001 [deg]																						
	PosData5	Elevation axis	0.001 [mm]																						
Pre-aligner	PosData1	Rotation axis (*1)																							

## CSOL (Solenoid control command)

지정한 단위의 솔레노이드에 대한 웨이퍼 홀드 / 해제 신호를 명령합니다

### [Conditions]

- The specified unit is under ready state.( 지정된 장치가 준비 상태에 있습니다)
- T.P.'s mode selector switch is set to Host mode (if T.P. is connected).( T.P.의 모드 선택기 스위치가 호스트 모드로 설정됩니다 (T.P.가 연결된 경우).)

Address(SYS)	001050	001051	001052
Info	Solenoid control specification (1 byte)	Solenoid command (1 byte)	Wait time (1 byte)
Type	BIT	BIT	BIT
Value	<p>&lt; Manipulator &gt;</p> <ul style="list-style-type: none"> <li>• Bit0 : Blade 1.</li> <li>• Bit1 : Blade 2.</li> <li>• Bit2 : Blade 1 + Blade 2.</li> </ul> <p>&lt; Pre-aligner &gt;</p> <ul style="list-style-type: none"> <li>• Bit1 : Pre-aligner.</li> <li>• Bit2 : Edge-grip pre-aligner Lifter.</li> </ul>	<ul style="list-style-type: none"> <li>• Bit0 : Wafer release.</li> <li>• Bit1 : Wafer hold.</li> </ul>	<ul style="list-style-type: none"> <li>• Bit0 : No wait time.</li> <li>• Bit1 : With wait time.</li> </ul>

Address(PLC)	CSOL_CMD
Info	Execute command after write operation

### Message for the End-of-Execution

Address(SYS)	1300 ~ 1308																								
Info	Update values after command execution																								
Type	DEC(32Bit)																								
Value	<p>Coordinate data</p> <p>Responds with the feedback position at the end of execution. (Resolution: 0.001 [deg] or 0.001 [mm])</p> <ul style="list-style-type: none"> <li>• Specified in the range between "-9999999" and "99999999"</li> <li>• If value is less than 8 digits, fill the higher digit with '0' so that the field always has 8 digits.</li> <li>• Responds with the specified unit's axis count part.</li> </ul> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 25%;">Unit</th> <th style="width: 25%;">Coordinate data</th> <th style="width: 25%;">Axis</th> <th style="width: 25%;">Unit</th> </tr> </thead> <tbody> <tr> <td rowspan="5" style="text-align: center;">Manipulator</td> <td style="text-align: center;">PosData1</td> <td style="text-align: center;">Rotation axis</td> <td style="text-align: center;">0.001 [deg]</td> </tr> <tr> <td style="text-align: center;">PosData2</td> <td style="text-align: center;">Extension axis</td> <td style="text-align: center;">0.001 [mm]</td> </tr> <tr> <td style="text-align: center;">PosData3</td> <td style="text-align: center;">Wrist axis 1</td> <td style="text-align: center;">0.001 [deg]</td> </tr> <tr> <td style="text-align: center;">PosData4</td> <td style="text-align: center;">Wrist axis 2</td> <td style="text-align: center;">0.001 [deg]</td> </tr> <tr> <td style="text-align: center;">PosData5</td> <td style="text-align: center;">Elevation axis</td> <td style="text-align: center;">0.001 [mm]</td> </tr> <tr> <td style="text-align: center;">Pre-aligner</td> <td style="text-align: center;">PosData1</td> <td colspan="2" style="text-align: center;">Rotation axis (*1)</td> </tr> </tbody> </table> <p>(*1) If the specified unit is a pre-aligner, be sure to respond with "00000000".</p>	Unit	Coordinate data	Axis	Unit	Manipulator	PosData1	Rotation axis	0.001 [deg]	PosData2	Extension axis	0.001 [mm]	PosData3	Wrist axis 1	0.001 [deg]	PosData4	Wrist axis 2	0.001 [deg]	PosData5	Elevation axis	0.001 [mm]	Pre-aligner	PosData1	Rotation axis (*1)	
Unit	Coordinate data	Axis	Unit																						
Manipulator	PosData1	Rotation axis	0.001 [deg]																						
	PosData2	Extension axis	0.001 [mm]																						
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	PosData4	Wrist axis 2	0.001 [deg]																						
	PosData5	Elevation axis	0.001 [mm]																						
Pre-aligner	PosData1	Rotation axis (*1)																							

## SSPD (Set Motion Speed)

동작 속도 (노 - 웨이퍼 이송 속도, 웨이퍼 - 이송 속도, 저속 이송 속도, 원점 복귀 속도, 저속 영역 속도)를 설정합니다

### [Conditions]

- The specified unit is under ready state.( 지정된 장치가 준비 상태에 있습니다)
- T.P.'s mode selector switch is set to Host mode (if T.P. is connected).( T.P.의 모드 선택기 스위치가 호스트 모드로 설정됩니다 (T.P.가 연결된 경우).)

Address(SYS)	001053	001054
Info	Transfer speed level (1 byte)	Speed type (1 byte)
Type	BIT	BIT
Value	<ul style="list-style-type: none"> <li>• Bit0 : Currently set speed level.</li> <li>• Bit1 : Speed level 1.</li> <li>• Bit2 : Speed level 2.</li> <li>• Bit3 : Speed level 3.</li> </ul>	<ul style="list-style-type: none"> <li>• Bit0 : No-wafer transfer speed.</li> <li>• Bit1 : With-wafer transfer speed.</li> <li>• Bit2 : Low speed.</li> <li>• Bit3 (Alphabet. Not zero.) : Home speed.</li> <li>• Bit4 : Speed in low-speed-area.</li> </ul>

Address(SYS)	001055	001056
Info	Axis (1 byte)	Speed data (8 bytes)
Type	BIT	DEC(32Bit)
Value	<p>&lt; Manipulator &gt;</p> <ul style="list-style-type: none"> <li>• Bit0 : Rotation axis.</li> <li>• Bit1 : Extension axis.</li> <li>• Bit2 : Wrist axis1.</li> <li>• Bit3 : Wrist axis2.</li> <li>• Bit4 : Elevation axis.</li> <li>• Bit5 : Linear access motion speed.</li> <li>• Bit6 : All axes (Setting method is % specification only).</li> </ul> <p>&lt; Pre-aligner &gt;</p> <ul style="list-style-type: none"> <li>• Bit0 : Rotation axis.</li> <li>• Bit6 : All axes (Setting method is % specification only).</li> </ul>	<p>Note) Specified in the range between "00000001" and "99999999". (Resolution: 0.001 [mm/sec], [deg/sec])</p> <p>Note) Adding '%' before the first digit sets to the ratio of the specified speed's maximum speed. When specifying a percentage, specify in the range between "%0000001" and "%0001000". (Resolution: 0.1 [%])</p> <p>Note) If value is less than 8 digits, fill the higher digit(s) with '0' so that the field always has 8 digits.</p>

Address(PLC)	SSPD_CMD
Info	Execute command after write operation

## SSLV (Transfer speed level setting)

속도 레벨 (웨이퍼 없음, 웨이퍼 내 전송 속도, 저속 전송 속도, 원점 복귀 속도, 저속 영역 속도)를 설정합니다

### [Conditions]

- The specified unit is under ready state.( 지정된 장치가 준비 상태에 있습니다)
- T.P.'s mode selector switch is set to Host mode (if T.P. is connected).( T.P.의 모드 선택기 스위치가 호스트 모드로 설정됩니다 (T.P.가 연결된 경우).)

Address(SYS)	001058
Info	Transfer speed level (1 byte)
Type	BIT
Value	<ul style="list-style-type: none"> <li>• Bit0 : Speed level 1.</li> <li>• Bit1 : Speed level 2.</li> <li>• Bit2 : Speed level 3.</li> </ul>

Address(PLC)	SSLV_CMD
Info	Execute command after write operation

## SPOS (Registration of Current Position)

지정된 단위의 현재 위치를 지정된 전송 스테이션으로 등록합니다

### [Conditions]

- The specified unit is under ready state.( 지정된 장치가 준비 상태에 있습니다)
- The specified unit is under servo ON state.( 지정된 유닛이 서보 ON 상태 임)
- T.P.'s mode selector switch is set to Host mode (if T.P. is connected).( T.P.의 모드 선택기 스위치가 호스트 모드로 설정됩니다 (T.P.가 연결된 경우).)

Address(SYS)	001059	001060	001061
Info	Memory specification (1 byte)	Registration mode (1 byte)	Transfer station (3 bytes)
Type	BIT	BIT	ASCII(3)
Comment	<ul style="list-style-type: none"> <li>• Bit0 : Volatile memory.</li> <li>• Bit1 : Volatile memory and Non-volatile memory.</li> </ul>	<ul style="list-style-type: none"> <li>• Bit0 : Specified position registration.</li> <li>• Bit1 : Master registration.</li> </ul>	<ul style="list-style-type: none"> <li>• "C01" - "C08" : Cassette stage (the lowest-layer position).</li> <li>• "H01" - "H08" : Cassette stage (the highest-layer position).</li> <li>• "S01" - "S12" : Transfer stage.</li> <li>• "P01" : P/A stage.</li> </ul>

Address(SYS)	001063
Info	Slot number (2 bytes)
Type	DEC(16Bit)
Value	<p>&lt;Cassette stage&gt;</p> <ul style="list-style-type: none"> <li>• "01" - "30" : If &lt;TrsSt&gt; is "C01"-"C08"(cassette stage), the slot specified.</li> <li>• "00" : If &lt;TrsSt&gt; is "C01"-"C08"(cassette stage), recognize the lowest-slot.</li> </ul> <p>If &lt;TrsSt&gt; is "H01"-"H08"(cassette stage), recognize the highest-slot.</p> <p>&lt;Transfer stage, Pre-aligner stage&gt;</p> <ul style="list-style-type: none"> <li>• "00" : Fixed value t(because this type of station does not have multiple slots.)</li> </ul> <p>Note) If value is less than 2 digits, fill the higher digit with '0' so that the field always has 2 digits.</p> <p>Note) If the slot number is specified, the lowest-slot position or the highest-slot position are calculated by the slot number and the slot pitch, and save it.</p> <p>Note) If the operation range is exceeded a stroke limit error will be notified.</p>

Address(SYS)	001064	001065
Info	Arm Posture (1 byte)	Blade (1 byte)
Type	BIT	BIT
Value	<ul style="list-style-type: none"> <li>• Bit0 : Left elbow.</li> <li>• Bit1 : Right elbow.</li> </ul>	<ul style="list-style-type: none"> <li>• Bit0 : Blade 1.</li> <li>• Bit1 : Blade 2.</li> </ul>

Address(PLC)	SPOS_CMD
Info	Execute command after write operation

## SABS (Registration of Coordinate Position)

지정된 단위의 지정된 전송 스테이션으로 좌표 위치를 등록합니다

### [Conditions]

- The specified unit is under ready state.( 지정된 장치가 준비 상태에 있습니다)• T.P.'s mode selector switch is set to Host mode (if T.P. is connected).( T.P.의 모드 선택기 스위치가 호스트 모드로 설정됩니다 (T.P.가 연결된 경우).)

Address(SYS)	001066	001067
Info	Memory specification (1 byte)	Registration mode (1 byte)
Type	BIT	BIT
Value	<ul style="list-style-type: none"> <li>• Bit0 : Volatile memory.</li> <li>• Bit1 : Volatile memory and Non-volatile memory.</li> </ul>	<ul style="list-style-type: none"> <li>• Bit0 : Specified position registration.</li> <li>• Bit1 : Master registration.</li> </ul>

Address(SYS)	001068	001070	001071
Info	Transfer station (3 bytes)	Arm Posture (1 byte)	Blade (1 byte)
Type	ASCII(3)	BIT	BIT
Value	<ul style="list-style-type: none"> <li>• "C01" - "C08" : Cassette stage (the lowest-layer position).</li> <li>• "H01" - "H08" : Cassette stage (the highest-layer position).</li> <li>• "S01" - "S12" : Transfer stage.</li> <li>• "P01" : P/A stage.</li> </ul>	<ul style="list-style-type: none"> <li>• Bit0 : Left elbow.</li> <li>• Bit1 : Right elbow.</li> </ul>	<ul style="list-style-type: none"> <li>• Bit0 : Blade 1</li> <li>• Bit1 : Blade 2</li> </ul>

Address(SYS)	001072 - 001080
Info	Coordinate (8 bytes each, Resolution: 0.001 [mm]/[deg])
Type	DEC(32Bit)
Value	<p>Note) Specified in the range between "-9999999" and "99999999".</p> <p>If the operation range is exceeded, a stroke limit error is notified.</p> <p>If value is less than 8 digits, fill the higher digit(s) with '0' so that the field always has 8 digits.</p> <p>A sign is added to the highest digit.</p> <p>Note) If the operation range is exceeded a stroke limit error will be notified.</p> <p>Note) The number of "ValueN" depends on the unit type. Set as many axis numbers as the specified unit has.</p>

Address(PLC)	SABS_CMD
Info	Execute command after write operation

## SAPS (Registered Position Adjustment)

지정된 전송 스테이션의 티칭 위치를 조정합니다

### [Conditions]

- The specified unit is under ready state.( 지정된 장치가 준비 상태에 있습니다)
- T.P.'s mode selector switch is set to Host mode (if T.P. is connected).( T.P.의 모드 선택기 스위치가 호스트 모드로 설정됩니다 (T.P.가 연결된 경우).)

Address(SYS)	001082	001083
Info	Memory specification (1 byte)	Registration mode (1 byte)
Type	BIT	BIT
Value	<ul style="list-style-type: none"> <li>• Bit0 : Volatile memory.</li> <li>• Bit1 : Volatile memory and Non-volatile memory.</li> </ul>	<ul style="list-style-type: none"> <li>• Bit0 : Specified position registration.</li> <li>• Bit1 : Master registration.</li> </ul>

Address	001084	001086
Info	Transfer station (3 bytes)	Arm Posture (1 byte)
Type	ASCII(3)	BIT
Value	<ul style="list-style-type: none"> <li>• "C01" - "C08" : Cassette stage (the lowest-layer position).</li> <li>• "H01" - "H08" : Cassette stage (the highest-layer position).</li> <li>• "S01" - "S12" : Transfer stage.</li> <li>• "P01" : P/A stage.</li> </ul>	<ul style="list-style-type: none"> <li>• Bit0 : Left elbow.</li> <li>• Bit1 : Right elbow.</li> </ul>

Address(SYS)	001087	001088 ~ 001090
Info	Blade (1 byte)	XYZ direction offset (8 bytes each, Resolution: 0.001 [mm])
Type	BIT	DEC(32Bit)
Value	<ul style="list-style-type: none"> <li>• Bit0 : Blade 1</li> <li>• Bit1 : Blade 2</li> </ul>	<ul style="list-style-type: none"> <li>• OfstX : X direction offset</li> <li>• OfstY : Y direction offset</li> <li>• OfstZ : Z direction offset</li> </ul> <p>Note) Specified in the range between "-0009999" and "00009999". If a value is less than the specified digits, fill the higher digit(s) with '0' so that the field always has specified digits. A sign is added to the highest digit. Note) If the operation range is exceeded a stroke limit error will be notified.</p>

Address(PLC)	SAPS_CMD
Info	Execute command after write operation

## SPDL (Delete Registered Position)

지정된 유닛의 지정된 전송 스테이션의 등록 된 위치를 삭제합니다

### [Conditions]

- The specified unit is under ready state.( 지정된 장치가 준비 상태에 있습니다)
- T.P.'s mode selector switch is set to Host mode (if T.P. is connected).( T.P.의 모드 선택기 스위치가 호스트 모드로 설정됩니다 (T.P.가 연결된 경우).)

Address(SYS)	001091	001092
Info	Memory specification (1 byte)	Transfer station (3 bytes)
Type	BIT	ASCII(3)
Value	<ul style="list-style-type: none"> <li>• Bit0 : Only volatile memory deleted.</li> <li>• Bit1 : Delete volatile memory and non-volatile memory.</li> </ul>	<ul style="list-style-type: none"> <li>• "C01" - "C08" : Cassette stage (the lowest-layer position).</li> <li>• "H01" - "H08" : Cassette stage (the highest-layer position).</li> <li>• "S01" - "S12" : Transfer stage.</li> <li>• "P01" : P/A stage.</li> <li>• "FFF" : All transfer stations.</li> </ul>

Address(SYS)	001094	001095
Info	Arm Posture (1 byte)	Blade (1 byte)
Type	BIT	BIT
Value	<ul style="list-style-type: none"> <li>• Bit0 : Left elbow.</li> <li>• Bit1 : Right elbow.</li> <li>• Bit2 : Both elbow postures (Left elbow, Right elbow).</li> </ul>	<ul style="list-style-type: none"> <li>• Bit0 : Blade 1.</li> <li>• Bit1 : Blade 2.</li> <li>• Bit2 : Both end-effectors (Blade 1, Blade 2).</li> </ul>

Address(PLC)	SPDL_CMD
Info	Execute command after write operation

## SPSV (Registers the position data in the volatile memory to the non-volatile memory.)

휘발성 메모리의 위치 데이터를 비 휘발성 메모리에 등록합니다

### [Conditions]

- The specified unit is under ready state.( 지정된 장치가 준비 상태에 있습니다)
- T.P.'s mode selector switch is set to Host mode (if T.P. is connected).( T.P.의 모드 선택기 스위치가 호스트 모드로 설정됩니다 (T.P.가 연결된 경우).)

Address(SYS)	001096	001098
Info	Transfer station (3 bytes)	Arm Posture (1 byte)
Type	ASCII(3)	BIT
Value	<ul style="list-style-type: none"> <li>• "C01" - "C08" : Cassette stage (the lowest-layer position).</li> <li>• "H01" - "H08" : Cassette stage (the highest-layer position).</li> <li>• "S01" - "S12" : Transfer stage.</li> <li>• "P01" : P/A stage.</li> <li>• "FFF" : All transfer stations.</li> </ul>	<ul style="list-style-type: none"> <li>• Bit0 : Left elbow.</li> <li>• Bit1 : Right elbow.</li> <li>• Bit2 : Both elbow posture (Left elbow, Right elbow).</li> </ul>

Address(SYS)	001099
Info	Blade (1 byte)
Type	BIT
Value	<ul style="list-style-type: none"> <li>• Bit0 : Blade 1.</li> <li>• Bit1 : Blade 2.</li> <li>• Bit2 : Both end-effector (Blade 1, Blade 2).</li> </ul>

Address(PLC)	SPSV_CMD
Info	Execute command after write operation

## SPLD (Reads the position data in the non-volatile memory into the volatile memory.)

비 휘발성 메모리의 위치 데이터를 휘발성 메모리로 읽습니다

**[Conditions]**

- The specified unit is under ready state.( 지정된 장치가 준비 상태에 있습니다)
- T.P.'s mode selector switch is set to Host mode (if T.P. is connected).( T.P.의 모드 선택기 스위치가 호스트 모드로 설정됩니다 (T.P.가 연결된 경우).)

Address(SYS)	001100	001102
Info	Transfer station (3 bytes)	Arm Posture (1 byte)
Type	ASCII(3)	BIT
Value	<ul style="list-style-type: none"> <li>• "C01" - "C08" : Cassette stage (the lowest-layer position).</li> <li>• "H01" - "H08" : Cassette stage (the highest-layer position).</li> <li>• "S01" - "S12" : Transfer stage.</li> <li>• "P01" : P/A stage.</li> <li>• "FFF" : All transfer stations.</li> </ul>	<ul style="list-style-type: none"> <li>• Bit0 : Left elbow.</li> <li>• Bit1 : Right elbow.</li> <li>• Bit2 : Both elbow posture (Left elbow, Right elbow).</li> </ul>

Address(SYS)	001103
Info	Blade (1 byte)
Type	BIT
Value	<ul style="list-style-type: none"> <li>• Bit0 : Blade 1.</li> <li>• Bit1 : Blade 2.</li> <li>• Bit2 : Both end-effector (Blade 1, Blade 2).</li> </ul>

Address(PLC)	SPLD_CMD
Info	Execute command after write operation

## SSTR (Set Transfer Station Information)

전송 스테이션 정보를 설정합니다

### [Conditions]

- The specified unit is under ready state.( 지정된 장치가 준비 상태에 있습니다)
- T.P.'s mode selector switch is set to Host mode (if T.P. is connected).( T.P.의 모드 선택기 스위치가 호스트 모드로 설정됩니다 (T.P.가 연결된 경우).)

Address(SYS)	001104	00105
Info	Memory specification (1 byte)	Transfer station (3 bytes)
Type	BIT	ASCII(3)
Value	<ul style="list-style-type: none"> <li>• Bit0 : Volatile memory.</li> <li>• Bit1 : Volatile memory and Non-volatile memory.</li> </ul>	<ul style="list-style-type: none"> <li>• "C01" - "C08" : Cassette stage.</li> <li>• "S01" - "S12" : Transfer stage.</li> <li>• "P01" : P/A stage.</li> </ul>

Address(SYS)	001107	001108
Info	Transfer station information- Item(2 bytes)	Parameter value (8 bytes)
Type	DEC(16bit)	DEC(32Bit)
Value	<ul style="list-style-type: none"> <li>•See the supplementary explanation.</li> <li>Note) If a value is less than the specified digits, fill the higher digit(s) with '0' so that the field always has specified digits.</li> <li>A sign is added to the highest digit.</li> </ul>	

Item	Contents	Unit	Parameter value
"00"	Downward offset	0.001 [mm]	"-9999999" ~ "99999999"
"01"	Upward offset	0.001 [mm]	"-9999999" ~ "99999999"
"02"	Grip position offset	0.001 [mm]	"-9999999" ~ "99999999"
"06"	G2/P3 Offset in the extending direction	0.001 [mm]	"-9999999" ~ "99999999"
"08"	Put downward offset	0.001 [mm]	"-9999999" ~ "99999999"
"30"	Get operation Move_grip function yes/no	[-]	"00000000" ~ "00000001"
"31"	Get operation rising pattern	[-]	"00000000" ~ "00000001"
"40"	Put operation Move_grip function yes/no	[-]	"00000000" ~ "00000001"
"41"	Put operation dropping pattern	[-]	"00000000" ~ "00000001"

Address(PLC)	SSTR_CMD
Info	Execute command after write operation

## SPRM (Setting of parameter)

지정된 단위의 지정된 매개 변수 값이 변경됩니다

### [Conditions]

- The specified unit is under ready state.( 지정된 장치가 준비 상태에 있습니다)
- T.P.'s mode selector switch is set to Host mode (if T.P. is connected).( T.P.의 모드 선택기 스위치가 호스트 모드로 설정됩니다 (T.P.가 연결된 경우).)
- The specified unit is under servo OFF state.( 지정한 유니트는 서보 OFF 상태입니다)

Address(SYS)	001110	001112
Info	Parameter type (3 bytes)	Parameter number (4 bytes)
Type	ASCII(3)	DEC(16Bit)
Value	<ul style="list-style-type: none"> <li>• "CRU" : Common real number parameter.</li> <li>• "CIU" : Common integer parameter.</li> <li>• "URU" : Unit real number parameter.</li> <li>• "UIU" : Unit integer parameter.</li> </ul>	<p>Note) Specified in the range between "0000" and "9999".</p> <p>If a value is less than the specified digits, fill the higher digit(s) with '0' so that the field always has specified digits.</p>

Address(SYS)	001113
Info	Parameter value (12 bytes, Resolution: 0.0001)
Type	DEC(32Bit)
Value	<p>Note) Specified in the range between "-02147483648" and "002147483647".</p> <p>If a value is less than the specified digits, fill the higher digit(s) with '0' so that the field always has specified digits.</p> <p>A sign is added to the highest digit.</p>

Address(PLC)	SPRM_CMD
Info	Execute command after write operation

## SMSK (Enable/Disable the Interlock monitoring)

인터록 신호 모니터링 기능을 활성화 또는 비활성화합니다

**[Conditions]**

- The specified unit is under ready state.( 지정된 장치가 준비 상태에 있습니다)
- T.P.'s mode selector switch is set to Host mode (if T.P. is connected).( T.P.의 모드 선택기 스위치가 호스트 모드로 설정됩니다)

Address(SYS)	001115
Info	Interlock information (4 bytes)
Type	BIT
Value	See the supplementary explanation.

< Manipulator >

	Bit #	Contents	Setting
Valid1	Bit0	Wafer presence/absence check on Blade 1	0: Enabled, 1: Disabled
	Bit1	Wafer presence/absence check on Blade 2	
	Bit2	Reserved	
	Bit3	Reserved	
Valid2	Bit4	Pre-aligner operation interlock.	
	Bit5	Pre-aligner wafer status interlock.	
	Bit6	Pre-aligner wafer status interlock. Wafer status checked by CCD sensor.	
	Bit7	Reserved	
Valid3	Bit8	Reserved	
	Bit9	Reserved	
	Bit10	Reserved	
	Bit11	Reserved	
Valid4	Bit12	Reserved	
	Bit13	Reserved	
	Bit14	Reserved	
	Bit15	Reserved	

< Pre-aligner >

	Bit #	Contents	Setting
Valid1	Bit0	Wafer presence/absence check.	0: Enabled, 1: Disabled
	Bit1	Reserved.	
	Bit2	Reserved.	
	Bit3	Reserved.	
Valid2	Bit4	Reserved.	
	Bit5	Reserved.	
	Bit6	Reserved.	
	Bit7	Reserved.	
Valid3	Bit8	Reserved.	
	Bit9	Reserved.	
	Bit10	Reserved.	
	Bit11	Reserved.	
Valid4	Bit12	Manipulator operation interlock. Check if the manipulator is accessing pre-aligner.	
	Bit13	Reserved.	
	Bit14	Reserved.	
	Bit15	Reserved.	

Address(PLC)	SMSK_CMD
Info	Execute command after write operation

## SSTD (Reference position record command)

현재 위치는 조작자 좌표의 기준 위치로 등록됩니다

이 명령은 위치를 비 휘발성 메모리에 등록합니다.

### [Conditions]

- The specified unit is under ready state.(지정된 장치가 준비 상태에 있습니다)
- The specified unit is under servo ON state.(지정된 유닛이 서보 ON 상태입니다.)
- T.P.'s mode selector switch is set to Host mode (if T.P. is connected).(T.P.의 모드 선택기 스위치가 호스트 모드로 설정됩니다 (T.P.가 연결된 경우).)

Address(SYS)	001116
Info	Axis (1 byte)
Type	BIT
Value	<ul style="list-style-type: none"> <li>• Bit0 : Arm section only.</li> <li>• Bit1 : Elevation axis.</li> <li>• Bit2 : All axes</li> </ul>

Address(PLC)	SSTD_CMD
Info	Execute command after write operation

## SSTN (Reference position record command (for inputting numerical values))

기준 위치 인코더 값을 지정하고 기준 위치를 기록하십시오  
이 명령은 위치를 비 휘발성 메모리에 등록합니다

### [Conditions]

- The specified unit is under ready state.( 지정된 장치가 준비 상태에 있습니다)
- The specified unit is under servo ON state.( 지정된 유닛이 서보 ON 상태입니다)
- T.P.'s mode selector switch is set to Host mode (if T.P. is connected).( T.P.의 모드 선택기 스위치가 호스트 모드로 설정됩니다 (T.P.가 연결된 경우))

Address(SYS)	001117 ~ 0011125
Info	Reference position of the encoder value (12 bytes each)
Type	DEC(32Bit)
Value	<ul style="list-style-type: none"> <li>• Value1 : Arm1.</li> <li>• Value2 : Arm 2.</li> <li>• Value3 : Wrist axis 1.</li> <li>• Value4 : Wrist axis 2.</li> <li>• Value5 : Elevation axis.</li> </ul> <p>Note) Specified in the range between "-02147483648" and "002147483647". If value is less than 12 digits, fill the higher digit(s) with '0' so that the field always has 12 digits. A sign is added to the highest digit. Note) The number of "ValueN" depends on the unit type. Set as many axis numbers as the specified unit has.</p>

Address(PLC)	SSTN_CMD
Info	Execute command after write operation



## RSPD (Motion speed reference)

지정된 단위의 축의 동작 속도 설정을 나타냅니다. (비 웨이퍼 속도, 웨이퍼 속도, 저속, 원점 복귀 속도, 저속 영역 속도)

이 명령은 휘발성 메모리의 기본 속도 설정을 나타냅니다

### [Conditions]

- T.P.'s mode selector switch is set to Host mode (if T.P. is connected). T.P.의 모드 선택 스위치가 호스트 모드로 설정됩니다 (T.P.가 연결된 경우)

Address(SYS)	001127	001128
Info	Transfer speed level (1 byte)	Speed type (1 byte)
Type	BIT	BIT
Value	<ul style="list-style-type: none"> <li>• Bit0 : Currently set speed level.</li> <li>• Bit1 : Speed level 1.</li> <li>• Bit2 : Speed level 2.</li> <li>• Bit3 : Speed level 3.</li> </ul>	<ul style="list-style-type: none"> <li>• Bit0 : No-wafer speed.</li> <li>• Bit1 : With-wafer speed.</li> <li>• Bit2 : Low speed.</li> <li>• Bit3 : (Alphabet. Not zero.): home return speed.</li> <li>• Bit4 : Speed in low-speed-area.</li> </ul>

Address(SYS)	001129
Info	Axis (1 byte)
Type	BIT
Value	<p>&lt; Manipulator &gt;</p> <ul style="list-style-type: none"> <li>• Bit0 : Rotation axis.</li> <li>• Bit1 : Extension axis.</li> <li>• Bit2 : Wrist axis 1.</li> <li>• Bit3: Wrist axis 2.</li> <li>• Bit4 : Elevation axis.</li> <li>• Bit5 : Linear access motion speed.</li> </ul> <p>&lt; Pre-aligner &gt;</p> <ul style="list-style-type: none"> <li>• Bit0 : Rotation axis.</li> </ul>

Address(SYS)	RSPD_SET
Info	Read after parameter setting
Type	BIT
Value	<ul style="list-style-type: none"> <li>• Bit0 = ON( READ )</li> <li>• Bit0 = OFF( STOP )</li> </ul>

Address(SYS)	RSPD0	RDPD1
Info	Speed data (8 bytes)	Maximum speed data of the specified speed type(8 bytes)
Type	DEC(32Bit)	DEC(32Bit)
Value	<p>Note) Specified in the range between "00000001" and "99999999" (Resolution: 0.001 [mm/sec], [deg/sec]).</p> <p>If a value is less than the specified digits, fill the higher digit(s) with '0' so that the field always has specified digits.</p>	<p>Note) Specified in the range between "00000001" and "99999999" (Resolution: 0.001 [mm/sec], [deg/sec]).</p> <p>If a value is less than the specified digits, fill the higher digit(s) with '0' so that the field always has specified digits.</p>

## RSLV (Transfer Speed Level Reference)

현재 설정된 전송 속도의 속도 수준을 참조하십시오 (웨이퍼 없음 속도, 웨이퍼 속도, 낮음속도, 원점 복귀 속도, 저속 영역 속도)를 설정합니다

컨트롤러 전원이 순환되면 높은 속도 프로필이 선택됩니다 (기본값).

### [Conditions]

None.

Address(PLC)	RSLV0
Info	Transfer speed level (1 byte)
Type	DEC(16Bit)
Value	<ul style="list-style-type: none"> <li>• '1' : Speed level 1.</li> <li>• '2' : Speed level 2.</li> <li>• '3' : Speed level 3.</li> </ul>



## RPOS (Reference Current Position)

지정된 단위의 현재 위치 참조

### [Conditions]

The specified unit is under servo ON state.( 지정된 유닛이 서보 ON 상태 임)

Address(SYS)	001130
Info	Position data type (1 byte)
Type	BIT
Value	<ul style="list-style-type: none"> <li>• Bit0 : Command position.</li> <li>• Bit1 : Feedback position.</li> </ul>

Address(PLC)	RPOS0 ~ RPOS4
Info	Coordinate (8 bytes each, Resolution: 0.001 [mm]/[deg])
Type	DEC(32Bit)
Value	<p>Note) Specified in the range between "-9999999" and "99999999".</p> <p>If a value is less than the specified digits, fill the higher digit(s) with '0' so that the field always has specified digits.</p> <p>A sign is added to the highest digit.</p> <p>Note) Response for all axes of specified unit.</p>

Address(SYS)	RPOS_SET
Info	Read after parameter setting
Type	BIT
Value	<ul style="list-style-type: none"> <li>• Bit0 = ON( READ )</li> <li>• Bit0 = OFF( STOP )</li> </ul>

## RSTP (Reference Registered Position)

지정된 단위의 등록 된 위치 참조

### [Conditions]

- T.P.'s mode selector switch is set to Host mode (if T.P. is connected).( T.P.의 모드 선택기 스위치가 호스트 모드로 설정됩니다 (T.P.가 연결된 경우).)
- The specified transfer station has been registered.( 지정된 전송 스테이션이 등록되었습니다)

Address(SYS)	001131	001132
Info	Memory specification (1 byte)	Transfer station (3 bytes)
Type	BIT	ASCII(3)
Value	<ul style="list-style-type: none"> <li>• Bit0 : Volatile memory.</li> <li>• Bit1 : Non-volatile memory.</li> </ul>	<ul style="list-style-type: none"> <li>• "C01" - "C08" : Cassette stage (the lowest-layer position).</li> <li>• "H01" - "H08" : Cassette stage (the highest-layer position).</li> <li>• "S01" - "S12" : Transfer stage.</li> <li>• "P01" : P/A stage.</li> </ul>

Address(SYS)	001134	001135
Info	Slot number (2 bytes)	Arm Posture (1 byte)
Type	DEC(16Bit)	BIT
Value	<p>&lt;Cassette stage&gt;</p> <ul style="list-style-type: none"> <li>• "01" - "30" : If &lt;TrsSt&gt; is "C01"- "C08"(cassette stage), set the slot.</li> <li>• "00" : If &lt;TrsSt&gt; is "H01"- "H08"(cassette stage), recognize the highest-layer position.</li> </ul> <p>&lt;Transfer stage, Pre-aligner stage&gt;</p> <ul style="list-style-type: none"> <li>• "00" : Fixed value t(because this type of station does not have multiple slots.)</li> </ul> <p>Note) If value is less than 2 digits, fill the higher digit with '0' so that the field always has 2 digits.</p>	<ul style="list-style-type: none"> <li>• Bit0 : Left elbow.</li> <li>• Bit1 : Right elbow.</li> </ul>

Address(SYS)	001136	001137
Info	Blade (1 byte)	Position type (1 byte)
Type	BIT	BIT
Value	<ul style="list-style-type: none"> <li>• Bit0 : Blade 1.</li> <li>• Bit1 : Blade 2.</li> </ul>	<ul style="list-style-type: none"> <li>• Bit0 : Registered position.</li> <li>• Bit1 : Ready position.</li> <li>• Bit2 : Intermediate position.</li> <li>• Bit3 : Mapping start position.</li> <li>• Bit4 : Mapping finish position.</li> </ul> <p>Note) For a mapping start/finish position, slot number and blade number specifications are ignored.</p> <p>Note) If &lt;Mem&gt; is N(Non-volatile memory), specified 'S'</p>

Address(PLC)	RSTP0 ~ RSTP4
Info	Coordinate (8 bytes each, Resolution: 0.001 [mm]/[deg])
Type	DEC(32Bit)
Value	<p>Note) Specified in the range between "-9999999" and "99999999".</p> <p>If a value is less than the specified digits, fill the higher digit(s) with '0' so that the field always has specified digits.</p> <p>A sign is added to the highest digit.</p> <p>Note) Response for all axes of the specified unit</p>

Address(SYS)	RSTP_SET
Info	Read after parameter setting
Type	BIT
Value	<ul style="list-style-type: none"> <li>• Bit0 = ON( READ )</li> <li>• Bit0 = OFF( STOP )</li> </ul>



## RSTR (Reference Transfer station information)

stations information 참조

[Conditions]

None.

Address(SYS)	001138	001139
Info	Memory specification (1 byte)	Transfer station (3 bytes)
Type	BIT	ASCII(3)
Value	<ul style="list-style-type: none"> <li>• Bit0 : Volatile memory.</li> <li>• Bit1 : Non-volatile memory.</li> </ul>	<ul style="list-style-type: none"> <li>• "C01" - "C08" : Cassette stage.</li> <li>• "S01" - "S12" : Transfer stage.</li> <li>• "P01" : P/A stage.</li> </ul>

Address(SYS)	001141
Info	Transfer station information - Item (2 bytes)
Type	DEC(16Bit)
Value	<ul style="list-style-type: none"> <li>• See the supplementary explanation.</li> </ul>

Item	Contents
"00"	Downward offset
"01"	Upward offset
"02"	Grip position offset
"06"	G2/P3 Offset in the extending direction
"08"	Put downward offset
"30"	Get operation Move_grip function yes/no
"31"	Get operation rising pattern
"40"	Put operation Move_grip function yes/no
"41"	Put operation dropping pattern
"10"	Slot numbers
"30"	Slot pitch(Left elbow, Blade1)
"31"	Slot pitch(Left elbow, Blade2)
"32"	Slot pitch(Right elbow, Blade1)
"33"	Slot pitch(Right elbow, Blade2)



Address (PLC)	RSTR			
Info	Parameter value (8 bytes)			
Type	DEC(32Bit)			
Value	Item	Contents	Unit	Setting Range
	"00"	Downward offset	0.001 [mm]	"-9999999" - "99999999"
	"01"	Upward offset	0.001 [mm]	"-9999999" - "99999999"
	"02"	Grip position offset	0.001 [mm]	"-9999999" - "99999999"
	"06"	G2/P3 Offset in the extending direction	0.001 [mm]	"-9999999" - "99999999"
	"08"	Put downward offset	0.001 [mm]	"-9999999" - "99999999"
	"30"	Get operation Move_grip function yes/no	[-]	"00000000"□"00000001"
	"31"	Get operation rising pattern	[-]	"00000000"□"00000001"
	"40"	Put operation Move_grip function yes/no	[-]	"00000000"□"00000001"
	"41"	Put operation dropping pattern	[-]	"00000000"□"00000001"
	"10"	Slot numbers	[-]	"00000001"□"00000030"
	"30"	Slot pitch(Left elbow, Blade1)	0.001[mm]	"-9999999"□"99999999"
	"31"	Slot pitch(Left elbow, Blade2)	0.001[mm]	"-9999999"□"99999999"
	"32"	Slot pitch(Right elbow, Blade1)	0.001[mm]	"-9999999"□"99999999"
	"33"	Slot pitch(Right elbow, Blade2)	0.001[mm]	"-9999999"□"99999999"
<p>Note) If a value is less than the specified digits, fill the higher digit(s) with '0' so that the field always has specified digits. A sign is added to the highest digit.</p>				

Address(SYS)	RSTR_SET
Info	Read after parameter setting
Type	BIT
Value	<ul style="list-style-type: none"> <li>• Bit0 = ON( READ )</li> <li>• Bit0 = OFF( STOP )</li> </ul>



## RPRM (Reference Parameter)

지정된 단위의 매개 변수 값 참조

**[Conditions]**

None.

Address(SYS)	001142	001144
Info	Parameter type (3 bytes)	Parameter number (4 bytes)
Type	ASCII(3)	DEC(16Bit)
Value	<ul style="list-style-type: none"> <li>• "CRU" : Common real number parameter.</li> <li>• "CIU" : Common integer parameter.</li> <li>• "URU" : Unit real number parameter.</li> <li>• "UIU" : Unit integer parameter.</li> </ul>	<p>Note) Specified in the range between "0000" and "9999".</p> <p>If a value is less than the specified digits, fill the higher digit(s) with '0' so that the field always has specified digits.</p>

Address(PLC)	RPRM
Info	Parameter value (12 bytes, Resolution: 0.0001)
Type	DEC(32Bit)
Value	<p>Note) The range is between "-02147483648" and "002147483647".</p> <p>If a value is less than the specified digits, fill the higher digit(s) with '0' so that the field always has specified digits.</p> <p>A sign is added to the highest digit.</p>

Address(SYS)	RPRM_SET
Info	Read after parameter setting
Type	BIT
Value	<ul style="list-style-type: none"> <li>• Bit0 = ON( READ )</li> <li>• Bit0 = OFF( STOP )</li> </ul>



## RSTS (Reference Status)

various statuses 참조

[Conditions]

None.

Address(PLC)	RSTS0
Info	Status information (4 bytes)
Type	BIT
Value	• Refer to the supplementary explanation.

< Manipulator >

	Bit #	Contents		
Status1	Bit0	Wafer presence status on Blade 1	No Wafer	Wafer present
	Bit1	Wafer presence status on Blade 2		
	Bit2	Blade 1 solenoid chucking command status	Wafer grip	Wafer release
	Bit3	Blade 2 solenoid chucking command status		
Status2	Bit4	Interlock 1 signal status (Optional)	Operation prohibited	Operation permitted
	Bit5	Interlock 2 signal status (Optional)		
	Bit6	Interlock 3 signal status (Optional)		
	Bit7	Interlock 4 signal status (Optional)		
Status3	Bit8	Interlock 5 signal status (Optional)		
	Bit9	Interlock 6 signal status (Optional)		
	Bit10	Interlock 7 signal status (Optional)		
	Bit11	Interlock 8 signal status (Optional)		
Status4	Bit12	Reserved	-	-
	Bit13	Reserved		
	Bit14	Reserved		
	Bit15	Reserved		

< Pre-aligner >

	Bit #	Contents		
Status1	Bit0	Vacuum status	No wafer	Wafer present
	Bit1	Wafer presence status (CCD sensor)		
	Bit2	Solenoid chucking command status	Wafer hold	Wafer release
	Bit3	Reserved		
Status2	Bit4	Reserved	-	-
	Bit5	Reserved		
	Bit6	Reserved		
	Bit7	Reserved		
Status3	Bit8	Reserved		
	Bit9	Reserved		
	Bit10	Reserved		
	Bit11	Reserved		
Status4	Bit12	Reserved		
	Bit13	Reserved		
	Bit14	Reserved		
	Bit15	Reserved		



## RERR (Reference Error History)

지정된 장치의 오류 기록 참조

### [Conditions]

None.

Address(SYS)	001145	001146
Info	Memory (1 byte)	Error history number (3 bytes)
Type	BIT	HEX(16Bit)
Value	<ul style="list-style-type: none"> <li>• Bit0 : Volatile memory.</li> <li>• Bit1 : Non-volatile memory.</li> </ul>	<ul style="list-style-type: none"> <li>• "FFF" : Notify all error history (latest 32 records notified).</li> <li>• "000" - "127" : Notifies the details of the specified error history number ("000" is the latest error code).</li> </ul>

Notify all error history

Address(PLC)	RERR00 ~ RERR31
Info	Notify all error history-Error code (4 bytes)
Type	DEC(16Bit)
Value	Note) The smaller the value of N, the newer the error code. If no errors have occurred, "0000" is responded.

Notify specified error history number details

Address(PLC)	RERR00 ~ RERR08
Info	Notify specified error history number details - Error code (4 bytes), Servo error code (3 bytes), Sub-error code (5 bytes), Time occurred (12 bytes)
Type	DEC(16Bit)
Value	Error code (4 bytes) <ul style="list-style-type: none"> <li>• If no errors have occurred, "0000" is responded.</li> </ul> Servo error code (3 bytes) <ul style="list-style-type: none"> <li>• If no errors have occurred, "0000" is responded.</li> </ul> Sub-error code (5 bytes) <ul style="list-style-type: none"> <li>• If no errors have occurred, "0000" is responded.</li> </ul> Time occurred (12 bytes)                     Note) "Year/Month/Day/Hour/Minute/Second" format responded (2 bytes each). If no errors have occurred, "000000000000" is responded.

Address(SYS)	RERR_SET
Info	Read after parameter setting
Type	BIT
Value	<ul style="list-style-type: none"> <li>• Bit0 = ON( READ )</li> <li>• Bit0 = OFF( STOP )</li> </ul>



## RMSK (Reference Interlock Monitoring Enable/Disable Information)

### Interlock Monitoring 정보 참조

#### [Conditions]

None.

Address(PLC)	RMSK0
Info	Interlock information (4 bytes)
Type	DEC(16Bit)
Value	• See the supplementary explanation.

#### < Manipulator >

	Bit #	Contents	Setting
Valid1	Bit0	Wafer presence/absence check on Blade 1	0: Enabled, 1: Disabled
	Bit1	Wafer presence/absence check on Blade 2	
	Bit2	Reserved	
	Bit3	Reserved	
Valid2	Bit4	Pre-aligner operation interlock.	
	Bit5	Pre-aligner wafer status interlock.	
	Bit6	Pre-aligner wafer status interlock. Wafer status checked by CCD sensor.	
	Bit7	Reserved	
Valid3	Bit8	Reserved	
	Bit9	Reserved	
	Bit10	Reserved	
	Bit11	Reserved	
Valid4	Bit12	Reserved	
	Bit13	Reserved	
	Bit14	Reserved	
	Bit15	Reserved	

#### < Pre-aligner >

	Bit #	Contents	Setting
Valid1	Bit0	Wafer presence/absence check.	0: Enabled, 1: Disabled
	Bit1	Reserved.	
	Bit2	Reserved.	
	Bit3	Reserved.	
Valid2	Bit4	Reserved.	
	Bit5	Reserved.	
	Bit6	Reserved.	
	Bit7	Reserved.	
Valid3	Bit8	Reserved.	
	Bit9	Reserved.	
	Bit10	Reserved.	
	Bit11	Reserved.	
Valid4	Bit12	Manipulator operation interlock. Check if the manipulator is accessing pre-aligner.	
	Bit13	Reserved.	
	Bit14	Reserved.	
	Bit15	Reserved.	

## RVER (Reference Software Version)

software version 참조

**[Conditions]**

None.

Address(PLC)	RVER0	RVER1
Info	System software version (8 bytes)	Servo software version(8 bytes)
Type	DEC(32Bit)	DEC(32Bit)
Value		

## RMAP (Reference Mapping Result)

지정된 전송 스테이션의 매핑 결과 참조

**[Conditions]**

- T.P.'s mode selector switch is set to Host mode (if T.P. is connected).( T.P.의 모드 선택기 스위치가 호스트 모드로 설정됩니다 (T.P.가 연결된 경우).)
- The mapping operation has completed normally.( 매핑 작업이 정상적으로 완료되었습니다)

Address(PLC)	RMAP0 ~ RMAPN
Info	Mapping result (2 bytes each)
Type	ASCII(2)
Value	<ul style="list-style-type: none"> <li>• "--" : No wafer detected.</li> <li>• "OK" : Wafer inserted correctly.</li> <li>• "CW" : Wafer inserted incorrectly (inclined).</li> <li>• "DW" : Wafer inserted incorrectly (duplicated).</li> </ul> Note) Responds with the number of slots of the specified transfer station.

Address(SYS)	RMAP_SET
Info	Read after parameter setting
Type	BIT
Value	<ul style="list-style-type: none"> <li>• Bit0 = ON( READ )</li> <li>• Bit0 = OFF( STOP )</li> </ul>

## RMPD (Reference Mapping Data)

(센서 에지 시작 / 정지 중 고도 축 좌표 값)

지정된 전송 스테이션에 대한 매핑이 실행됩니다

### [Conditions]

- T.P.'s mode selector switch is set to Host mode (if T.P. is connected).( T.P.의 모드 선택기 스위치가 호스트 모드로 설정됩니다 (T.P.가 연결된 경우))
- Mapping operations have completed normally.( 매핑 작업이 정상적으로 완료되었습니다)

Address(PLC)	RMPD_UP00 ~ RMPD_UP30
Info	Sensor edge startup elevation axis coordinates (8 bytes, Resolution: 0.001 [mm])
Type	DEC(32Bit)
Value	Note) The range is between "-9999999" and "99999999". If a value is less than the specified digits, fill the higher digit(s) with '0' so that the field always has specified digits.

Address(PLC)	RMPD_DN00 ~ RMPD_DN30
Info	Sensor edge stopping elevation axis coordinates (8 bytes, Resolution: 0.001[mm])
Type	DEC(32Bit)
Value	Note) The range is between "-9999999" and "99999999". If a value is less than the specified digits, fill the higher digit(s) with '0' so that the field always has specified digits. Note) Updata and Dndata always responds with 30 sets of data. Data is responded as it is detected, and if 30 sets are not detected, "00000000" is responded. The slot no. and the data no. may not match.

Address(SYS)	RMPD_SET
Info	Read after parameter setting
Type	BIT
Value	• Bit0 = ON( READ ) • Bit0 = OFF( STOP )

## RMCA (Reference Calibration Result for Mapping)

### Mapping 보정 결과 참조

**[Conditions]**

- Calibration operation for mapping has completed normally.( 매핑을위한 보정 작업이 정상적으로 완료되었습니다)

Address(PLC)	RMCA0 ~ RMCA5
Info	Reference Calibration Result for Mapping
Type	DEC(32Bit)
Value	<ul style="list-style-type: none"> <li>• Value1 : Lowest-layer slot position (8 bytes, Resolution: 0.001 [mm])</li> <li>• Value2 : Highest-layer slot position (8 bytes, Resolution: 0.001 [mm])</li> <li>• Value3 : Wafer width (8 bytes, Resolution: 0.001 [mm])</li> <li>• Value4 : The threshold value of double insertion (8 bytes, Resolution: 0.001 [mm])</li> <li>• Value5 : The threshold value of slanting insertion1 (8 bytes, Resolution: 0.001 [mm])</li> <li>• Value6 : The threshold value of slanting insertion2 (8 bytes, Resolution: 0.001 [mm])</li> </ul> <p>Note) The range is between "-9999999" and "99999999". If value is less than 8 digits, fill the higher digit(s) with '0' so that the field always has 8 digits.</p>

Address(SYS)	RMCA_SET
Info	Read after parameter setting
Type	BIT
Value	<ul style="list-style-type: none"> <li>• Bit0 = ON( READ )</li> <li>• Bit0 = OFF( STOP )</li> </ul>

## RALN (Reference Alignment Result)

### 정렬 결과 참조

#### [Conditions]

- T.P.'s mode selector switch is set to Host mode (if T.P. is connected).( T.P.의 모드 선택기 스위치가 호스트 모드로 설정됩니다 (T.P.가 연결된 경우))
- Alignment has been completed normally.( 정렬이 정상적으로 완료되었습니다)

Address(PLC)	RALN0 ~ RALN9
Info	Reference Alignment Result
Type	DEC(32Bit)
Value	<ul style="list-style-type: none"> <li>• Value1 : Wafer eccentricity before alignment operation (8 bytes, Resolution: 0.001 [mm])</li> <li>• Value2 : Wafer eccentricity direction before alignment operation (8 bytes, Resolution: 0.001 [deg])</li> <li>• Value3 : Notch/Orientation Flat direction before alignment operation (8 bytes, Resolution: 0.001 [deg])</li> <li>• Value4 : X direction offset amount before alignment operation (8 bytes, Resolution: 0.001 [mm])</li> <li>• Value5 : Y direction offset amount before alignment operation (8 bytes, Resolution: 0.001 [mm])</li> <li>• Value6 : Pre-aligner adjustment angle (8 bytes, Resolution: 0.001 [deg])</li> <li>• Value7 : Manipulator adjustment amount (8 bytes, Resolution: 0.001 [mm])</li> <li>• Value8 : Manipulator adjustment angle (8 bytes, Resolution: 0.001 [deg])</li> <li>• Value9 : X direction offset amount after alignment operation (8 bytes, Resolution: 0.001 [mm])</li> <li>• Value10 : Y direction offset amount after alignment operation (8 bytes, Resolution: 0.001 [mm])</li> <li>• Refer to the Supplementary Explanation</li> </ul> <p>Note) If a value is less than the specified digits, fill the higher digit(s) with '0' so that the field always has specified digits.</p>

## RACA (Reference Calibration Result for Alignment)

### 정렬 교정 결과 참조

#### [Conditions]

Calibration for alignment has finished normally.( 정렬을 위한 보정이 정상적으로 완료되었습니다)

Address(PLC)	RACA0 ~ RACA2
Info	Reference Calibration Result for Alignment
Type	DEC(32Bit)
Value	<ul style="list-style-type: none"> <li>• Value1 : Calibration angle (8 bytes, Resolution: 0.001 [deg])</li> <li>• Value2 : Manipulator advance angle (8 bytes, Resolution: 0.001 [deg])</li> <li>• Value3 : Manipulator swivel center to pre-aligner swivel center distance (8 bytes, Resolution: 0.001 [mm])</li> </ul> <p>Note) If a value is less than the specified digits, fill the higher digit(s) with '0' so that the field always has specified digits.</p>

## RCCD (Reference Light Amount and CCD Sensor Values)

pre-aligner 광량 및 CCD 센서 값 참조

**[Conditions]**

None.

Address(PLC)	RCCD0	RCCD1
Info	Light amount value (5 bytes)	CCD sensor value (5 bytes)
Type	DEC(32Bit)	DEC(32Bit)
Value	Note) Specified in the range between "00000" and "99999". If a value is less than the specified digits, fill the higher digit(s) with '0' so that the field always has specified digits.	Note) Specified in the range between "00000" and "99999". If a value is less than the specified digits, fill the higher digit(s) with '0' so that the field always has specified digits.

## RLOG (Reference Log Information)

### 지정된 로그 정보 참조

**[Conditions]**

None

Address(PLC)	RLOG0
Info	Log data (Variable byte)
Type	DEC(32Bit)
Value	• Refer to the supplementary explanation.

Log Number (LogNo)	Contents	Log Data (LogDat)
"00"	Power On times (6 bytes) (Accumulated no. of times)	• Specified in the range between "000000" and "999999".
"01"	Servo On times (6 bytes) (Accumulated no. of times)	• Specified in the range between "000000" and "999999".
"02"	Brake times (6 bytes) (Accumulated no. of times)	• Specified in the range between "000000" and "999999".

Address(SYS)	RLOG_SET
Info	Read after parameter setting
Type	BIT
Value	• Bit0 = ON( READ ) • Bit0 = OFF( STOP )

## RSTN (Reference the Reference Position)

### 참조 위치 참조

**[Conditions]**

None

Address(PLC)	RSTN0 ~ RSTN5
Info	Reference position of the encoder value (12 bytes each)
Type	DEC(32Bit)
Value	<ul style="list-style-type: none"> <li>• Value1 : Arm 1.</li> <li>• Value2 : Arm 2.</li> <li>• Value3 : Wrist axis 1.</li> <li>• Value4 : Wrist axis 2.</li> <li>• Value5 : Elevation axis.</li> </ul> <p>Note) Specified in the range between "-02147483648" and "002147483647".            If a value is less than the specified digits, fill the higher digit(s) with '0' so that the field always has specified digits.            A sign is added to the highest digit.            Note) The number of "ValueN" depends on the unit type. Set as many axis numbers as the specified unit has.</p>