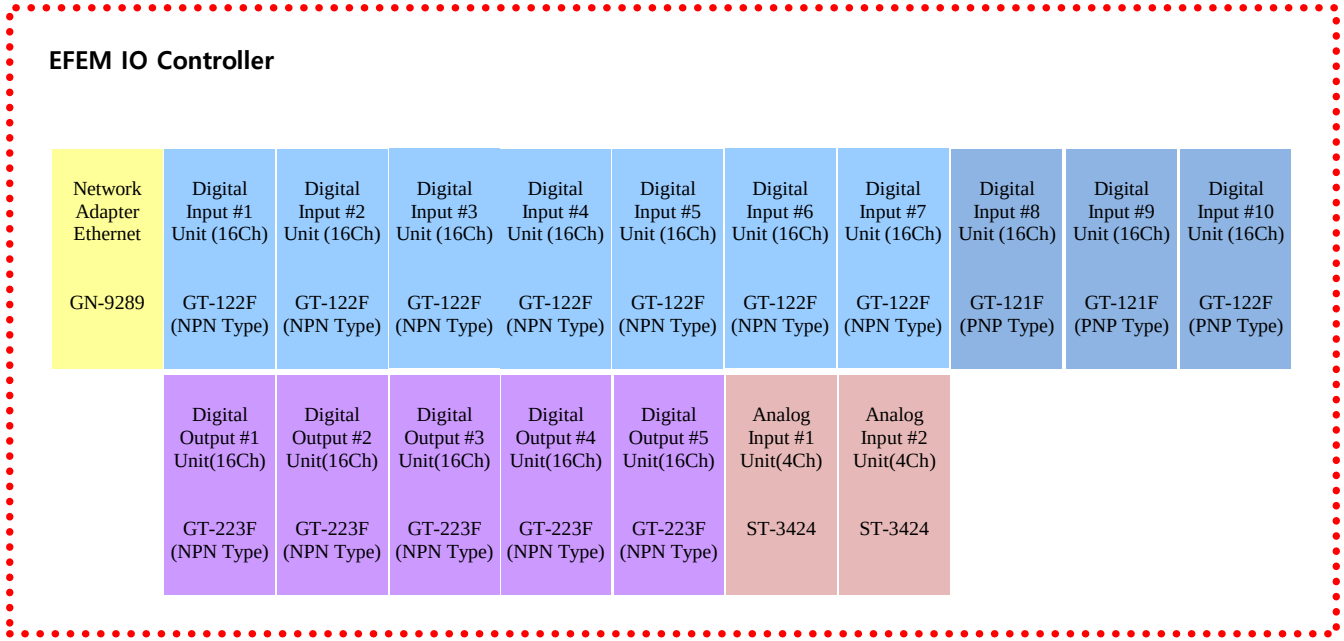
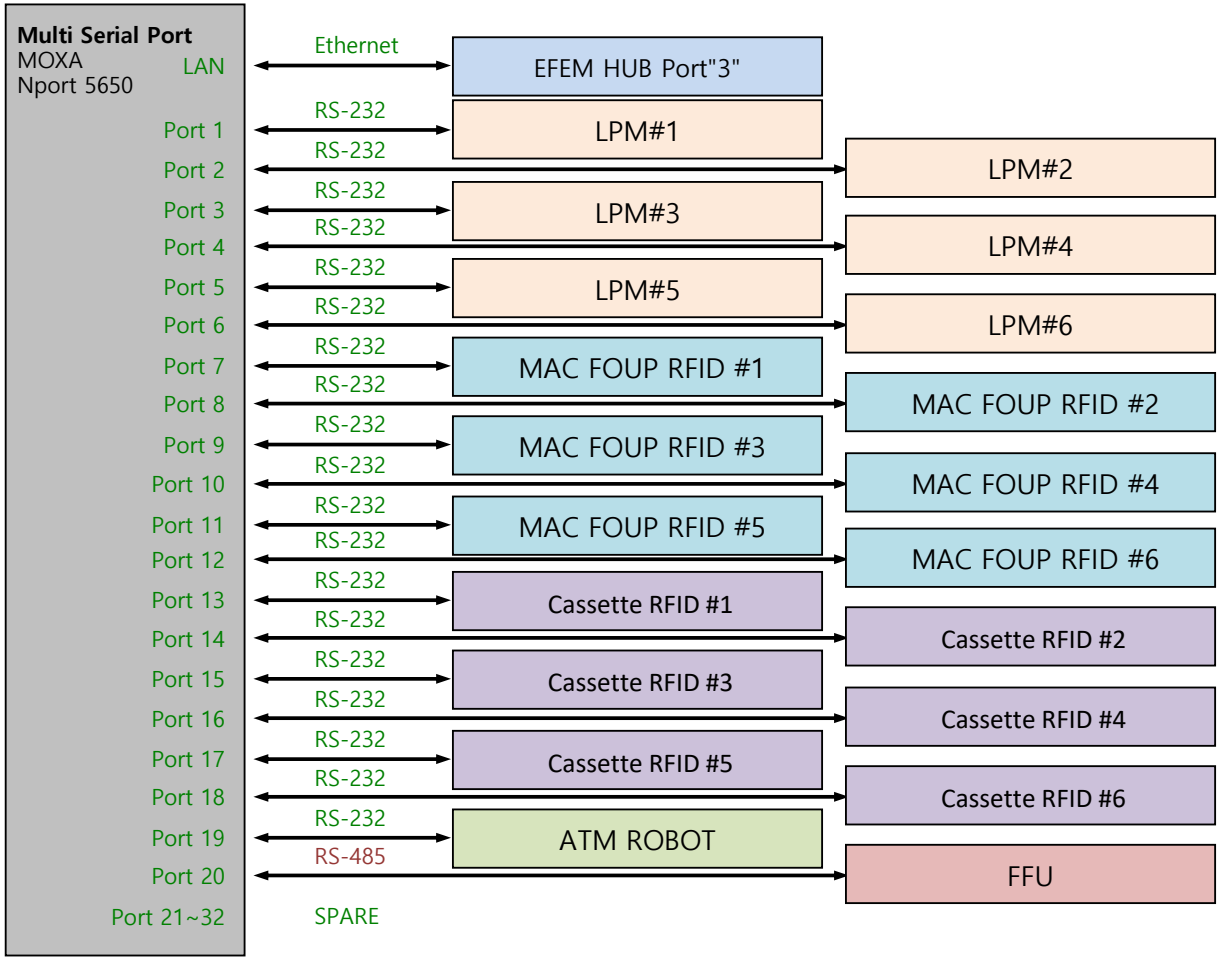
프로텍 6P EFEM I/O Version History

No	Version	Color	Description	Date	Remark
0	프로텍_6Port_EFEM_IO_Map_R00		Preliminary	2023.11.14	JKSung
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					

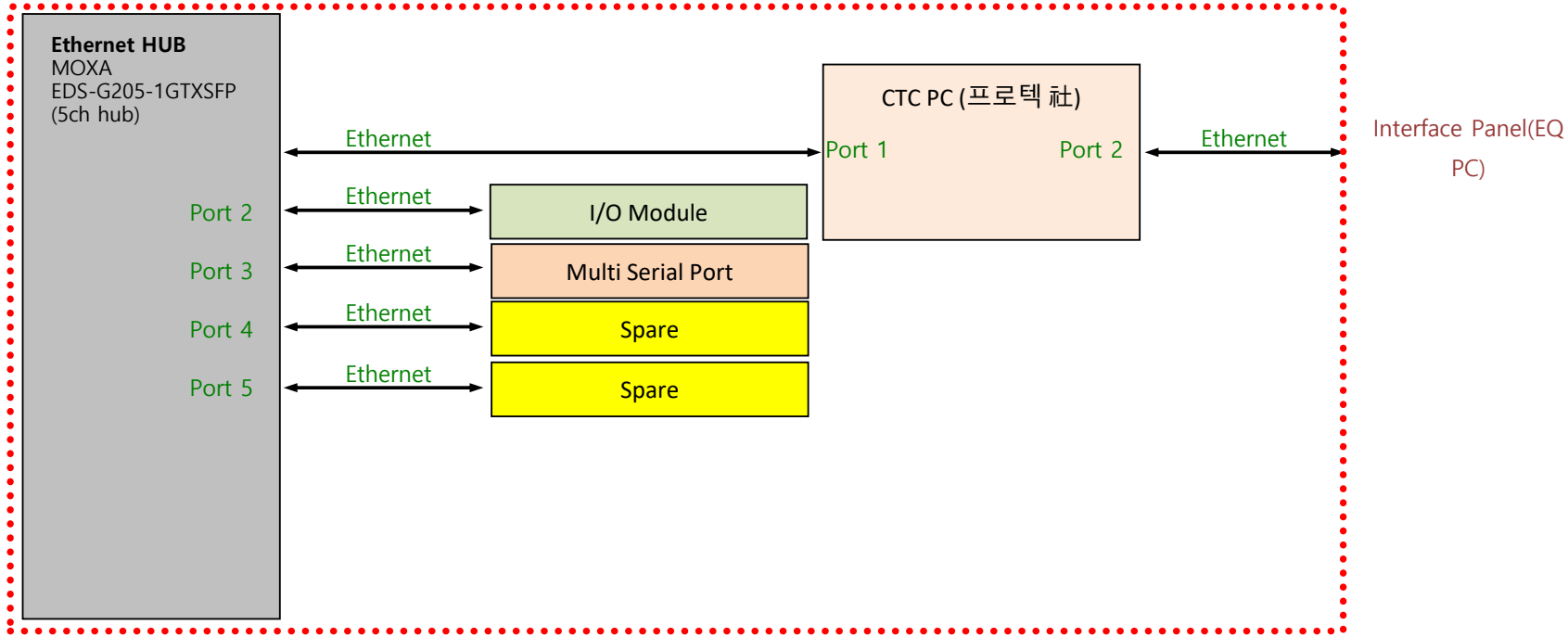
프로텍 6P EFEM IO Controller Configuration



프로텍 6P EFEM Communication Block Diagram



프로텍 Ball Attach 2P EFEM Communication Block Diagram



프로텍 6P EFEM I/O Memory Map

1. Crevis Module

Number	Area		Allocated Bystes	Size	Module	Mod Bus IP	Remark
1	Digital Input	Digital Input	00~19	20 Bytes (160 Points)	GN-9289	192.168.100.100	
	Digital Output	Digital Output	00~09	10 Bytes (80 Points)			
	Analog Input	Analog Input	20~35	16 Bytes (4ch+4ch)			

프로텍 6P EFEM Digital Input

Area	Devicenet No.		Description	Status		I/O No.	Module	Remark
Digital Input	Input Byte 0	Bit 0	OHT1 PIO Valid	0:None	1:Valid	DI00.00	DIM#1 (GT-122F) NPN	
		Bit 1	OHT1 PIO CS_0	0:None	1:CS_0	DI00.01		
		Bit 2	OHT1 PIO CS_1	0:None	1:CS_1	DI00.02		
		Bit 3	OHT1 In4(N/U)	0:None	1:AM_AVBL	DI00.03		
		Bit 4	OHT1 PIO TR_Request	0:None	1:TR_REQ	DI00.04		
		Bit 5	OHT1 PIO Busy	0:None	1:Busy	DI00.05		
		Bit 6	OHT1 PIO Completed	0:None	1:COMPT	DI00.06		
		Bit 7	OHT1 PIO Continue	0:None	1:CONT	DI00.07		
	Input Byte1	Bit 0	OHT2 PIO Valid	0:None	1:Valid	DI01.00		
		Bit 1	OHT2 PIO CS_0	0:None	1:CS_0	DI01.01		
		Bit 2	OHT2 PIO CS_1	0:None	1:CS_1	DI01.02		
		Bit 3	OHT2 In4(N/U)	0:None	1:AM_AVBL	DI01.03		
		Bit 4	OHT2 PIO TR_Request	0:None	1:TR_REQ	DI01.04		
		Bit 5	OHT2 PIO Busy	0:None	1:Busy	DI01.05		
		Bit 6	OHT2 PIO Completed	0:None	1:COMPT	DI01.06		
		Bit 7	OHT2 PIO Continue	0:None	1:CONT	DI01.07		
	Input Byte 2	Bit 0	OHT3 PIO Valid	0:None	1:Valid	DI02.00	DIM#2 (GT-122F) NPN	
		Bit 1	OHT3 PIO CS_0	0:None	1:CS_0	DI02.01		
		Bit 2	OHT3 PIO CS_1	0:None	1:CS_1	DI02.02		
		Bit 3	OHT3 In4(N/U)	0:None	1:AM_AVBL	DI02.03		
		Bit 4	OHT3 PIO TR_Request	0:None	1:TR_REQ	DI02.04		
		Bit 5	OHT3 PIO Busy	0:None	1:Busy	DI02.05		
		Bit 6	OHT3 PIO Completed	0:None	1:COMPT	DI02.06		
		Bit 7	OHT3 PIO Continue	0:None	1:CONT	DI02.07		
	Input Byte 3	Bit 0	OHT4 PIO Valid	0:None	1:Valid	DI03.00		
		Bit 1	OHT4 PIO CS_0	0:None	1:CS_0	DI03.01		
		Bit 2	OHT4 PIO CS_1	0:None	1:CS_1	DI03.02		
		Bit 3	OHT4 In4(N/U)	0:None	1:AM_AVBL	DI03.03		
		Bit 4	OHT4 PIO TR_Request	0:None	1:TR_REQ	DI03.04		
		Bit 5	OHT4 PIO Busy	0:None	1:Busy	DI03.05		
		Bit 6	OHT4 PIO Completed	0:None	1:COMPT	DI03.06		
		Bit 7	OHT4 PIO Continue	0:None	1:CONT	DI03.07		

프로텍 6P EFEM Digital Input

Area	Devicenet No.		Description	Status		I/O No.	Module	Remark
Digital Input	Input Byte 4	Bit 0	OHT5 PIO Valid	0:None	1:Valid	DI04.00	DIM#3 (GT-122F) NPN	
		Bit 1	OHT5 PIO CS_0	0:None	1:CS_0	DI04.01		
		Bit 2	OHT5 PIO CS_1	0:None	1:CS_1	DI04.02		
		Bit 3	OHT5 In4(N/U)	0:None	1:AM_AVBL	DI04.03		
		Bit 4	OHT5 PIO TR_Request	0:None	1:TR_REQ	DI04.04		
		Bit 5	OHT5 PIO Busy	0:None	1:Busy	DI04.05		
		Bit 6	OHT5 PIO Completed	0:None	1:COMPT	DI04.06		
		Bit 7	OHT5 PIO Continue	0:None	1:CONT	DI04.07		
	Input Byte 5	Bit 0	OHT6 PIO Valid	0:None	1:Valid	DI05.00		
		Bit 1	OHT6 PIO CS_0	0:None	1:CS_0	DI05.01		
		Bit 2	OHT6 PIO CS_1	0:None	1:CS_1	DI05.02		
		Bit 3	OHT6 In4(N/U)	0:None	1:AM_AVBL	DI05.03		
		Bit 4	OHT6 PIO TR_Request	0:None	1:TR_REQ	DI05.04		
		Bit 5	OHT6 PIO Busy	0:None	1:Busy	DI05.05		
		Bit 6	OHT6 PIO Completed	0:None	1:COMPT	DI05.06		
		Bit 7	OHT6 PIO Continue	0:None	1:CONT	DI05.07		
	Input Byte 6	Bit 0	LPM 1 Run	0:Ready	1:Busy	DI06.00	DIM#4 (GT-122F) NPN	
		Bit 1	LPM 1 Open	0:Closed	1:Opened	DI06.01		
		Bit 2	LPM 1 Placement(Cassette) Status	0:Off	1:On	DI06.02		
		Bit 3	LPM 1 Placement(MAC FOUP) Status	0:Off	1:On	DI06.03		
		Bit 4	LPM 1 Present Status	0:Off	1:On	DI06.04		
		Bit 5	LPM 1 Manual Button(Cassette) Status	0:Off	1:On	DI06.05		
		Bit 6	LPM 1 Manual Button(MAC FOUP) Status	0:Off	1:On	DI06.06		
		Bit 7	LPM 1 Status Spare			DI06.07		
	Input Byte 7	Bit 0	LPM 2 Run	0:Ready	1:Busy	DI07.00		
		Bit 1	LPM 2 Open	0:Closed	1:Opened	DI07.01		
		Bit 2	LPM 2 Placement(Cassette) Status	0:Off	1:On	DI07.02		
		Bit 3	LPM 2 Placement(MAC FOUP) Status	0:Off	1:On	DI07.03		
		Bit 4	LPM 2 Present Status	0:Off	1:On	DI07.04		
		Bit 5	LPM 2 Manual Button - Cassette	0:Off	1:On	DI07.05		
		Bit 6	LPM 2 Manual Button - MAC FOUP	0:Off	1:On	DI07.06		
		Bit 7	LPM 2 Status Spare			DI07.07		

프로텍 6P EFEM Digital Input

Area	Devicenet No.		Description	Status		I/O No.	Module	Remark
Digital Input	Input Byte 8	Bit 0	LPM 3 Run	0:Ready	1:Busy	DI08.00	DIM#5 (GT-122F) NPN	
		Bit 1	LPM 3 Open	0:Closed	1:Opened	DI08.01		
		Bit 2	LPM 3 Placement(Cassette) Status	0:Off	1:On	DI08.02		
		Bit 3	LPM 3 Placement(MAC FOUP) Status	0:Off	1:On	DI08.03		
		Bit 4	LPM 3 Present Status	0:Off	1:On	DI08.04		
		Bit 5	LPM 3 Manual Button - Cassette	0:Off	1:On	DI08.05		
		Bit 6	LPM 3 Manual Button - MAC FOUP	0:Off	1:On	DI08.06		
		Bit 7	LPM 3 Status Spare			DI08.07		
	Input Byte 9	Bit 0	LPM 4 Run	0:Ready	1:Busy	DI09.00		
		Bit 1	LPM 4 Open	0:Closed	1:Opened	DI09.01		
		Bit 2	LPM 4 Placement(Cassette) Status	0:Off	1:On	DI09.02		
		Bit 3	LPM 4 Placement(MAC FOUP) Status	0:Off	1:On	DI09.03		
		Bit 4	LPM 4 Present Status	0:Off	1:On	DI09.04		
		Bit 5	LPM 4 Manual Button - Cassette	0:Off	1:On	DI09.05		
		Bit 6	LPM 4 Manual Button - MAC FOUP	0:Off	1:On	DI09.06		
		Bit 7	LPM 4 Status Spare			DI09.07		
	Input Byte 10	Bit 0	LPM 5 Run	0:Ready	1:Busy	DI10.00	DIM#6 (GT-122F) NPN	
		Bit 1	LPM 5 Open	0:Closed	1:Opened	DI10.01		
		Bit 2	LPM 5 Placement(Cassette) Status	0:Off	1:On	DI10.02		
		Bit 3	LPM 5 Placement(MAC FOUP) Status	0:Off	1:On	DI10.03		
		Bit 4	LPM 5 Present Status	0:Off	1:On	DI10.04		
		Bit 5	LPM 5 Manual Button - Cassette	0:Off	1:On	DI10.05		
		Bit 6	LPM 5 Manual Button - MAC FOUP	0:Off	1:On	DI10.06		
		Bit 7	LPM 5 Status Spare			DI10.07		
	Input Byte 11	Bit 0	LPM 6 Run	0:Ready	1:Busy	DI11.00		
		Bit 1	LPM 6 Open	0:Closed	1:Opened	DI11.01		
		Bit 2	LPM 6 Placement(Cassette) Status	0:Off	1:On	DI11.02		
		Bit 3	LPM 6 Placement(MAC FOUP) Status	0:Off	1:On	DI11.03		
		Bit 4	LPM 6 Present Status	0:Off	1:On	DI11.04		
		Bit 5	LPM 6 Manual Button - Cassette	0:Off	1:On	DI11.05		
		Bit 6	LPM 6 Manual Button - MAC FOUP	0:Off	1:On	DI11.06		
		Bit 7	LPM 6 Status Spare			DI11.07		

프로텍 6P EFEM Digital Input

Area	Devicenet No.		Description	Status		I/O No.	Module	Remark
Digital Input	Input Byte 12	Bit 0	EFEM Power Box FAN Status	0:Alarm	1:Normal	DI12.00	DIM#7 (GT-122F) NPN	
		Bit 1	EFEM IO Box FAN Status	0:Alarm	1:Normal	DI12.01		
		Bit 2	FFU Alarm	0:Alarm	1:Normal	DI12.02		
		Bit 3	Ionizer#1(LPM1,2,3) Alarm Status	0:Alarm	1:Normal	DI12.03		
		Bit 4	Ionizer#2(LPM4,5,6) Alarm Status	0:Alarm	1:Normal	DI12.04		
		Bit 5	Ionizer#3(EQ1,2) Alarm Status	0:Alarm	1:Normal	DI12.05		
		Bit 6	Ionizer#4(EQ3,4) Alarm Status	0:Alarm	1:Normal	DI12.06		
		Bit 7	EFEM Main CDA Pressure Switch	0:Alarm	1:Normal	DI12.07		압력 설정값 이하면 "0:Alarm"
	Input Byte 13	Bit 0	EFEM Main Vaccum Pressure Switch	0:Alarm	1:Normal	DI13.00		압력 설정값 이하면 "0:Alarm"
		Bit 1	Robot CDA Pressure Switch	0:Alarm	1:Normal	DI13.01		압력 설정값 이하면 "0:Alarm"
		Bit 2	Ionizer CDA Pressure Switch	0:Alarm	1:Normal	DI13.02		압력 설정값 이하면 "0:Alarm"
		Bit 3	Ionizer#1(LPM1,2,3) Flow Meter	0:Alarm	1:Normal	DI13.03		유량 설정값 이하면 "0:Alarm"
		Bit 4	Ionizer#2(LPM4,5,6) Flow Meter	0:Alarm	1:Normal	DI13.04		유량 설정값 이하면 "0:Alarm"
		Bit 5	Ionizer#3(EQ1,2) Flow Meter	0:Alarm	1:Normal	DI13.05		유량 설정값 이하면 "0:Alarm"
		Bit 6	Ionizer#4(EQ3,4) Flow Meter	0:Alarm	1:Normal	DI13.06		유량 설정값 이하면 "0:Alarm"
		Bit 7	Spare			DI13.07		
	Input Byte 14	Bit 0	Robot Retract-Station1(LPM#1-MAC Foup)	0:Extended	1:Retracted	DI14.00	DIM#8 (GT-121F) PNP	
		Bit 1	Robot Retract-Station2(LPM#2-MAC Foup)	0:Extended	1:Retracted	DI14.01		
		Bit 2	Robot Retract-Station3(LPM#3-MAC Foup)	0:Extended	1:Retracted	DI14.02		
		Bit 3	Robot Retract-Station4(LPM#4-MAC Foup)	0:Extended	1:Retracted	DI14.03		
		Bit 4	Robot Retract-Station5(LPM#5-MAC Foup)	0:Extended	1:Retracted	DI14.04		
		Bit 5	Robot Retract-Station6(LPM#6-MAC Foup)	0:Extended	1:Retracted	DI14.05		
		Bit 6	Robot Retract-Station7(LPM#1-Cassette)	0:Extended	1:Retracted	DI14.06		
		Bit 7	Robot Retract-Station8(LPM#2-Cassette)	0:Extended	1:Retracted	DI14.07		
	Input Byte 15	Bit 0	Robot Retract-Station9(LPM#3-Cassette)	0:Extended	1:Retracted	DI15.00		
		Bit 1	Robot Retract-Station10(LPM#4-Cassette)	0:Extended	1:Retracted	DI15.01		
		Bit 2	Robot Retract-Station11(LPM#5-Cassette)	0:Extended	1:Retracted	DI15.02		
		Bit 3	Robot Retract-Station12(LPM#6-Cassette)	0:Extended	1:Retracted	DI15.03		
		Bit 4	Robot Retract-Station13(EQ1)	0:Extended	1:Retracted	DI15.04		EFEM->PM(EQ1) Handshake, Output DO08.07 추가 접점
		Bit 5	Robot Retract-Station14(EQ2)	0:Extended	1:Retracted	DI15.05		EFEM->PM(EQ2) Handshake, Output DO09.00 추가 접점
		Bit 6	Robot Retract-Station15(EQ3)	0:Extended	1:Retracted	DI15.06		EFEM->PM(EQ3) Handshake, Output DO09.01 추가 접점
		Bit 7	Robot Retract-Station16(EQ4)	0:Extended	1:Retracted	DI15.07		EFEM->PM(EQ4) Handshake, Output DO09.02 추가 접점

프로텍 6P EFEM Digital Input

Area	Devicenet No.		Description	Status		I/O No.	Module	Remark
Digital Input	Input Byte 16	Bit 0	Robot Lower Arm Retract	0:Unkown	1:Retracted	DI16.00	DIM#9 (GT-121F) PNP	
		Bit 1	Robot Upper Arm Retract	0:Unkown	1:Retracted	DI16.01		
		Bit 2	Robot Mode	0:Manual	1:Remote	DI16.02		
		Bit 3	Robot Initialize Complete	0:Unkown	1:Initialized	DI16.03		
		Bit 4	Robot Busy Status	0:Busy	1:Ready	DI16.04		
		Bit 5	Robot Alarm Status	0:Alarm	1:Normal	DI16.05		
		Bit 6	Robot Wafer On Arm Lower	0:Unkown	1:Presence	DI16.06		
		Bit 7	Robot Wafer On Arm Upper	0:Unkown	1:Presence	DI16.07		
	Input Byte 17	Bit 0	Robot Controller Fan Alarm	0:Alarm	1:Normal	DI17.00		
		Bit 1	Robot Servo On/OFF Status	0:Off	1:On	DI17.01		
		Bit 2	EFEM EMS Status	0:EMS	1:Normal	DI17.02		
		Bit 3	Protection Bar LPM1,2,3	0:Alarm	1:Normal	DI17.03		
		Bit 4	Protection Bar LPM4,5,6	0:Alarm	1:Normal	DI17.04		
		Bit 5	EFEM Door Close	0:Opend	1:Closed	DI17.05		Opend 시 자동운전 금지.
		Bit 6	Auto/Manual Mode	0:Manual	1:Auto	DI17.06		Manual Mode 시 자동운전 금지.
		Bit 7	Fire Detector	0:Alarm	1:Normal	DI17.07		
	Input Byte 18	Bit 0	EQ1 Ready	0:Unkown	1:Ready	DI18.00	DIM#10 (GT-121F) PNP	"1:Ready"일때 EQ1으로 Extend 가능.
		Bit 1	EQ2 Ready	0:Unkown	1:Ready	DI18.01		"1:Ready"일때 EQ2으로 Extend 가능.
		Bit 2	EQ3 Ready	0:Unkown	1:Ready	DI18.02		"1:Ready"일때 EQ3으로 Extend 가능.
		Bit 3	EQ4 Ready	0:Unkown	1:Ready	DI18.03		"1:Ready"일때 EQ4으로 Extend 가능.
		Bit 4	EQ1 Handshake	0:Unkown	1:Ready	DI18.04		
		Bit 5	EQ2 Handshake	0:Unkown	1:Ready	DI18.05		
		Bit 6	EQ3 Handshake	0:Unkown	1:Ready	DI18.06		
		Bit 7	EQ4 Handshake	0:Unkown	1:Ready	DI18.07		
	Input Byte 19	Bit 0	Spare			DI19.00		
		Bit 1	Spare			DI19.01		
		Bit 2	Spare			DI19.02		
		Bit 3	Spare			DI19.03		
		Bit 4	Spare			DI19.04		
		Bit 5	Spare			DI19.05		
		Bit 6	Spare			DI19.06		
		Bit 7	Spare			DI19.07		

프로텍 6P EFEM Analog Input

Area	Modbus No.		Description	Status		Data(Hex)	Module	Remark
Analog Input Module #1	Input Byte 20~21	Ch1	EFEM Main CDA Pressure Switch	1~5V	−0 ~ 1.000MPa	H 0000~ H 0FFF	AIM#1 (ST-3624)	
	Input Byte 22~23	Ch2	EFEM Main Vacuum Pressure Switch	1~5V	0.0 ~ −101.0kPa	H 0000~ H 0FFF		
	Input Byte 24~25	Ch3	Robot CDA Pressure Switch	1~5V	−0 ~ 1.000MPa	H 0000~ H 0FFF		
	Input Byte 26~27	Ch4	Ionizer Pressure Switch	1~5V	−0 ~ 1.000MPa	H 0000~ H 0FFF		
Analog Input Module #2	Input Byte 28~29	Ch1	Ionizer#1(LPM1,2,3) Flow Meter	1~5V	−1 ~ 50(L/min)	H 0000~ H 0FFF	AIM#2 (ST-3624)	
	Input Byte 30~31	Ch2	Ionizer#2(LPM4,5,6) Flow Meter	1~5V	−1 ~ 50(L/min)	H 0000~ H 0FFF		
	Input Byte 32~33	Ch3	Ionizer#3(EQ1,2)Flow Meter	1~5V	−1 ~ 50(L/min)	H 0000~ H 0FFF		
	Input Byte 34~35	Ch4	Ionizer#4(EQ3,4) Flow Meter	1~5V	−1 ~ 50(L/min)	H 0000~ H 0FFF		

프로텍 6P EFEM Output

Area	Devicenet No.		Description	Status		I/O No.	Module	Remark
Digital Output	Output Byte 0	Bit 0	OHT1 PIO L_Req	0:False	1:True	DO00.00	DOM#1 (ST-221F) NPN	
		Bit 1	OHT1 PIO U_Req	0:False	1:True	DO00.01		
		Bit 2	OHT1 Out3(N/U)	0:False	1:True	DO00.02		
		Bit 3	OHT1 PIO Ready	0:False	1:True	DO00.03		
		Bit 4	OHT1 Out5(N/U)	0:False	1:True	DO00.04		
		Bit 5	OHT1 Out6(N/U)	0:False	1:True	DO00.05		
		Bit 6	OHT1 PIO HO_Avbl	0:False	1:True	DO00.06		
		Bit 7	OHT1 PIO ES	0:False	1:True	DO00.07		
	Output Byte 1	Bit 0	OHT2 PIO L_Req	0:False	1:True	DO01.00		
		Bit 1	OHT2 PIO U_Req	0:False	1:True	DO01.01		
		Bit 2	OHT2 Out3(N/U)	0:False	1:True	DO01.02		
		Bit 3	OHT2 PIO Ready	0:False	1:True	DO01.03		
		Bit 4	OHT2 Out5(N/U)	0:False	1:True	DO01.04		
		Bit 5	OHT2 Out6(N/U)	0:False	1:True	DO01.05		
		Bit 6	OHT2 PIO HO_Avbl	0:False	1:True	DO01.06		
		Bit 7	OHT2 PIO ES	0:False	1:True	DO01.07		
	Output Byte 2	Bit 0	OHT3 PIO L_Req	0:False	1:True	DO02.00	DOM#2 (ST-221F) NPN	
		Bit 1	OHT3 PIO U_Req	0:False	1:True	DO02.01		
		Bit 2	OHT3 Out3(N/U)	0:False	1:True	DO02.02		
		Bit 3	OHT3 PIO Ready	0:False	1:True	DO02.03		
		Bit 4	OHT3 Out5(N/U)	0:False	1:True	DO02.04		
		Bit 5	OHT3 Out6(N/U)	0:False	1:True	DO02.05		
		Bit 6	OHT3 PIO HO_Avbl	0:False	1:True	DO02.06		
		Bit 7	OHT3 PIO ES	0:False	1:True	DO02.07		
	Output Byte 3	Bit 0	OHT4 PIO L_Req	0:False	1:True	DO03.00		
		Bit 1	OHT4 PIO U_Req	0:False	1:True	DO03.01		
		Bit 2	OHT4 Out3(N/U)	0:False	1:True	DO03.02		
		Bit 3	OHT4 PIO Ready	0:False	1:True	DO03.03		
		Bit 4	OHT4 Out5(N/U)	0:False	1:True	DO03.04		
		Bit 5	OHT4 Out6(N/U)	0:False	1:True	DO03.05		
		Bit 6	OHT4 PIO HO_Avbl	0:False	1:True	DO03.06		
		Bit 7	OHT4 PIO ES	0:False	1:True	DO03.07		
	Output Byte 4	Bit 0	OHT5 PIO L_Req	0:False	1:True	DO04.00	DOM#3 (ST-221F) NPN	
		Bit 1	OHT5 PIO U_Req	0:False	1:True	DO04.01		
		Bit 2	OHT5 Out3(N/U)	0:False	1:True	DO04.02		
		Bit 3	OHT5 PIO Ready	0:False	1:True	DO04.03		
		Bit 4	OHT5 Out5(N/U)	0:False	1:True	DO04.04		
		Bit 5	OHT5 Out6(N/U)	0:False	1:True	DO04.05		
		Bit 6	OHT5 PIO HO_Avbl	0:False	1:True	DO04.06		
		Bit 7	OHT5 PIO ES	0:False	1:True	DO04.07		
	Output Byte 5	Bit 0	OHT6 PIO L_Req	0:False	1:True	DO05.00		
		Bit 1	OHT6 PIO U_Req	0:False	1:True	DO05.01		
		Bit 2	OHT6 Out3(N/U)	0:False	1:True	DO05.02		
		Bit 3	OHT6 PIO Ready	0:False	1:True	DO05.03		
		Bit 4	OHT6 Out5(N/U)	0:False	1:True	DO05.04		
		Bit 5	OHT6 Out6(N/U)	0:False	1:True	DO05.05		
		Bit 6	OHT6 PIO HO_Avbl	0:False	1:True	DO05.06		
		Bit 7	OHT6 PIO ES	0:False	1:True	DO05.07		

프로텍 6P EFEM Output

Area	Devicenet No.		Description	Status		I/O No.	Module	Remark
Digital Output	Output Byte 6	Bit 0	LPM #1 - Manual(Cassette)	0:Off	1:On	DO06.00	DOM#4 (ST-221F) NPN	
		Bit 1	LPM #1 - Manual(MAC FOUP)	0:Off	1:On	DO06.01		
		Bit 2	LPM #2 - Manual(Cassette)	0:Off	1:On	DO06.02		
		Bit 3	LPM #2 - Manual(MAC FOUP)	0:Off	1:On	DO06.03		
		Bit 4	LPM #3 - Manual(Cassette)	0:Off	1:On	DO06.04		
		Bit 5	LPM #3 - Manual(MAC FOUP)	0:Off	1:On	DO06.05		
		Bit 6	LPM #4 - Manual(Cassette)	0:Off	1:On	DO06.06		
		Bit 7	LPM #4 - Manual(MAC FOUP)	0:Off	1:On	DO06.07		
	Output Byte 7	Bit 0	LPM #5 - Manual(Cassette)	0:Off	1:On	DO07.00		
		Bit 1	LPM #5 - Manual(MAC FOUP)	0:Off	1:On	DO07.01		
		Bit 2	LPM #6 - Manual(Cassette)	0:Off	1:On	DO07.02		
		Bit 3	LPM #6 - Manual(MAC FOUP)	0:Off	1:On	DO07.03		
		Bit 4	Ionizer#1(LPM1,2,3) On/Off	0:Off	1:On	DO07.04		
		Bit 5	Ionizer#2(LPM4,5,6) On/Off	0:Off	1:On	DO07.05		
		Bit 6	Ionizer#3(EQ1,2) On/Off	0:Off	1:On	DO07.06		
		Bit 7	Ionizer#4(EQ3,4) On/Off	0:Off	1:On	DO07.07		
	Output Byte 8	Bit 0	Signal Tower(Red)	0:Off	1:On	DO08.00	DOM#5 (ST-221F) NPN	
		Bit 1	Signal Tower(Yellow)	0:Off	1:On	DO08.01		
		Bit 2	Signal Tower(Green)	0:On	1:Off	DO08.02		
		Bit 3	Signal Tower(Blue) (N/U)	0:On	1:Off	DO08.03		
		Bit 4	Signal Tower(Buzzer 1)	0:On	1:Off	DO08.04		
		Bit 5	Signal Tower(Buzzer 2) (N/U)	0:On	1:Off	DO08.05		
		Bit 6	EFEM Door Open/Close	0:Close	1:Open	DO08.06		1:On'시 양쪽 Door Open
		Bit 7	ATM Robot Handshake(EQ1)	0:Extended	1:Retracted	DO08.07		
	Output Byte 9	Bit 0	ATM Robot Handshake(EQ2)	0:Extended	1:Retracted	DO09.00		
		Bit 1	ATM Robot Handshake(EQ3)	0:Extended	1:Retracted	DO09.01		
		Bit 2	ATM Robot Handshake(EQ4)	0:Extended	1:Retracted	DO09.02		
		Bit 3	Spare			DO09.03		
		Bit 4	Spare			DO09.04		
		Bit 5	Spare			DO09.05		
		Bit 6	Spare			DO09.06		
		Bit 7	Spare			DO09.07		

프로텍 6P EFEM Safety Interlock

1. ATM Robot Extend

Interlock I/O		Related I/O		Status(1: Apply)		Cause	Interlock	Remark
Description	I/O Bit	Description	I/O Bit					
ATM Robot Extend Enable -LPM1 MAC Foup		LPM 1 Open	DI06.01	0:Closed	1:Opened	LPM1에 MAC FOUP Placement가 On되지 않고 LPM1이 Open되지 않은 상태에서 ATM Robot이 Extend하려고 할 경우	ATM Robot이 Extend되지 않고 Alarm 발생.	
		LPM 1 Placement(Cassette) Status	DI06.03	0:Off	1:On			
ATM Robot Extend Enable -LPM2 MAC Foup		LPM 2 Open	DI07.00	0:Closed	1:Opened	LPM2에 MAC FOUP Placement가 On되지 않고 LPM2이 Open되지 않은 상태에서 ATM Robot이 Extend하려고 할 경우	ATM Robot이 Extend되지 않고 Alarm 발생.	
		LPM 2 Placement(MAC FOUP) Status	DI07.03	0:Off	1:On			
ATM Robot Extend Enable -LPM3 MAC Foup		LPM 3 Open	DI08.01	0:Closed	1:Opened	LPM3에 MAC FOUP Placement가 On되지 않고 LPM3이 Open되지 않은 상태에서 ATM Robot이 Extend하려고 할 경우	ATM Robot이 Extend되지 않고 Alarm 발생.	
		LPM 3 Placement(MAC FOUP) Status	DI08.03	0:Off	1:On			
ATM Robot Extend Enable -LPM4 MAC Foup		LPM 4 Open	DI09.01	0:Closed	1:Opened	LPM4에 MAC FOUP Placement가 On되지 않고 LPM4이 Open되지 않은 상태에서 ATM Robot이 Extend하려고 할 경우	ATM Robot이 Extend되지 않고 Alarm 발생.	
		LPM 4 Placement(MAC FOUP) Status	DI09.03	0:Off	1:On			
ATM Robot Extend Enable -LPM5 MAC Foup		LPM 5 Open	DI10.01	0:Closed	1:Opened	LPM5에 MAC FOUP Placement가 On되지 않고 LPM5이 Open되지 않은 상태에서 ATM Robot이 Extend하려고 할 경우	ATM Robot이 Extend되지 않고 Alarm 발생.	
		LPM 5 Placement(MAC FOUP) Status	DI10.03	0:Off	1:On			
ATM Robot Extend Enable -LPM6 MAC Foup		LPM 6 Open	DI11.01	0:Closed	1:Opened	LPM6에 MAC FOUP Placement가 On되지 않고 LPM6이 Open되지 않은 상태에서 ATM Robot이 Extend하려고 할 경우	ATM Robot이 Extend되지 않고 Alarm 발생.	
		LPM 6 Placement(MAC FOUP) Status	DI11.03	0:Off	1:On			
ATM Robot Extend Enable -LPM1 Cassette		LPM 1 Open	DI06.01	0:Closed	1:Opened	LPM1에 Cassette Placement가 On되지 않고 LPM1이 Open되지 않은 상태에서 ATM Robot이 Extend하려고 할 경우	ATM Robot이 Extend되지 않고 Alarm 발생.	
		LPM 1 Placement(Cassette) Status	DI06.02	0:Off	1:On			
ATM Robot Extend Enable -LPM2 Cassette		LPM 2 Open	DI07.00	0:Closed	1:Opened	LPM2에 Cassette Placement가 On되지 않고 LPM2이 Open되지 않은 상태에서 ATM Robot이 Extend하려고 할 경우	ATM Robot이 Extend되지 않고 Alarm 발생.	
		LPM 2 Placement(Cassette) Status	DI07.02	0:Off	1:On			
ATM Robot Extend Enable -LPM3 Cassette		LPM 3 Open	DI08.01	0:Closed	1:Opened	LPM3에 Cassette Placement가 On되지 않고 LPM3이 Open되지 않은 상태에서 ATM Robot이 Extend하려고 할 경우	ATM Robot이 Extend되지 않고 Alarm 발생.	
		LPM 3 Placement(Cassette) Status	DI08.02	0:Off	1:On			
ATM Robot Extend Enable -LPM4 Cassette		LPM 4 Open	DI09.01	0:Closed	1:Opened	LPM4에 Cassette Placement가 On되지 않고 LPM4이 Open되지 않은 상태에서 ATM Robot이 Extend하려고 할 경우	ATM Robot이 Extend되지 않고 Alarm 발생.	
		LPM 4 Placement(Cassette) Status	DI09.02	0:Off	1:On			
ATM Robot Extend Enable -LPM5 Cassette		LPM 5 Open	DI10.01	0:Closed	1:Opened	LPM5에 Cassette Placement가 On되지 않고 LPM5이 Open되지 않은 상태에서 ATM Robot이 Extend하려고 할 경우	ATM Robot이 Extend되지 않고 Alarm 발생.	
		LPM 5 Placement(Cassette) Status	DI10.02	0:Off	1:On			
ATM Robot Extend Enable -LPM6 Cassette		LPM 6 Open	DI11.01	0:Closed	1:Opened	LPM6에 Cassette Placement가 On되지 않고 LPM6이 Open되지 않은 상태에서 ATM Robot이 Extend하려고 할 경우	ATM Robot이 Extend되지 않고 Alarm 발생.	
		LPM 6 Placement(Cassette) Status	DI11.02	0:Off	1:On			
ATM Robot Extend Enable -EQ1		EQ1 Ready	DI18.00	0:Unkown	1:Ready	EQ1 Stage가 Ready 되지 않은 상태에서 ATM Robot이 Extend하려고 할 경우	ATM Robot이 Extend되지 않고 Alarm 발생.	
ATM Robot Extend Enable -EQ2		EQ2 Ready	DI18.01	0:Unkown	1:Ready	EQ2 Stage가 Ready 되지 않은 상태에서 ATM Robot이 Extend하려고 할 경우	ATM Robot이 Extend되지 않고 Alarm 발생.	
ATM Robot Extend Enable -EQ3		EQ3 Ready	DI18.02	0:Unkown	1:Ready	EQ3 Stage가 Ready 되지 않은 상태에서 ATM Robot이 Extend하려고 할 경우	ATM Robot이 Extend되지 않고 Alarm 발생.	
ATM Robot Extend Enable -EQ4		EQ4 Ready	DI18.03	0:Unkown	1:Ready	EQ4 Stage가 Ready 되지 않은 상태에서 ATM Robot이 Extend하려고 할 경우	ATM Robot이 Extend되지 않고 Alarm 발생.	

프로텍 6P EFEM Safety Interlock

2. ATM Robot Interlock

Interlock I/O		Related I/O		Status(1: Apply)		Cause	Interlock	Remark
Description	I/O Bit	Description	I/O Bit					
ATM Robot Interlock	DI17.04	EFEM Door Close		0:Opened	1:Closed	EFEM Door가 Unlock 또는 Open 될 경우	ATM Robot Servo Off	

3. LPM Interlock

Interlock I/O		Related I/O		Status(1: Apply)		Cause	Interlock	Remark
Description	I/O Bit	Description	I/O Bit					
LPM#1 Load & Unload	DI14.00	ATM Robot Retract-Station1(LPM#1-MAC Foup)		0:Extended	1:Retracted	ATM Robot이 LPM#1의 MAC Foup과 Cassette 중 하나라도 Retract 아닌 경우	Load 및 Unload가 되지 않음	
	DI14.06	ATM Robot Retract-Station7(LPM#1-Cassette)		0:Extended	1:Retracted			
	DI17.04	EFEM Door Close		0:Opened	1:Closed	EFEM Door가 Unlock 또는 Open 될 경우		
LPM#2 Load & Unload	DI14.01	ATM Robot Retract-Station2(LPM#2-MAC Foup)		0:Extended	1:Retracted	ATM Robot이 LPM#2의 MAC Foup과 Cassette 중 하나라도 Retract 아닌 경우	Load 및 Unload가 되지 않음	
	DI14.07	ATM Robot Retract-Station8(LPM#2-Cassette)		0:Extended	1:Retracted			
	DI17.04	EFEM Door Close		0:Opened	1:Closed	EFEM Door가 Unlock 또는 Open 될 경우		
LPM#3 Load & Unload	DI14.02	ATM Robot Retract-Station3(LPM#3-MAC Foup)		0:Extended	1:Retracted	ATM Robot이 LPM#3의 MAC Foup과 Cassette 중 하나라도 Retract 아닌 경우	Load 및 Unload가 되지 않음	
	DI15.00	ATM Robot Retract-Station9(LPM#3-Cassette)		0:Extended	1:Retracted			
	DI17.04	EFEM Door Close		0:Opened	1:Closed	EFEM Door가 Unlock 또는 Open 될 경우		
LPM#4 Load & Unload	DI14.03	ATM Robot Retract-Station4(LPM#4-MAC Foup)		0:Extended	1:Retracted	ATM Robot이 LPM#4의 MAC Foup과 Cassette 중 하나라도 Retract 아닌 경우	Load 및 Unload가 되지 않음	
	DI15.01	ATM Robot Retract-Station10(LPM#4-Cassette)		0:Extended	1:Retracted			
	DI17.04	EFEM Door Close		0:Opened	1:Closed	EFEM Door가 Unlock 또는 Open 될 경우		
LPM#5 Load & Unload	DI14.04	ATM Robot Retract-Station5(LPM#5-MAC Foup)		0:Extended	1:Retracted	ATM Robot이 LPM#5의 MAC Foup과 Cassette 중 하나라도 Retract 아닌 경우	Load 및 Unload가 되지 않음	
	DI15.02	ATM Robot Retract-Station11(LPM#5-Cassette)		0:Extended	1:Retracted			
	DI17.04	EFEM Door Close		0:Opened	1:Closed	EFEM Door가 Unlock 또는 Open 될 경우		
LPM#6 Load & Unload	DI14.05	ATM Robot Retract-Station6(LPM#6-MAC Foup)sette)		0:Extended	1:Retracted	ATM Robot이 LPM#6의 MAC Foup과 Cassette 중 하나라도 Retract 아닌 경우	Load 및 Unload가 되지 않음	
	DI15.03	ATM Robot Retract-Station12(LPM#6-Cassette)		0:Extended	1:Retracted			
	DI17.04	EFEM Door Close		0:Opened	1:Closed	EFEM Door가 Unlock 또는 Open 될 경우		

4. Protection Bar

Interlock I/O		Related I/O		Status(1: Apply)		Cause	Interlock	Remark
Description	I/O Bit	Description	I/O Bit					
Protection Bar Interlock	DI17.02	Protection Bar LPM1,2,3		0:Alarm	1:Normal	Light Curtain이 감지되어 Alarm인 상태	OHT1, OHT2, OHT3, OHT4, OHT5, OHT6 PIO ES Signal Off	
	DI17.03	Protection Bar LPM4,5,6		0:Alarm	1:Normal			

프로텍 6P EFEM Communicaton

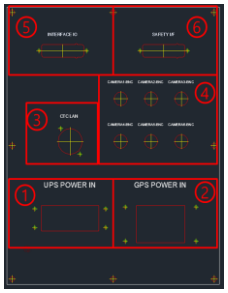
1. Serial Multi Port

Module	Port	Serial	Description	Baud Rate	Maker	COM Port	Remark
Multi Serial Port NPORT 6650-32 Moxa	Port1	RS-232	LPM_#1	9600, None, 8, 2		COM11	
	Port2	RS-232	LPM_#2	9600, None, 8, 2		COM12	
	Port3	RS-232	LPM_#3	9600, None, 8, 2		COM13	
	Port4	RS-232	LPM_#4	9600, None, 8, 2		COM14	
	Port5	RS-232	LPM_#5	9600, None, 8, 2		COM15	
	Port6	RS-232	LPM_#6	9600, None, 8, 2		COM16	
	Port7	RS-232	MAC FOUP RFID #1	19200, Even, 8, 1		COM17	
	Port8	RS-232	MAC FOUP RFID #2	19200, Even, 8, 1		COM18	
	Port9	RS-232	MAC FOUP RFID #3	19200, Even, 8, 1		COM19	
	Port10	RS-232	MAC FOUP RFID #4	19200, Even, 8, 1		COM20	
	Port11	RS-232	MAC FOUP RFID #5	19200, Even, 8, 1		COM21	
	Port12	RS-232	MAC FOUP RFID #6	19200, Even, 8, 1		COM22	
	Port13	RS-232	Cassette RFID #1	9600, None, 8, 1		COM23	
	Port14	RS-232	Cassette RFID #2	9600, None, 8, 1		COM24	
	Port15	RS-232	Cassette RFID #3	9600, None, 8, 1		COM25	
	Port16	RS-232	Cassette RFID #4	9600, None, 8, 1		COM26	
	Port17	RS-232	Cassette RFID #5	9600, None, 8, 1		COM27	
	Port18	RS-232	Cassette RFID #6	9600, None, 8, 1		COM28	
	Port19	RS-232	ATM Robot	19200,None,8,1		COM29	
	Port20	RS-485	FFU	9600, None, 8, 1		COM30	
	Port21~32	RS-232/RS-485	Spare				

2. Ethernet (HUB)

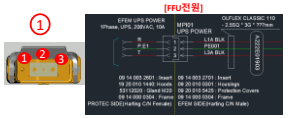
Description	Port	IP Address	Subnet	Gateway	Remark
CTC (프로텍 社)	LAN1	192.168.100.150	확인 필요	N/A	
I/O Module (Crevis GN-9289)	LAN2	192.168.100.100	확인 필요	N/A	
Multi Serial Port	LAN3	192.168.100.110	확인 필요	N/A	
N/A					
N/A					
N/A					

프로텍 6P EFEM to EQ Interface



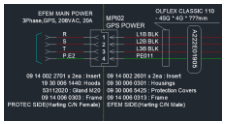
[UPS Power]

[FFU전원]



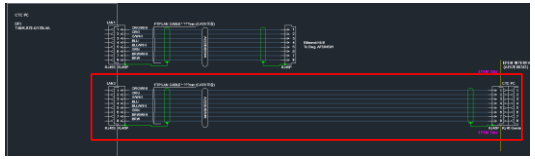
- Cable Side Connector는 싸이맥스에서 제공.
- 설비 반입시 동봉.
- 전원 사양 : 1Phase AC 220V 10A (10A ELCB 적용)

[GPS Power]

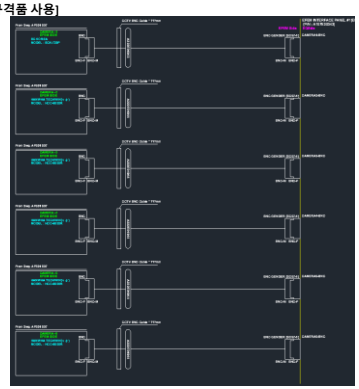


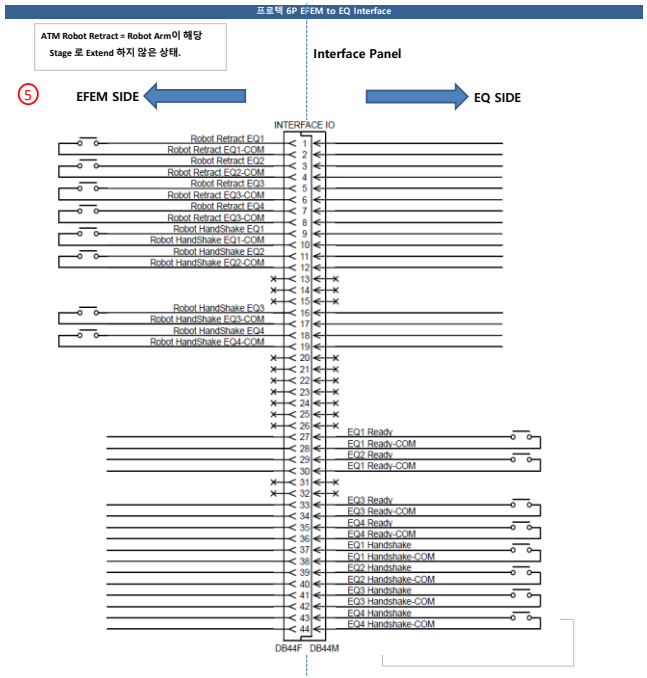
- Cable Side Connector는 싸이맥스에서 제공.
- 설비 반입시 동봉.
- 전원 사양 : 3Phase AC208V 20A (20A ELCB 적용)

③ [CTC LAN]

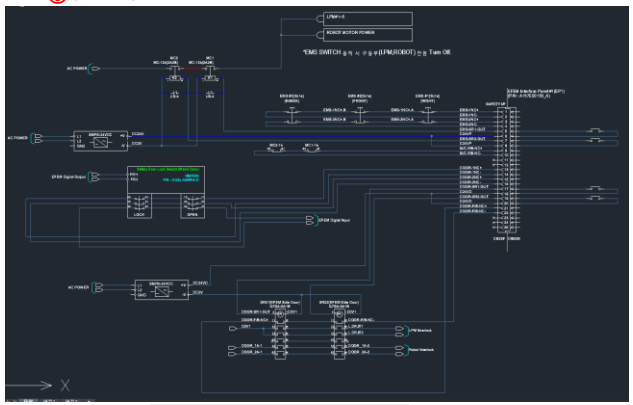


④ [CAMERA BNC]
[*규격품 사용]



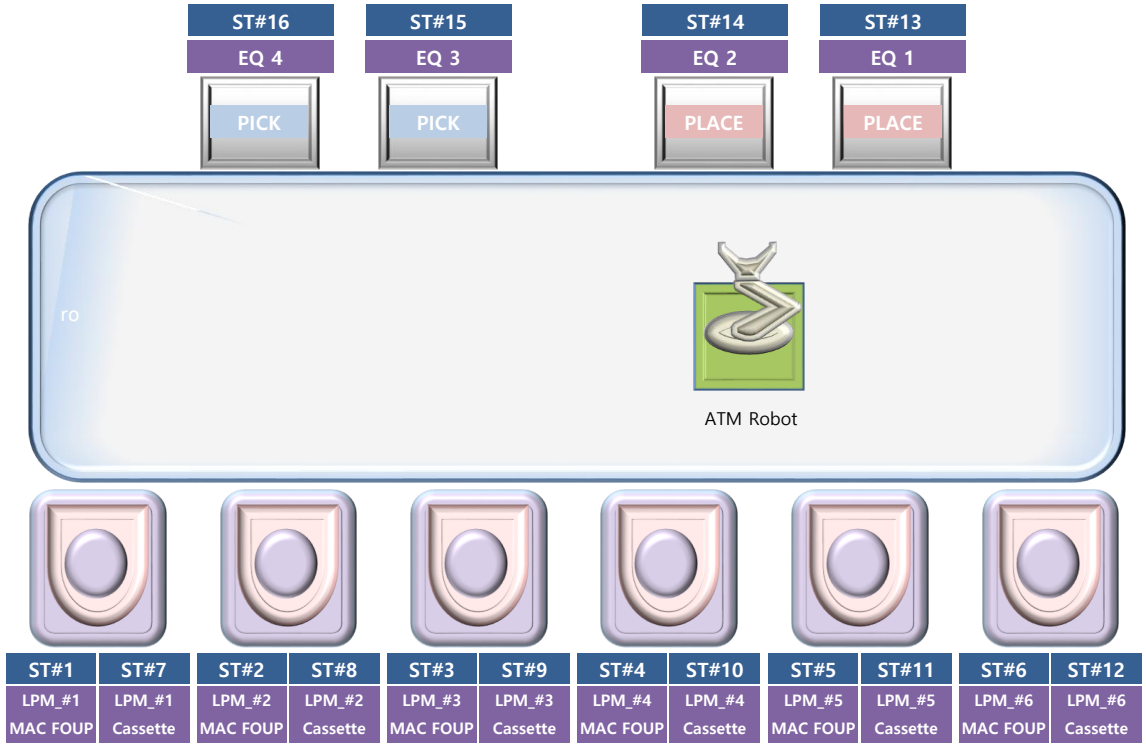

프로텍 6P EFEM to EQ Interface
ATM Robot Retract = Robot Arm이 해당
Stage 로 Extend 하지 않은 상태.
Interface Panel
5
EFEM SIDE
EQ SIDE
INTERFACE IO
Robot Retract EQ1
Robot Retract EQ1-COM
Robot Retract EQ2
Robot Retract EQ2-COM
Robot Retract EQ3
Robot Retract EQ3-COM
Robot Retract EQ4
Robot Retract EQ3-COM
Robot HandShake EQ1
Robot HandShake EQ1-COM
Robot HandShake EQ2
Robot HandShake EQ2-COM
Robot HandShake EQ3
Robot HandShake EQ3-COM
Robot HandShake EQ4
Robot HandShake EQ4-COM
EQ1 Ready
EQ1 Ready-COM
EQ2 Ready
EQ1 Ready-COM
EQ3 Ready
EQ3 Ready-COM
EQ4 Ready
EQ4 Ready-COM
EQ1 Handshake
EQ1 Handshake-COM
EQ2 Handshake
EQ2 Handshake-COM
EQ3 Handshake
EQ3 Handshake-COM
EQ4 Handshake
EQ4 Handshake-COM
DB44F
DB44M

⑥ [SAFETY I/F]



EMS Reset & Door Reset은 프로텍 Safety PLC 에서 제어

프로텍 6P EFEM Robot Station



Station Definition

Station	EFEM
ST#1	LPM#1(MAC FOUP)
ST#2	LPM#2(MAC FOUP)
ST#3	LPM#3(MAC FOUP)
ST#4	LPM#4(MAC FOUP)
ST#5	LPM#5(MAC FOUP)
ST#6	LPM#6(MAC FOUP)
ST#7	LPM#1(Cassette)
ST#8	LPM#2(Cassette)
ST#9	LPM#3(Cassette)
ST#10	LPM#4(Cassette)
ST#11	LPM#5(Cassette)
ST#12	LPM#6(Cassette)
ST#13	EQ 1
ST#14	EQ 2
ST#15	EQ 3
ST#16	EQ 4