

자동운전

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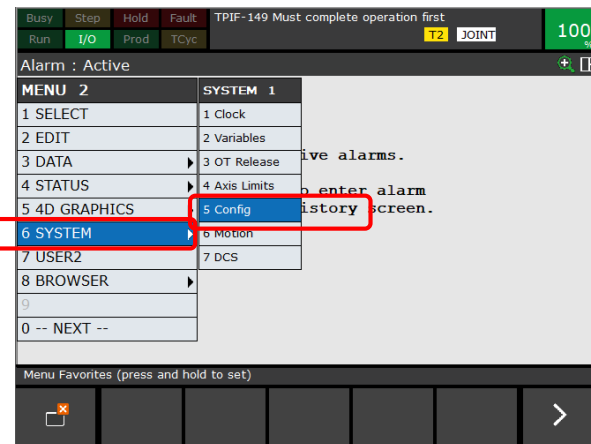
자동 운전 조건 만들기

1. System_Config 설정
2. 펜던트 OFF / Auto 모드로 변경
3. I/O 신호, 로봇 준비 조건 만들기
4. I/O 신호, PNS 자동 운전 신호 만들기
5. I/O 신호, RSR 자동 운전 신호 만들기

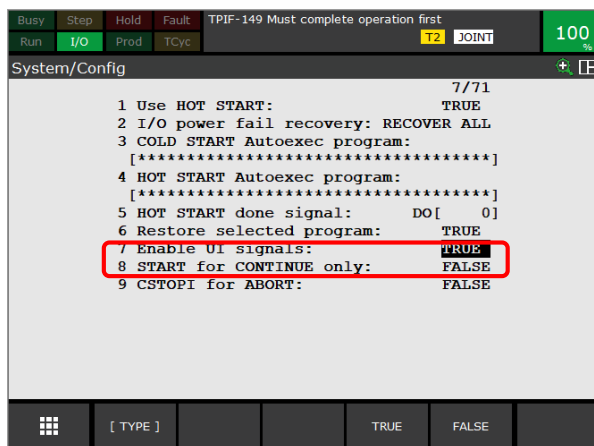
1. System_Config 설정하기



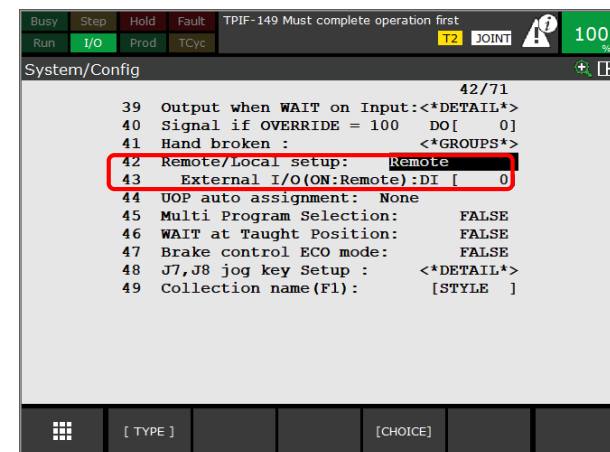
펜던트의 [MENU] 누르기



System -> Config 클릭



“Enalbe UI signals”를 TRUE 로 변경



“Remote/Local setup”를 Remote 로 변경

2. 펜던트 OFF / Auto 모드



펜던트 상단 스위치, OFF 로 변경

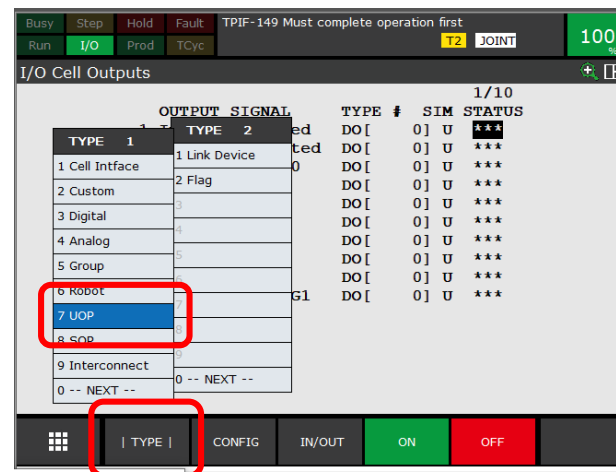


컨트롤러 박스의 스위치, AUTO 모드로 변경

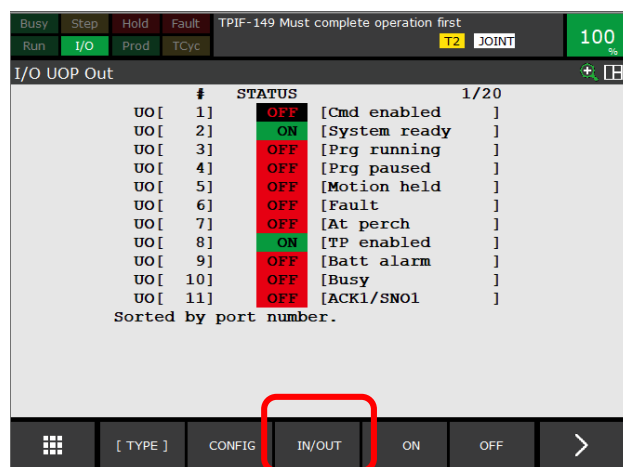
3. IO 신호, 로봇 준비 조건



펜던트의 [I/O] 누르기



TYPE -> UOP



UO가 나오면, IN/OUT 눌러 UI로 변경



UI신호 1,2,3,8번이 ON 되어 있어야 로봇 준비 완료됨.

3. IO 신호, 로봇 준비 조건

IO 신호 설명

UI[1]	IMSTP	상시 ON *4
UI[2]	HOLD	사용 가능
UI[3]	SFSPD	상시 ON *4
UI[4]	CSTOP1	RESET 과 같은 신호에 할당 *1
UI[5]	RESET	사용 가능
UI[6]	START	사용 가능
UI[7]	HOME	할당 없음
UI[8]	ENBL	사용 가능
UI[9]	RSR1/PNS1/STYLE1	PNS1 도 사용 가능 *3
UI[10]	RSR2/PNS2/STYLE2	PNS2 로 사용 가능 *3
UI[11]	RSR3/PNS3/STYLE3	PNS3 으로 사용 가능 *3
UI[12]	RSR4/PNS4/STYLE4	PNS4 로 사용 가능 *3
UI[13]	RSR5/PNS5/STYLE5	할당 없음
UI[14]	RSR6/PNS6/STYLE6	할당 없음
UI[15]	RSR7/PNS7/STYLE7	할당 없음
UI[16]	RSR8/PNS8/STYLE8	할당 없음
UI[17]	PNSTROBE	START 와 같은 신호에 할당 *2
UI[18]	PROD_START	할당 없음 *5

UI[1] : *IMSTP

- 즉시 정지 신호.
OFF가 되면, 알람을 발생시켜 서보 전원을 끊어주며, 로봇 동작을 즉시 정지시켜줌.

UI[2] : *HOLD

- 외부장치를 통한 일시정지 신호.
OFF가 되면, 로봇을 감속 정지시키며 프로그램 중단시킴.

UI[3] : *SFSPD

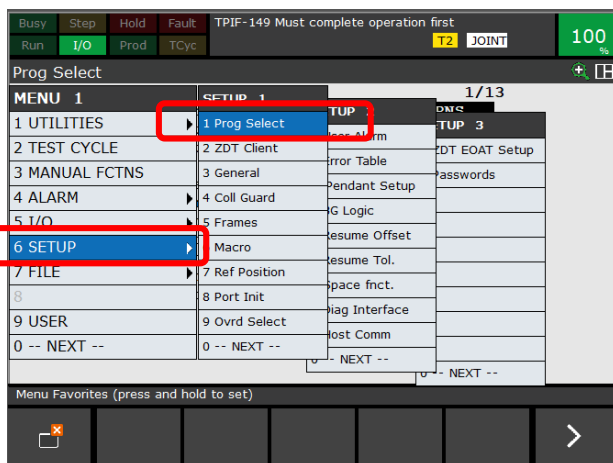
- 안전 속도 신호.
안전 펜스 문이 개방되었을 때 로봇을 일시정지시킴.
일반적으로 안전 펜스의 안전 플러그와 연결됨.

UI[8] : ENBL

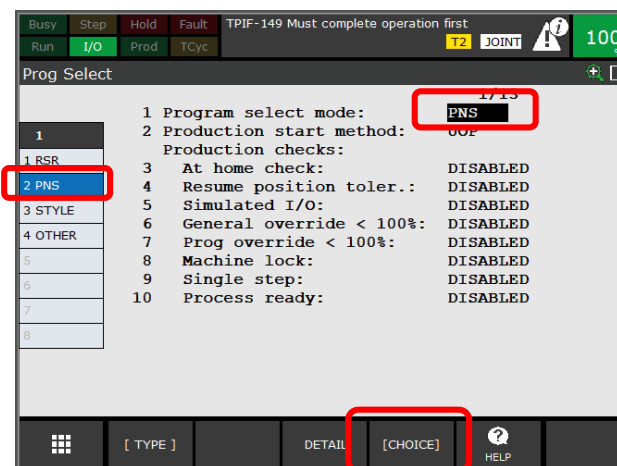
- 동작 허가 신호.
OFF가 되면, 조그 이송(수동조작) 또는 로봇의 동작이 포함된 프로그램 기동 금지됨.

4. IO 신호, PNS 자동 운전 신호 만들기

PNS 자동 운전



[Menu] -> SETUP -> Prog Select



Program select mode로 가서 옮기기
-> CHOICE -> PNS 선택
-> PNS로 바뀐 후, DEATIL 누르기



Base 번호는 임의의 숫자 가능.
(본 매뉴얼에서는 예시로 100 입력)

설정 완료 후,
전원 OFF/ON

4. IO 신호, PNS 자동 운전 신호 만들기

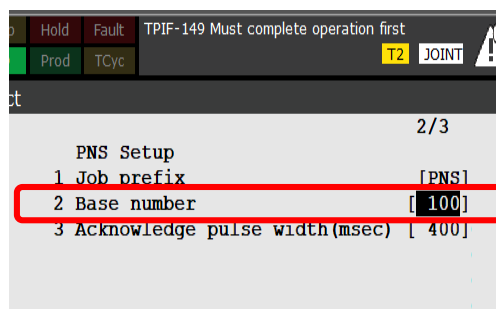
PNS 프로그램 선택하기

1) PNS 번호

UI[8]	ENBL
UI[9]	RSR1/PNS1/STYLE1
UI[10]	RSR2/PNS2/STYLE2
UI[11]	RSR3/PNS3/STYLE3
UI[12]	RSR4/PNS4/STYLE4
UI[13]	RSR5/PNS5/STYLE5
UI[14]	RSR6/PNS6/STYLE6
UI[15]	RSR7/PNS7/STYLE7
UI[16]	RSR8/PNS8/STYLE8
UI[17]	PNSTROBE
UI[18]	PROD_START

PNS1~8 신호를 10진수로 변환하여 PNS번호가 됨

2) Base 번호



앞장에서 설정한 Base번호

3) PNS 프로그램 번호

Select	All	1004900 bytes free	23/32
No.	Program name	Comment	
19	IRVTYPE	VR [
20	M72L_ARC	PC [Set Special weav]	
21	M72L_HEM	PC [Set Special Hem]	
22	MTPARAM	VR [
23	PNS0001	[
24	REQMENU	MR [Request PC Menu]	
25	SENDDATA	MR [Send PC Data]	
26	SENDEVNT	MR [Send PC Event]	
27	SENDSYSV	MR [Send PC SysVar]	
28	SWIUPDT	VR [

PNS #####

PNS1~8 신호를 받아,
일치하는 PNS프로그램을 선택함
(선택만 되었을 뿐, 실행되지 않음)

PNS1
PNS2 On
PNS3 On
PNS4
PNS5
PNS6 On
PNS7
PNS8

00100110
2진수

38
PNS번호

38
PNS 번호



100
BASE 번호



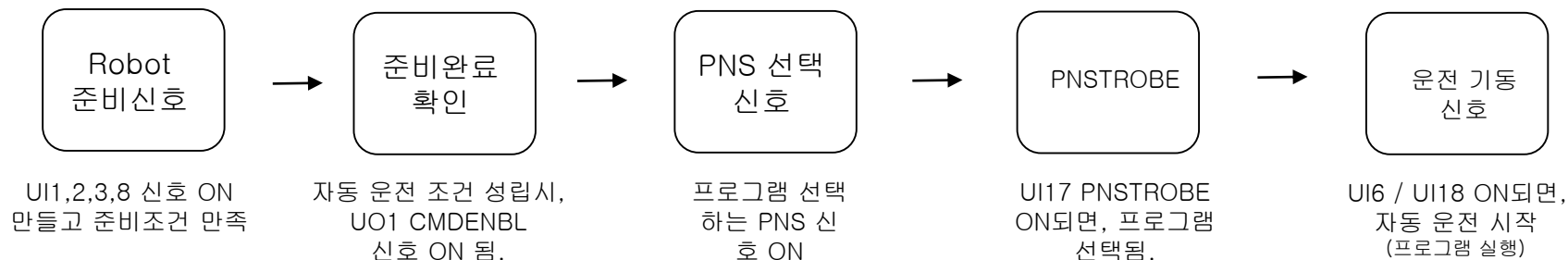
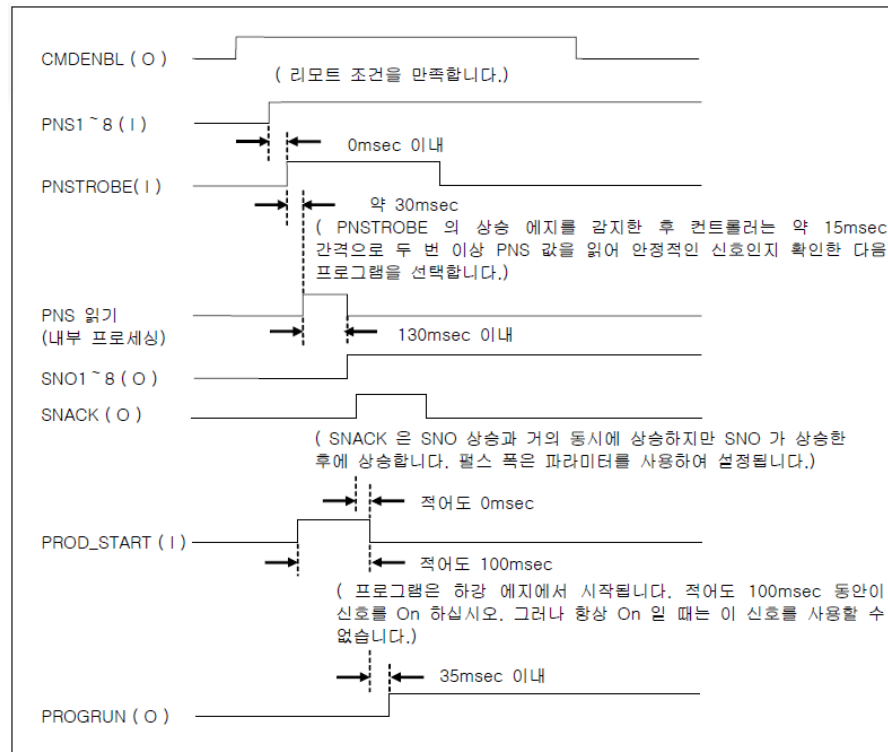
0138
PNS 프로그램 번호

'PNS0138' 선택 됨
(선택만 되었을 뿐, 실행되지 않음)

4. IO 신호, PNS 자동 운전 신호 만들기

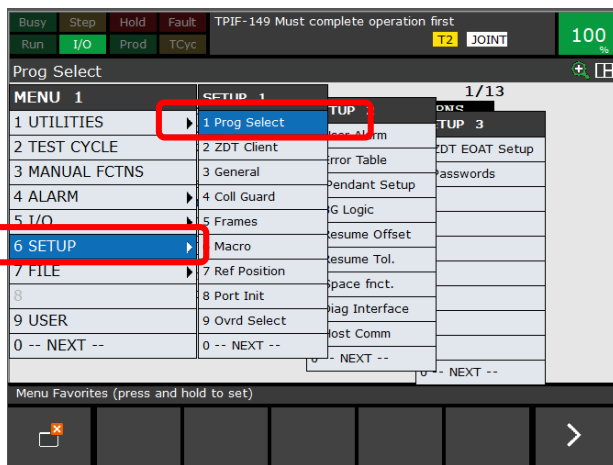
PNS, Flow chart

UI[1]	IMSTP	상시 ON *4
UI[2]	HOLD	사용 가능
UI[3]	SFSPD	상시 ON *4
UI[4]	CSTOP	RESET 과 같은 신호에 할당 *1
UI[5]	RESET	사용 가능
UI[6]	START	사용 가능
UI[7]	HOME	할당 없음
UI[8]	ENBL	사용 가능
UI[9]	RSR1/PNS1/STYLE1	PNS1 로 사용 가능 *3
UI[10]	RSR2/PNS2/STYLE2	PNS2 로 사용 가능 *3
UI[11]	RSR3/PNS3/STYLE3	PNS3 으로 사용 가능 *3
UI[12]	RSR4/PNS4/STYLE4	PNS4 로 사용 가능 *3
UI[13]	RSR5/PNS5/STYLE5	할당 없음
UI[14]	RSR6/PNS6/STYLE6	할당 없음
UI[15]	RSR7/PNS7/STYLE7	할당 없음
UI[16]	RSR8/PNS8/STYLE8	할당 없음
UI[17]	PNSTROBE	START 와 같은 신호에 할당 *2
UI[18]	PROD_START	할당 없음 *5

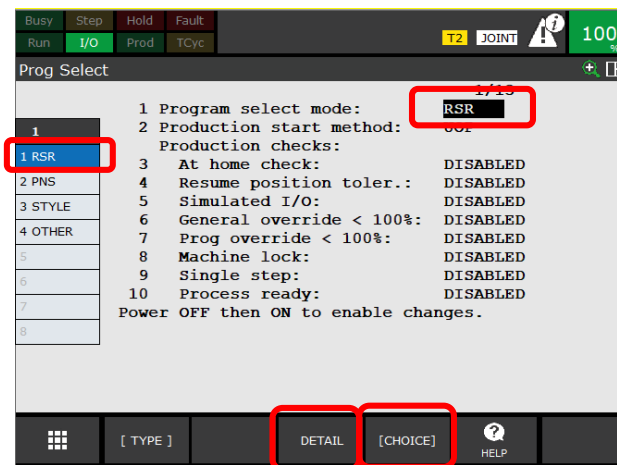


5. IO 신호, RSR 자동 운전 신호 만들기

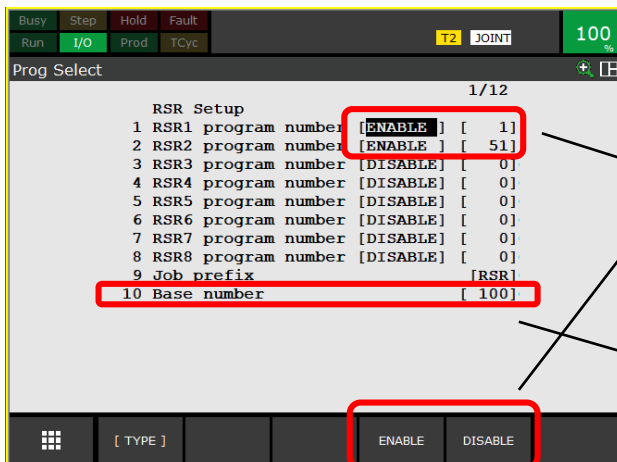
RSR 자동 운전



[Menu] -> SETUP -> Prog Select



1. Program select mode로 커서 옮기기
-> CHOICE -> RSR 선택
-> RSR로 바뀐 후, DEATIL 누르기



ENABLE로 변경 후,
원하는 숫자를 입력

Base 번호는 임의의 숫자 가능.
(본 매뉴얼에서는 예시로 100 입력)

**** RSR 선택이 안되는 경우****
IO가 간략할 당인 경우, RSR선택하여 재전원을 넣어도, PNS로 돌아가는 경우가 있음
-> 할당된 UI17(PNSTROBE)를 삭제할 것

설정 완료 후,
전원 OFF -> ON

5. IO 신호, RSR 자동 운전 신호 만들기

RSR 프로그램 선택하기

RSR Setup		
1 RSR1 program number	[ENABLE]	[1]
2 RSR2 program number	[ENABLE]	[51]
3 RSR3 program number	[DISABLE]	[0]
4 RSR4 program number	[DISABLE]	[0]
5 RSR5 program number	[DISABLE]	[0]
6 RSR6 program number	[DISABLE]	[0]
7 RSR7 program number	[DISABLE]	[0]
8 RSR8 program number	[DISABLE]	[0]
9 Job prefix	[RSR]	
10 Base number	[100]	

1. RSR1~RSR8 중, 필요한 RSR을 ENABLE(활성화) 시킨다.
2. RSR번호에 임의의 번호를 입력한다.
3. RSR 프로그램 번호 = Base 번호 + RSR 번호
4. RSR 신호가 들어오면,
입력된 RSR에 맞는 RSR 프로그램이 실행됨.

5. IO 신호, RSR 자동 운전 신호 만들기

RSR 프로그램 선택하기

UI[8]	ENBL
UI[9]	RSR1/PNS1/STYLE1
UI[10]	RSR2/PNS2/STYLE2
UI[11]	RSR3/PNS3/STYLE3
UI[12]	RSR4/PNS4/STYLE4
UI[13]	RSR5/PNS5/STYLE5
UI[14]	RSR6/PNS6/STYLE6
UI[15]	RSR7/PNS7/STYLE7
UI[16]	RSR8/PNS8/STYLE8
UI[17]	PNSTROBE
UI[18]	PROD_START



Busy	Step	Hold	Fault	PROG-048 Shift released while running (T
Run	I/O	Prod	TCyc	TEST1215 LINE 1 T2 PAUSED JOINT
I/O UOP In				
	#	STATUS	10/18	
UI[7]		OFF	[Home	
UI[8]		ON	[Enable	
UI[9]		OFF	[RSR1/PNS1/STYLE1]	
UI[10]		ON	[RSR2/PNS2/STYLE2]	
UI[11]		OFF	[RSR3/PNS3/STYLE3]	
UI[12]		OFF	[RSR4/PNS4/STYLE4]	
UI[13]		OFF	[RSR5/PNS5/STYLE5]	
UI[14]		OFF	[RSR6/PNS6/STYLE6]	
UI[15]		OFF	[RSR7/PNS7/STYLE7]	
UI[16]		OFF	[RSR8/PNS8/STYLE8]	
UI[17]		OFF	[PNS strobe	

Comment: RSR2/PNS2/STYLE2



Select	All	1004752 bytes free	25/33
No.	Program name	Comment	
21	M72L_HEM	PC [Set Special Hem]	
22	MTPARAM	VR [
23	PNS0001	[
24	BEOMENU	MR [Request PC Menu]	
25	RSR0151	[
26	SENDDATA	MR [Send PC Data]	
27	SENDEVNT	MR [Send PC Event]	
28	SENDSYSV	MR [Send PC SysVar]	
29	SWIUPDT	VR [
30	TEST1215	[

1. PLC에서 RSR2 신호 입력

2. 로봇, RSR2 신호 ON

3. RSR 프로그램 번호 = Base 번호 + RSR 번호

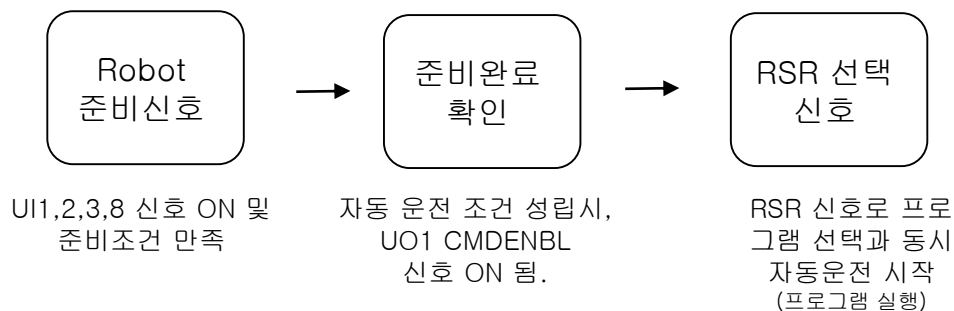
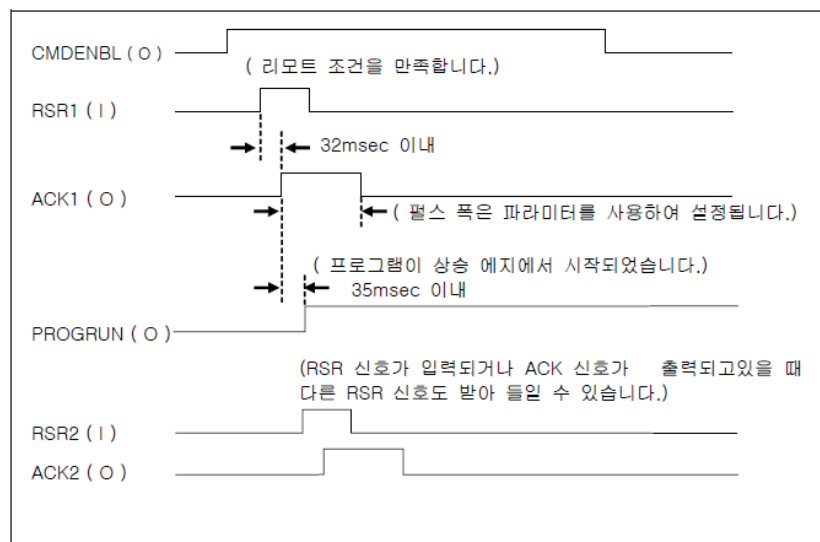
$$\boxed{\text{RSR 0151}} \equiv \boxed{100} + \boxed{51}$$

RSR0151 프로그램이 선택되어 실행됨.

5. IO 신호, RSR 자동 운전 신호 만들기

RSR, Flow chart

UI[1]	IMSTP	상시 ON *4
UI[2]	HOLD	사용 가능
UI[3]	SFSPD	상시 ON *4
UI[4]	CSIOPI	RESET 과 같은 신호에 할당 *1
UI[5]	RESET	사용 가능
UI[6]	START	사용 가능
UI[7]	HOME	할당 없음
UI[8]	ENBL	사용 가능
UI[9]	RSR1/PNS1/STYLE1	PNS1 로 사용 가능 *3
UI[10]	RSR2/PNS2/STYLE2	PNS2 로 사용 가능 *3
UI[11]	RSR3/PNS3/STYLE3	PNS3 으로 사용 가능 *3
UI[12]	RSR4/PNS4/STYLE4	PNS4 로 사용 가능 *3
UI[13]	RSR5/PNS5/STYLE5	할당 없음
UI[14]	RSR6/PNS6/STYLE6	할당 없음
UI[15]	RSR7/PNS7/STYLE7	할당 없음
UI[16]	RSR8/PNS8/STYLE8	할당 없음
UI[17]	PNSTROBE	START 와 같은 신호에 할당 *2
UI[18]	PROD START	할당 없음 *5



6. 참고 자료

Simple assignment

The peripheral I/O signals that the number of signals is small can be used.

Eight input physical signals and four output physical signals are assigned to peripheral I/O signals.

In simple assignment, the number of signals that can be used for general digital I/O is increased because the number of peripheral I/O signals is decreased, but the functions of peripheral I/O signals are restricted as shown in the table below.

UI[1]	IMSTP	Always ON *4
UI[2]	HOLD	Operable
UI[3]	SFSPD	Always ON *4
UI[4]	CSTOPI	Allocated to the same signal as in RESET *1
UI[5]	RESET	Operable
UI[6]	START	Operable
UI[7]	HOME	No allocation
UI[8]	ENBL	Operable
UI[9]	RSR1/PNS1/STYLE1	Operable as PNS1 *3
UI[10]	RSR2/PNS2/STYLE2	Operable as PNS2 *3
UI[11]	RSR3/PNS3/STYLE3	Operable as PNS3 *3
UI[12]	RSR4/PNS4/STYLE4	Operable as PNS4 *3
UI[13]	RSR5/PNS5/STYLE5	No allocation
UI[14]	RSR6/PNS6/STYLE6	No allocation
UI[15]	RSR7/PNS7/STYLE7	No allocation
UI[16]	RSR8/PNS8/STYLE8	No allocation
UI[17]	PNSTROBE	Allocated to the same signal as in START *2
UI[18]	PROD_START	No allocation

UO[1]	CMDENBL	Operable
UO[2]	SYSRDY	No allocation
UO[3]	PROGRUN	No allocation
UO[4]	PAUSED	No allocation
UO[5]	HELD	No allocation
UO[6]	FAULT	Operable
UO[7]	ATPERCH	No allocation
UO[8]	TPENBL	No allocation
UO[9]	BATALM	Operable
UO[10]	BUSY	Operable
UO[11]	ACK1/SNO1	No allocation
UO[12]	ACK2/SNO2	No allocation
UO[13]	ACK3/SNO3	No allocation
UO[14]	ACK4/SNO4	No allocation
UO[15]	ACK5/SNO5	No allocation
UO[16]	ACK6/SNO6	No allocation
UO[17]	ACK7/SNO7	No allocation
UO[18]	ACK8/SNO8	No allocation
UO[19]	SNACK	No allocation
UO[20]	RESERVE	No allocation

- *1 Since CSTOPI and RESET are allocated to the same signal, reset input can forcibly terminate the program if "CSTOPI for ABORT" is enabled.
- *2 Since PNSTROBE and START are allocated to the same signal, the program is selected at the rising edge (OFF→ON) of the START signal and the program is started at the falling edge (ON→OFF) of the START signal.
- *3 Only PNS can be used as the program selection method in simple allocation (that START and PNSTROBE are allocated to the same signal). Even if the "program selection method" other than PNS is selected on the Prog Select screen, PNS is automatically selected during power-on.
- *4 These signals are assigned to the internal I/O device (rack 35, slot 1) in which the signal is always on.
- *5 Since PROD_START is not allocated in simple allocation, when "START for CONTINUE only" item in System Config menu is TRUE, the program cannot be started by peripheral I/O. Set the "START for CONTINUE only" item FALSE in simple allocation.

6. 참고 자료

CSTOPI input UI [4] (Always enabled.)

The cycle stop signal terminates the program currently being executed. It also releases programs from the wait state by RSR.

- When FALSE is selected for "CSTOPI for ABORT" on the Config system setting screen, this signal terminates the program currently being executed as soon as execution of the program completes. It also releases (Clear) programs from the wait state by RSR. (Default)
- When TRUE is selected for "CSTOPI for ABORT" on the Config system setting screen, this signal immediately terminates the program currently being executed. It also releases (Clear) programs from the wait state by RSR.



WARNING

When FALSE is selected for "CSTOPI for ABORT" on the Config system setting screen, CSTOPI does not stop the program being executed until the execution is complete.

6. 참고 자료

START input UI [6] (Enabled in the remote state.)

This is an external start signal. This signal functions at its falling edge when turned off after being turned on. When this signal is received, the following processing is performed:

- When FALSE is selected for "START for CONTINUE" only on the Config system setting screen, the program selected using the teach pendant is executed from the line to which the cursor is positioned. A temporarily stopped program is also continued. (Default)
- When TRUE is selected for "START for CONTINUE" only on the Config system setting screen, a temporarily stopped program is continued. When the program is not temporarily stopped, it cannot be started.

NOTE

To start a program from a peripheral device, the RSR or PROD_START input is used. To start a temporarily stopped program, the START input is used.