O A C I S

Open **A**rchitecture **C**ontrol **I**ntegrated **S**ystem

How to Set CC-LINK with OACIS-1XC_2XC

Version 01.03

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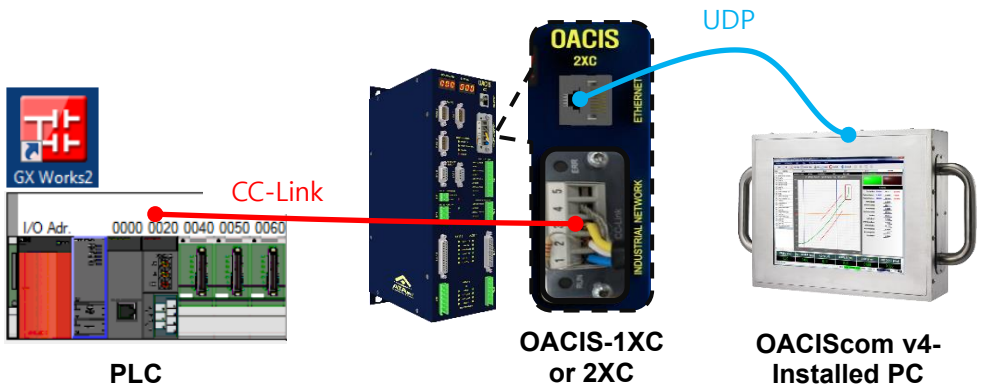
CONTENTS

I. SYSTEM CONFIGURATION

A. Overall Ethernet Connection



- During the initialization process, OACIS IP address shows on FND of the front panel for 2 seconds.
- Overall wiring can be different depending on the purpose of use. Generally, we recommend the above connection.

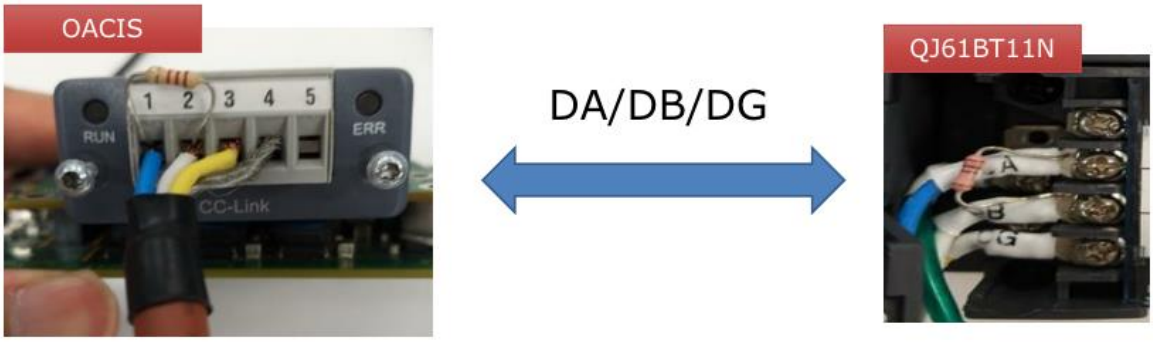
B. PLC System Requirement

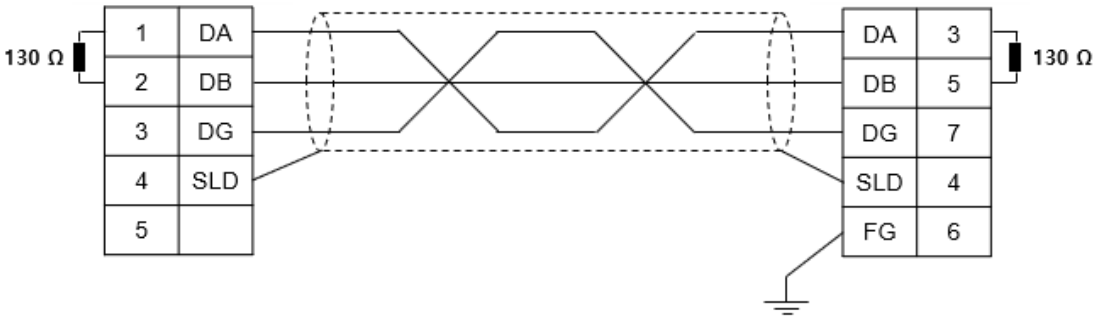
- Hardware : Mitsubishi Q series CPU, CC-Link Module, #QJ61BT11N
- Software : GX Works2 or higher

C. PLC System Configuration Example

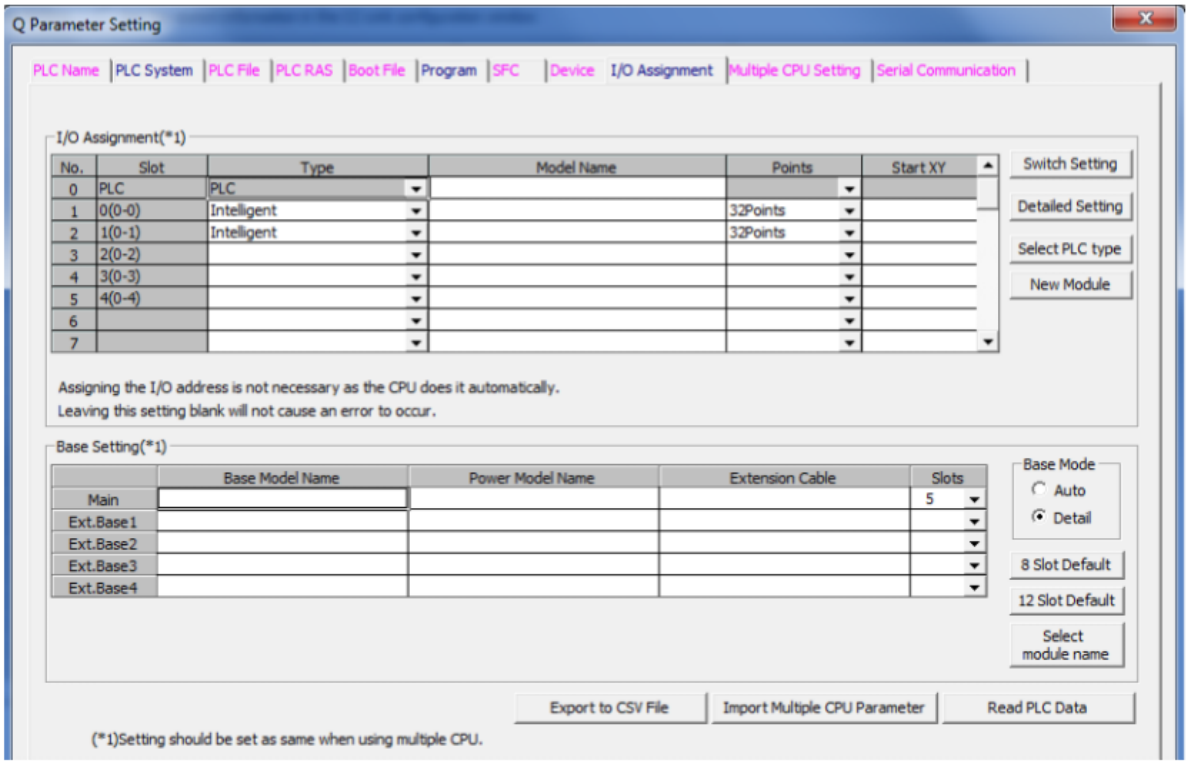
- CPU : Q02U
- Intelligent Module 1 : QJ71E71-100
- Intelligent Module 2 : QJ61BT11N
- GX Work2

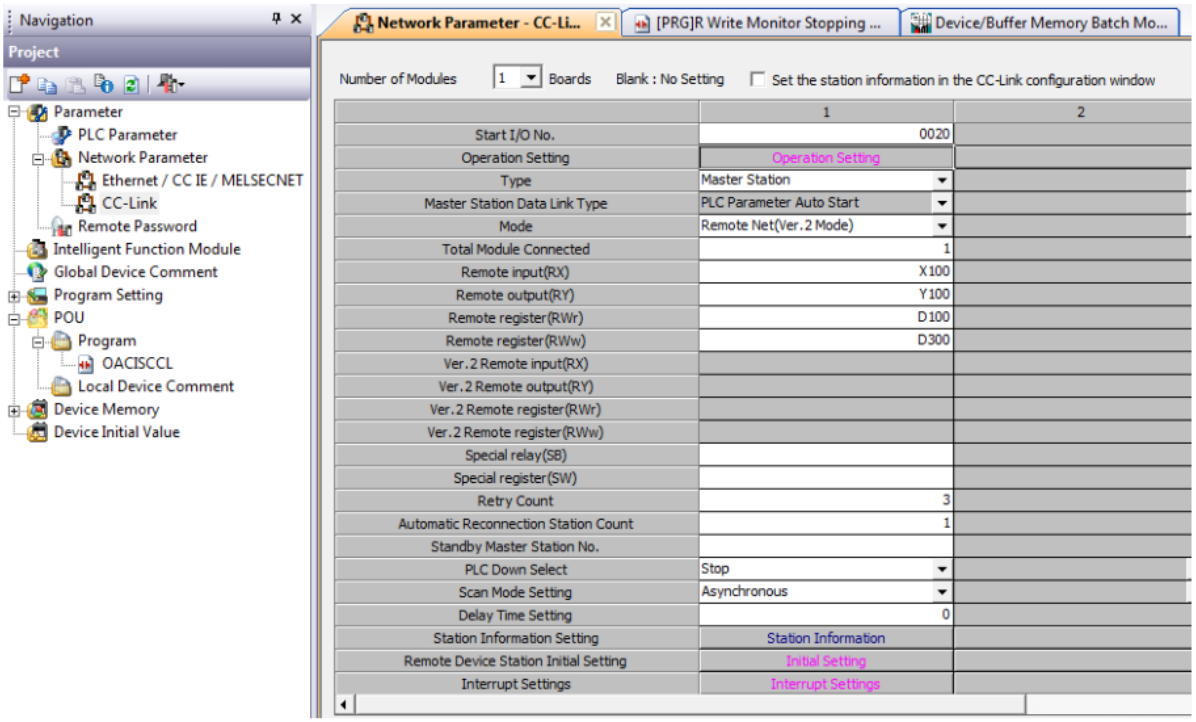
D. PLC Wiring



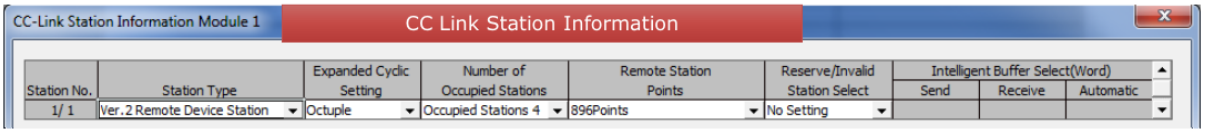


E. PLC Parameter Setting





- Type : Master Station
- Mode : Romote Net (Ver.2 Mode) should be selected.
- Total Module Connected : The number of current connected modules. If CC-Link is connected to only OACIS, it is supposed to be 1.



- OACIS needs 244 bytes of inputs and outputs for fieldbus communications with PLC respectively.
- In order to use 244 bytes, users should select Station Type(Ver.2), Expanded cyclic Setting(Octuple), Number of Occupied Stations(4) and Remote Station Points(896Points).

CC-Link Version 2

By implementing the attribute attribute Network Settings (#4) in the CC-Link Host Object (F7h) it is possible to customize the implementation for CC-Link version 2 and use larger data sizes through extension cycles. In such case, the following sizes are possible:

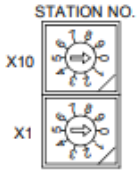
Occupied Stations	1 Extension Cycle		2 Extension Cycles		4 Extension Cycles		8 Extension Cycles	
	Points	Total	Points	Total	Points	Total	Points	Total
1	32 bits	12 bytes	32 bits	20 bytes	64 bits	40 bytes	128 bits	80 bytes
	4 words		8 words		16 words		32 words	
2	64 bits	24 bytes	96 bits	44 bytes	192 bits	88 bytes	384 bits	176 bytes
	8 words		16 words		32 words		64 words	
3	96 bits	36 bytes	160 bits	68 bytes	320 bits	136 bytes	640 bits	272 bytes
	12 words		24 words		48 words		96 words	
4	128 bits	48 bytes	224 bits	92 bytes	448 bits	184 bytes	896 bits	368 bytes
	16 words		32 words		64 words		128 words	

- Then, CC-Link can transfer and receive 896 bits and 128 words(256 bytes) with OACIS.

- But OACIS can use only system area of bit memory and word memory.

Remote input(RX)	X100
Remote output(RY)	Y100
Remote register(RWr)	D100
Remote register(RWw)	D300

- RX: Bit memory 896 points from X100 are available.
- RY: Bit memory 896 points from Y100 are available.
- RWr: Read memory 128 words from D100 are available.
- RWw: Write memory 128 words from D300 are available.
- X100, Y100, D100 and D300 addresses can be modified but be careful for their domains not to overlap with each other.

Station No. setting switch 	Set the module's station No. (Default setting: 0) <Setting range> Master station : 0 Local station : 1 to 64 Standby master station : 1 to 64 The "ERR." LED will turn ON if a value other than 0 to 64 is set.

Transmission rate/ mode setting switch 	Set the module's transmission rate and operation state. (Default setting: 0)		
	No.	Transmission rate setting	Mode
	0	Transmission rate 156kbps	On-line
	1	Transmission rate 625kbps	
	2	Transmission rate 2.5Mbps	
	3	Transmission rate 5Mbps	
	4	Transmission rate 10Mbps	
	5	Transmission rate 156kbps	Line test When station NO. setting switch is 0: Line test 1 When station NO. setting switch is 1 to 64: Line test 2
	6	Transmission rate 625kbps	
	7	Transmission rate 2.5Mbps	
	8	Transmission rate 5Mbps	
	9	Transmission rate 10Mbps	
	A	Transmission rate 156kbps	Hardware test
	B	Transmission rate 625kbps	
	C	Transmission rate 2.5Mbps	
	D	Transmission rate 5Mbps	
	E	Transmission rate 10Mbps	
	F	Setting is inhibited.	

- PLC should be the master station.
- Transmission rate : 2 (2.5Mbps, default) If PLC wants to change the rate, baud rate should also be updated equally with it in fieldbus module config of OACIScom User Config.

F. PLC Program

- To get started, the above rung should be added on your main routine
- These addresses can be changed according to RX and RY address.
- X478 and Y478 are from the below setting.
- If starting address, X100 is converted to decimal, it is 256.
  0x478 = Starting address (0x100 / 256) + 896 points – 1 - 7 = 1144 (0x478)

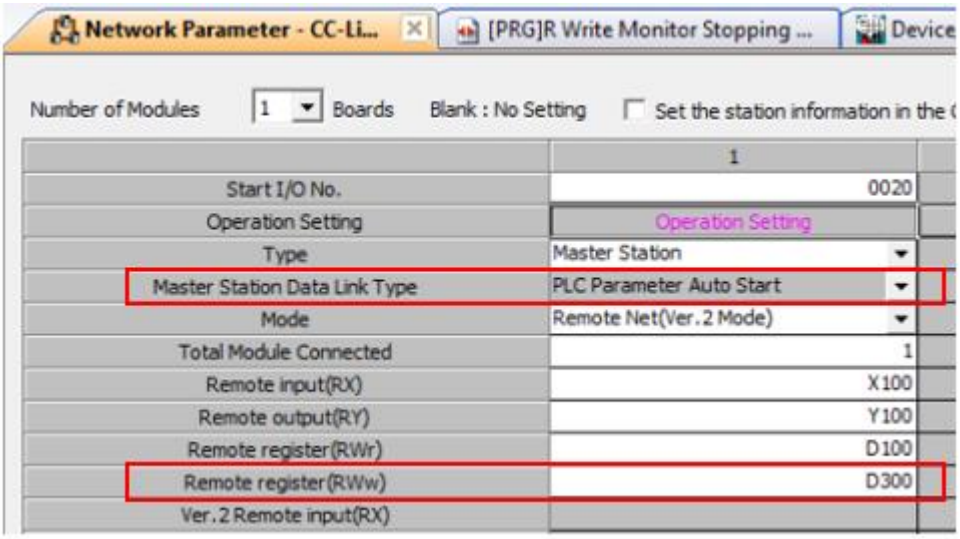
Remote input(RX)	X100
Remote output(RY)	Y100

Station No.	Station Type	Expanded Cyclic Setting	Number of Occupied Stations	Remote Station Points
1/ 1	Ver.2 Remote Device Station	Octuple	Occupied Stations 4	896Points

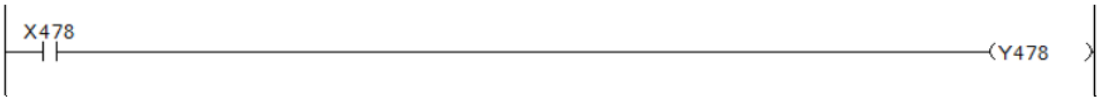
G. Application I

- OACIS-1XC 제어기 1대를 사용한다면 아래와 같이 사용할 수 있습니다.

  -. Total Module Connected : 1
  -. Remote Input(RX) : X100
  -. Remote Output(RY) : Y100
  -. Remote Register(RWr) : D100
  -. Remote Register(RWw) : D300 (larger than D228 = D100 + D128 x 1)



- To get started, the below rungs should be added on your main routine



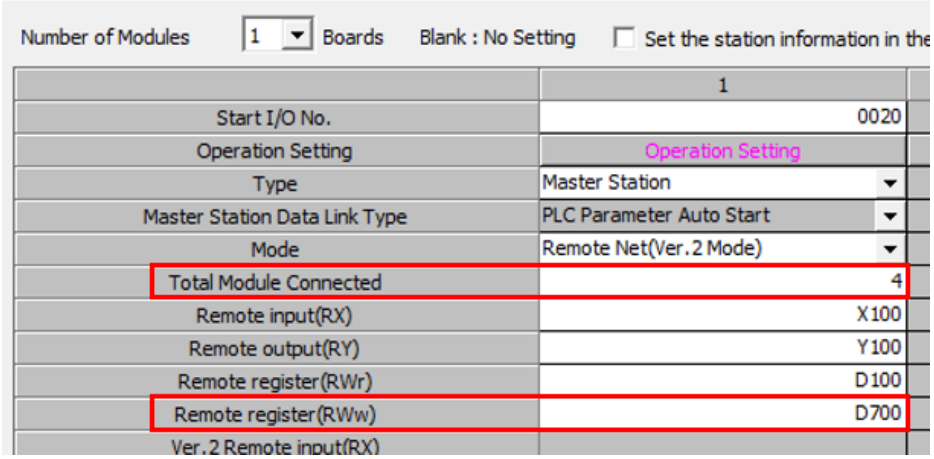
- Memory Mapping

Write (OACIS --> PLC)						
Type	Length (items)	Length (bytes)	Byte Index	Bit Index	OACIS	CC-LINK
DO	48	6	0	0	Home OK	D100.0
				1	Program Home OK	D100.1
				2	Ready	D100.2
				3	Error	D100.3
				4	Program End	D100.4
				5	E-Stop	D100.5
				6	Heartbeat	D100.6
				7	Reserved	
			1	0	Program Set Out 1	D100.8
				1	Program Set Out 2	D100.9
				2	Program Set Out 4	D100.A
				3	Program Set Out 8	D100.B
				4	Program Set Out 16	D100.C
				5	Program Set Out 32	D100.D
				6	Program Set Out 64	D100.E
				7	Reserved	
			2	0	Programmable DO 1	D101.0
				1	Programmable DO 2	D101.1
				2	Programmable DO 3	D101.2
				3	Programmable DO 4	D101.3
				4	Programmable DO 5	D101.4
				5	Programmable DO 6	D101.5
				6	Programmable DO 7	D101.6
				7	Programmable DO 8	D101.7
			3	0	Programmable DO 9	D101.8
				1	Programmable DO 10	D101.9
				2	Programmable DO 11	D101.A
				3	Programmable DO 12	D101.B
				4	Programmable DO 13	D101.C
				5	Programmable DO 14	D101.D
				6	Reserved	
				7	Reserved	
			4	0	Status Binary 1	D102.0
				1	Status Binary 2	D102.1
				2	Status Binary 4	D102.2
				3	Status Binary 8	D102.3
				4	Status Binary 16	D102.4
				5	Reserved	
				6	Reserved	
				7	Reserved	
			5	0~7	Reserved	
Real	45	180	6~9		Global Variable 1	D103~D104
			10~13		Global Variable 2	D105~D106
			...		...	
			182~185		Global Variable 45	D191~D192
Serial	1	58	186~243		Serial Number (ASCii)	D193~D221

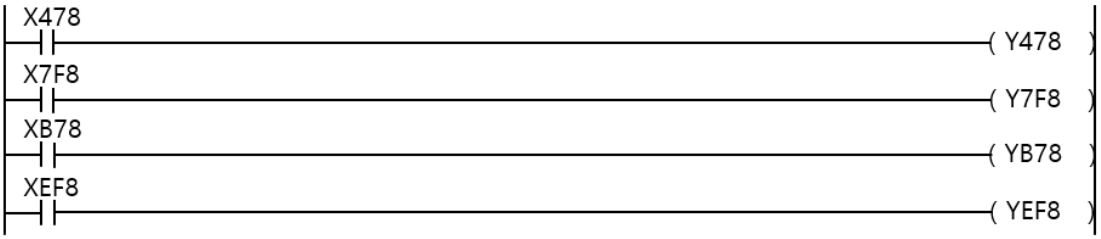
Read (PLC --> OACIS)						
Type	Length (items)	Length (bytes)	Byte Index	Bit Index	OACIS	CC-LINK
DI	48	6	0	0	Program Start	D300.0
				1	Program Stop	D300.1
				2	Return Home	D300.2
				3	Reset	D300.3
				4	Program Set Strobe	D300.4
				5	Reserved	
				6	Reserved	
				7	Reserved	
			1	0	Program Set In 1	D300.8
				1	Program Set In 2	D300.9
				2	Program Set In 4	D300.A
				3	Program Set In 8	D300.B
				4	Program Set In 16	D300.C
				5	Program Set In 32	D300.D
				6	Program Set In 64	D300.E
				7	Reserved	
			2	0	Programmable DI 1	D301.0
				1	Programmable DI 2	D301.1
				2	Programmable DI 3	D301.2
				3	Programmable DI 4	D301.3
				4	Programmable DI 5	D301.4
				5	Programmable DI 6	D301.5
				6	Programmable DI 7	D301.6
				7	Programmable DI 8	D301.7
			3	0	Programmable DI 9	D301.8
				1	Programmable DI 10	D301.9
				2	Programmable DI 11	D301.A
				3	Programmable DI 12	D301.B
				4	Programmable DI 13	D301.C
				5	Programmable DI 14	D301.D
				6	Reserved	
				7	Reserved	
			4	0	Reserved	
				1	Reserved	
				2	Reserved	
				3	Reserved	
				4	Reserved	
				5	Reserved	
				6	Reserved	
				7	Reserved	
			5	0~7	Reserved	
Real	45	180	6~9		Global Variable 1	D303~D304
			10~13		Global Variable 2	D305~D306
			...		...	
			182~185		Global Variable 45	D391~D392
Serial	1	58	186~243		Serial Number (ASCii)	D393~D421

H. Application II

- If you use four OACIS-1XC controllers in succession, you need to modify or add the following.
  -. Total Module Connected : 4
  -. Remote Input(RX) : X100
  -. Remote Output(RY) : Y100
  -. Remote Register(RWr) : D100
  -. Remote Register(RWw) : D600 (larger than D612 = D100 + D128 x 4)



- To get started, the below rungs should be added on your main routine



- Memory mapping

Write (OACIS --> PLC)									
Type	Length (items)	Length (bytes)	Byte Index	Bit Index	OACIS	CC-LINK (1국)	CC-LINK (5국)	CC-LINK (9국)	CC-LINK (13국)
DO	48	6	0	0	Home OK	D100.0	D228.0	D356.0	D484.0
				1	Program Home OK	D100.1	D228.1	D356.1	D484.1
				2	Ready	D100.2	D228.2	D356.2	D484.2
				3	Error	D100.3	D228.3	D356.3	D484.3
				4	Program End	D100.4	D228.4	D356.4	D484.4
				5	E-Stop	D100.5	D228.5	D356.5	D484.5
				6	Heartbeat	D100.6	D228.6	D356.6	D484.6
				7	Reserved				
			1	0	Program Set Out 1	D100.8	D228.8	D356.8	D484.8
				1	Program Set Out 2	D100.9	D228.9	D356.9	D484.9
				2	Program Set Out 4	D100.A	D228.A	D356.A	D484.A
				3	Program Set Out 8	D100.B	D228.B	D356.B	D484.B
				4	Program Set Out 16	D100.C	D228.C	D356.C	D484.C
				5	Program Set Out 32	D100.D	D228.D	D356.D	D484.D
				6	Program Set Out 64	D100.E	D228.E	D356.E	D484.E
				7	Reserved				
			2	0	Programmable DO 1	D101.0	D229.0	D357.0	D485.0
				1	Programmable DO 2	D101.1	D229.1	D357.1	D485.1
				2	Programmable DO 3	D101.2	D229.2	D357.2	D485.2
				3	Programmable DO 4	D101.3	D229.3	D357.3	D485.3
				4	Programmable DO 5	D101.4	D229.4	D357.4	D485.4
				5	Programmable DO 6	D101.5	D229.5	D357.5	D485.5
				6	Programmable DO 7	D101.6	D229.6	D357.6	D485.6
				7	Programmable DO 8	D101.7	D229.7	D357.7	D485.7
			3	0	Programmable DO 9	D101.8	D229.8	D357.8	D485.8
				1	Programmable DO 10	D101.9	D229.9	D357.9	D485.9
				2	Programmable DO 11	D101.A	D229.A	D357.A	D485.A
				3	Programmable DO 12	D101.B	D229.B	D357.B	D485.B
				4	Programmable DO 13	D101.C	D229.C	D357.C	D485.C
				5	Programmable DO 14	D101.D	D229.D	D357.D	D485.D
				6	Reserved				
				7	Reserved				
			4	0	Status Binary 1	D102.0	D230.0	D358.0	D486.0
				1	Status Binary 2	D102.1	D230.1	D358.1	D486.1
				2	Status Binary 4	D102.2	D230.2	D358.2	D486.2
				3	Status Binary 8	D102.3	D230.3	D358.3	D486.3
				4	Status Binary 16	D102.4	D230.4	D358.4	D486.4
				5	Reserved				
				6	Reserved				
				7	Reserved				
			5	0~7	Reserved				
Real	45	180	6~9		Global Variable 1	D103~D104	D231~D232	D359~D360	D487~D488
			10~13		Global Variable 2	D105~D106	D233~D234	D361~D362	D489~D490
			...		...				
			182~185		Global Variable 45	D191~D192	D319~D320	D447~D448	D575~D576
Serial	1	58	186~243		Serial Number (ASCII)	D193~D221	D321~D349	D449~D477	D577~D605

Read (PLC --> OACIS)									
Type	Length (items)	Length (bytes)	Byte Index	Bit Index	OACIS	CC-LINK (1국)	CC-LINK (5국)	CC-LINK (9국)	CC-LINK (13국)
DI	48	6	0	0	Program Start	D700.0	D828.0	D956.0	D1084.0
				1	Program Stop	D700.1	D828.1	D956.1	D1084.1
				2	Return Home	D700.2	D828.2	D956.2	D1084.2
				3	Reset	D700.3	D828.3	D956.3	D1084.3
				4	Program Set Strobe	D700.4	D828.4	D956.4	D1084.4
				5	Reserved	D700.5	D828.5	D956.5	D1084.5
				6	Reserved	D700.6	D828.6	D956.6	D1084.6
				7	Reserved				
			1	0	Program Set In 1	D700.8	D828.8	D956.8	D1084.8
				1	Program Set In 2	D700.9	D828.9	D956.9	D1084.9
				2	Program Set In 4	D700.A	D828.A	D956.A	D1084.A
				3	Program Set In 8	D700.B	D828.B	D956.B	D1084.B
				4	Program Set In 16	D700.C	D828.C	D956.C	D1084.C
				5	Program Set In 32	D700.D	D828.D	D956.D	D1084.D
				6	Program Set In 64	D700.E	D828.E	D956.E	D1084.E
				7	Reserved				
			2	0	Programmable DI 1	D701.0	D829.0	D957.0	D1085.0
				1	Programmable DI 2	D701.1	D829.1	D957.1	D1085.1
				2	Programmable DI 3	D701.2	D829.2	D957.2	D1085.2
				3	Programmable DI 4	D701.3	D829.3	D957.3	D1085.3
				4	Programmable DI 5	D701.4	D829.4	D957.4	D1085.4
				5	Programmable DI 6	D701.5	D829.5	D957.5	D1085.5
				6	Programmable DI 7	D701.6	D829.6	D957.6	D1085.6
				7	Programmable DI 8	D701.7	D829.7	D957.7	D1085.7
			3	0	Programmable DI 9	D701.8	D829.8	D957.8	D1085.8
				1	Programmable DI 10	D701.9	D829.9	D957.9	D1085.9
				2	Programmable DI 11	D701.A	D829.A	D957.A	D1085.A
				3	Programmable DI 12	D701.B	D829.B	D957.B	D1085.B
				4	Programmable DI 13	D701.C	D829.C	D957.C	D1085.C
				5	Programmable DI 14	D701.D	D829.D	D957.D	D1085.D
				6	Reserved				
				7	Reserved				
			4	0	Reserved	D702.0	D830.0	D958.0	D1086.0
				1	Reserved	D702.1	D830.1	D958.1	D1086.1
				2	Reserved	D702.2	D830.2	D958.2	D1086.2
				3	Reserved	D702.3	D830.3	D958.3	D1086.3
				4	Reserved	D702.4	D830.4	D958.4	D1086.4
				5	Reserved				
				6	Reserved				
				7	Reserved				
			5	0~7	Reserved				
Real	45	180	6~9		Global Variable 1	D703~D704	D831~D832	D959~D960	D1087~D1088
			10~13		Global Variable 2	D705~D706	D833~D834	D961~D962	D1089~D1090
			...		...				
			182~185		Global Variable 45	D791~D792	D919~D920	D1047~D1048	D1175~D1176
Serial	1	58	186~243		Serial Number (ASCii)	D793~D821	D921~D949	D1049~D1077	D1177~D1205

APPENDIX #1: ANY BUS DATA MAP

: PLC communicates on the bus with OACIS via Industrial Network. Max. process data is 244 bytes between OACIS and PLC.

A. DIO Type

- Total length of Digital Outputs and Digital Inputs is 6 bytes respectively. The byte index ranges from 0 to 5. Each item size is 1 bit.

B. Real Type

- Total length of Real is 180 bytes respectively. The byte index ranges from 6 to 185. Each item size is 4 bytes.
- Real in PLC is the counterpart of global variables in OACIS.

➢ **Caution:** The type size of OACIS GV and PLC Real is different. The size of OACIS GV is 8 bytes but the one of PLC Real is 4 bytes. When OACIS sends or receives GV data with PLC, round-off error can occur due to the difference in size.

C. Serial Type

- Total length of Serial is 58 bytes respectively. The byte index ranges from 186 to 243.
- It is normally used for Serial Number.
- When OACIS writes Serial numbers to PLC, CR(0x0D) should be added in the last byte of serial bytes. On the contrary, if it reads from PLC, LF(0x0A) should be added.
- If you want to send “ABCD” as a serial number to OACIS, you need to update the tags as below. Byte[186] = A / Byte[187] = B / Byte[188] = C / Byte[189] = D / Byte[190] = 0x0A

REVISION

v1.00: Engineering Released

v1.01:

-. Reference Image Added in I.E

-. Images Updated in I.F

v1.02:

-. Memory mapping Updated in H

v1.03:

-. Setting Image & calculation Updated in G, H