Chapter 3: **DeviceNet**

3

It is compliant with Open Field Network DeviceNet, and can be connected with DeviceNet master or slave. Remote I/O communication and Explicit message communication can be executed at the same time.

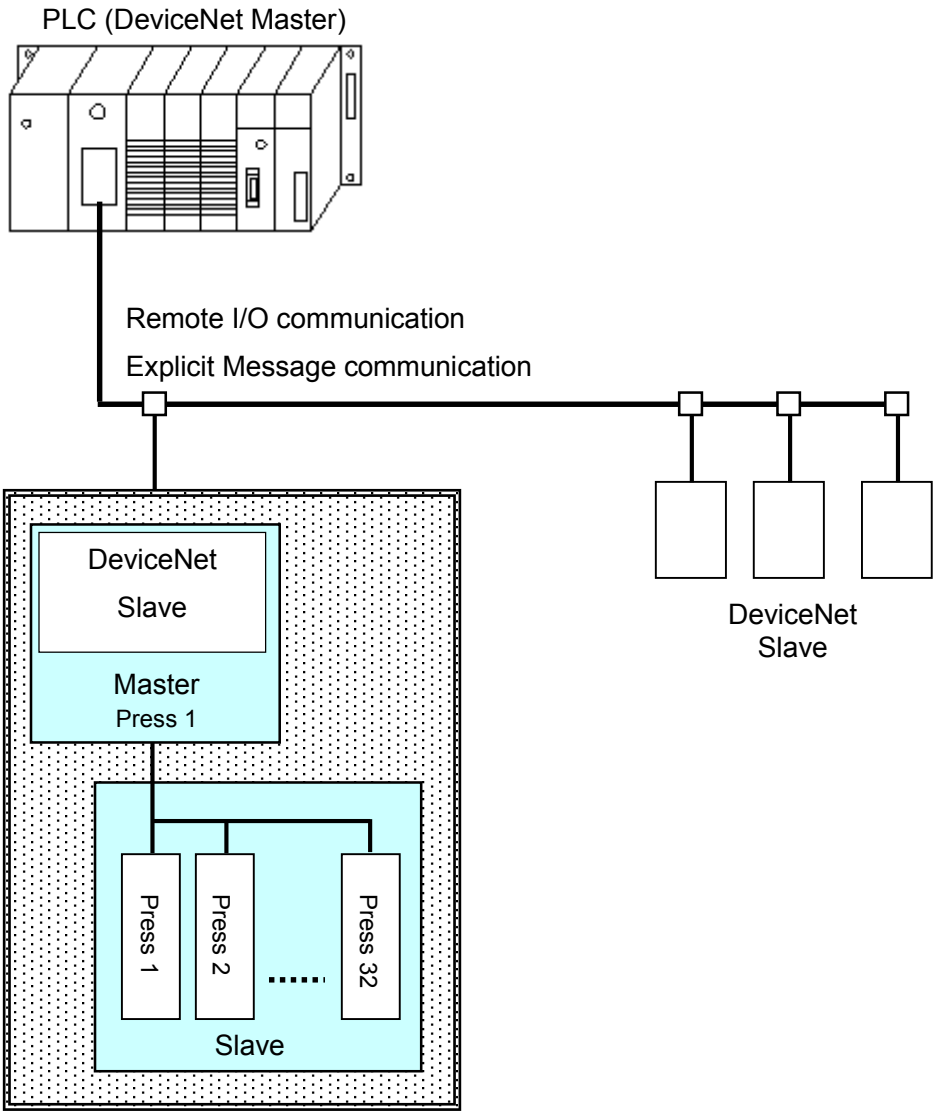
Remote I/O communication

- Input Signal
- Output Signal

Explicit message communication

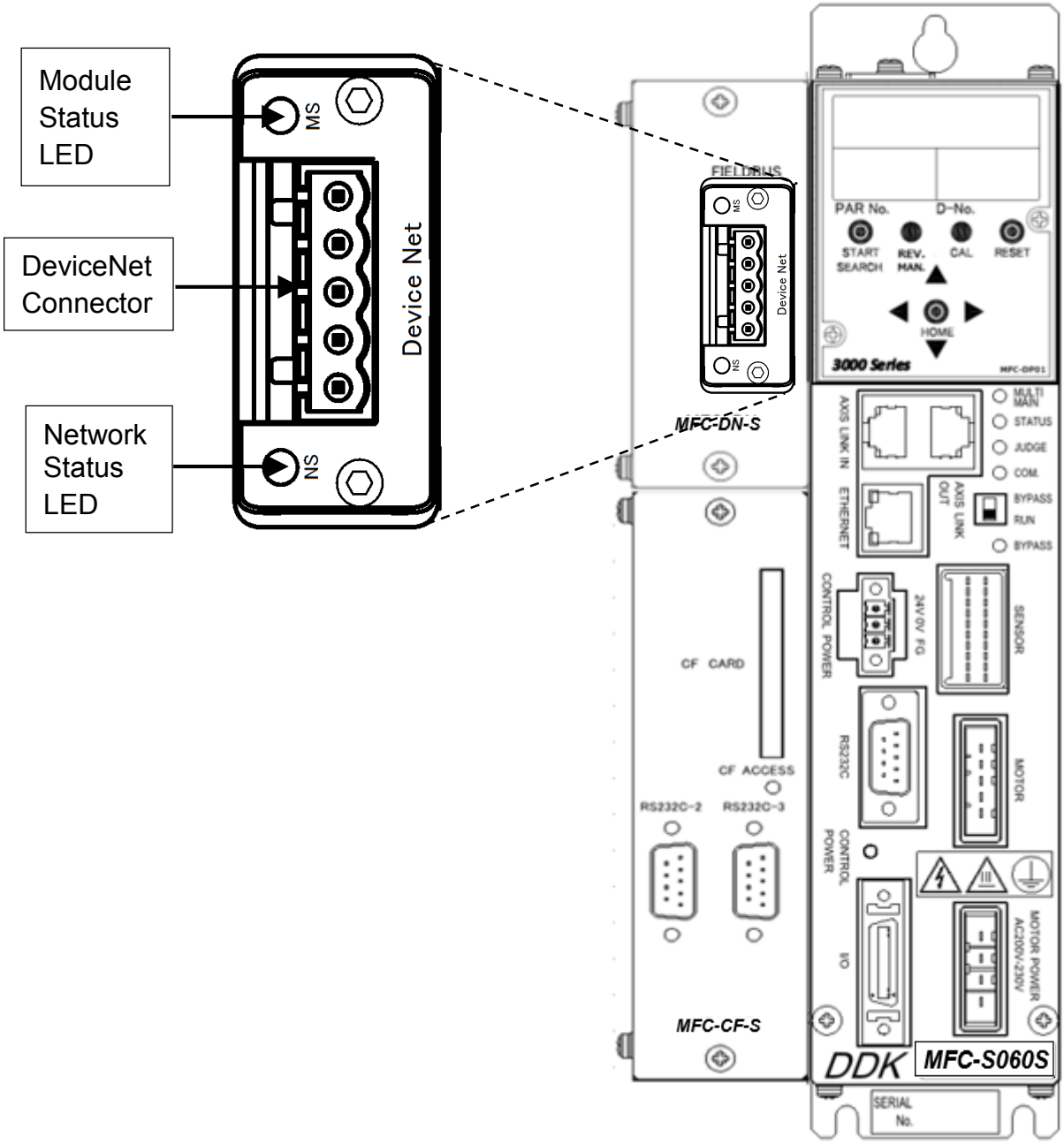
- Press Result Data
- ID (Barcode Data)

3-1. **System Structure**



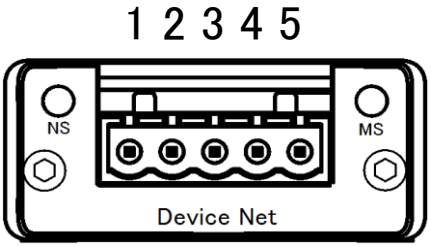
DSP3000 Multi System

3-2. **Hardware**


Module Status LED
DeviceNet Connector
Network Status LED
MS
NS
Device Net
MFC-DN-S
MFC-CF-S
CF CARD
CF ACCESS
RS232C-2
RS232C-3
PAR No.
D-No.
START SEARCH
REV. MAN.
CAL
RESET
HOME
3000 Series
AXIS LINK IN
ETHERNET
AXIS LINK OUT
STATUS
JUDGE
COM.
BYPASS
RUN
CONTROL POWER
24V 0V FG
SENSOR
RS232C
MOTOR
I/O
MOTOR POWER AC200V-230V
DDK
MFC-S060S
SERIAL No.

●Module Pin Configuration

No.	Signal	Wire Color	Description
1	V-	Black	Power cable - side
2	CAL L	Blue	Communication data Low side
3	SHUELD	-	Shield
4	CAL H	White	Communication data High
5	V+	Red	Power cable + side



Manufacturer: Phoenix Contact
Type: Connector plug
Model: MSTB 2.5/5-ST-5.08 AU M
Applicable wire size: AWG 14 ~ 23 or 0.25mm^2 ~ 2.5mm^2
* The connector is provided with the equipment.
Please prepare the cable on your own.

Applicable cable size and recommended rod terminals (Ferrule) are as follows:

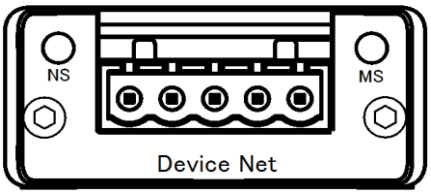
- Applicable cable size: AWG 23 to 14 (0.25 mm^2 to 2.5 mm^2)
- Recommended rod terminals (Ferrule) : Model AI 2,5-6 BU (Phoenix Contact)

Connect the cables with all the power supplies turned OFF.

●LED display

The module displays the module status of the DeviceNet system as well as the network status by LED.

A : Network Status LED



B : Module Status LED

LED		Color	State		Details
A	Network Status LED	OFF	Off	Offline	Offline or power is not supplied.
		Green	Lit up	Online	Communicating normally.
			Flash	Connection unestablished	Although online, connection is unestablished.
		Red	Lit up	Error	A critical error has occurred.
			Flash	Connection timeout	A connection timeout has occurred once or more.
		Red/ Green	Lit up	Repeated	Test mode
B	Module Status LED	OFF	Off	Power OFF	Power is not supplied.
		Green	Lit up	Online	Normal state
			Flash	Connection unestablished	Due to incomplete configuration or connection failure, the device must be re-recognized.
		Red	Lit up	Error	A critical error has occurred.
			Flash	Error	A recoverable error has occurred.
		Red/ Green	Lit up	Repeated	Test mode

3-3. I/O Signal Specifications

	I/O Input/Output		Message Input/Output	
	PRESS → PLC	PLC → PRESS	PRESS → PLC	PLC → PRESS
Maximum Setting	32 bytes (256 points)	12 bytes (96 points)	4096 bytes (2048 Ch.)	32 bytes (16 Ch.)
Standard Setting	32 bytes (256 points)	12 bytes (96 points)	4096 bytes (2048 Ch.)	32 bytes (16 Ch.)

3-3-1. Input Signals (PLC → PRESS)

All the input signal names are fixedly assigned (unchangeable).
For description of each input signal, refer to **【Input Signal List】** on Page 1-2 and 1-3.

Ch. No.	Bit	Signal Name	Ch. No.	Bit	Signal Name
Input Ch. No.1	0	Emergency Stop	Input Ch. No.3	0	Seq / Press 1
	1	Reset		1	Seq / Press 2
	2	Return		2	Seq / Press 3
	3	Start		3	Seq / Press 4
	4	Home		4	Seq / Press 5
	5	Jog		5	Seq / Press 6
	6	Seq / Press Select 0		6	Seq / Press 7
	7	Seq / Press Select 1		7	Seq / Press 8
	8	Seq / Press Select 2		8	Seq / Press 9
	9	Seq / Press Select 3		9	Seq / Press 10
	10	Seq / Press Select 4		10	Seq / Press 11
	11	Seq Select 5		11	Seq / Press 12
	12	Input Wait Port 1		12	Seq / Press 13
	13	Input Wait Port 2		13	Seq / Press 14
	14	Input Wait Port 3		14	Seq / Press 15
	15	Input Wait Port 4		15	Seq / Press 16
Input Ch. No.2	0	Press 1 Bypass	Input Ch. No.4	0	Seq / Press 17
	1	Press 2 Bypass		1	Seq / Press 18
	2	Press 3 Bypass		2	Seq / Press 19
	3	Press 4 Bypass		3	Seq / Press 20
	4	Press 5 Bypass		4	Seq / Press 21
	5	Press 6 Bypass		5	Seq / Press 22
	6	Press 7 Bypass		6	Seq / Press 23
	7	Press 8 Bypass		7	Seq / Press 24
	8	Press 9 Bypass		8	Seq / Press 25
	9	Press 10 Bypass		9	Seq / Press 26
	10	Cycle Count Up		10	Seq / Press 27
	11	Cycle Count Clear		11	Seq / Press 28
	12	Jog Speed Select		12	Seq / Press 29
	13	ID Data Clear		13	Seq / Press 30
	14	ID Select Enable		14	Seq / Press 31
	15	Seq / Press Select No.		15	Seq / Press 32

Ch. No.	Bit	Signal Name
Input Ch. No.5	0	Press 11 Bypass
	1	Press 12 Bypass
	2	Press 13 Bypass
	3	Press 14 Bypass
	4	Press 15 Bypass
	5	Press 16 Bypass
	6	Press 17 Bypass
	7	Press 18 Bypass
	8	Press 19 Bypass
	9	Press 20 Bypass
	10	Press 21 Bypass
	11	Press 22 Bypass
	12	Press 23 Bypass
	13	Press 24 Bypass
	14	Press 25 Bypass
	15	Press 26 Bypass
Input Ch. No.6	0	Press 27 Bypass
	1	Press 28 Bypass
	2	Press 29 Bypass
	3	Press 30 Bypass
	4	Press 31 Bypass
	5	Press 32 Bypass
	6	
	7	
	8	
	9	
	10	
	11	Message Press Offset Bit 0
	12	Message Press Offset Bit 1
	13	Message Press Offset Bit 2
	14	Message Press Offset Bit 3
	15	Message Press Offset Bit 4

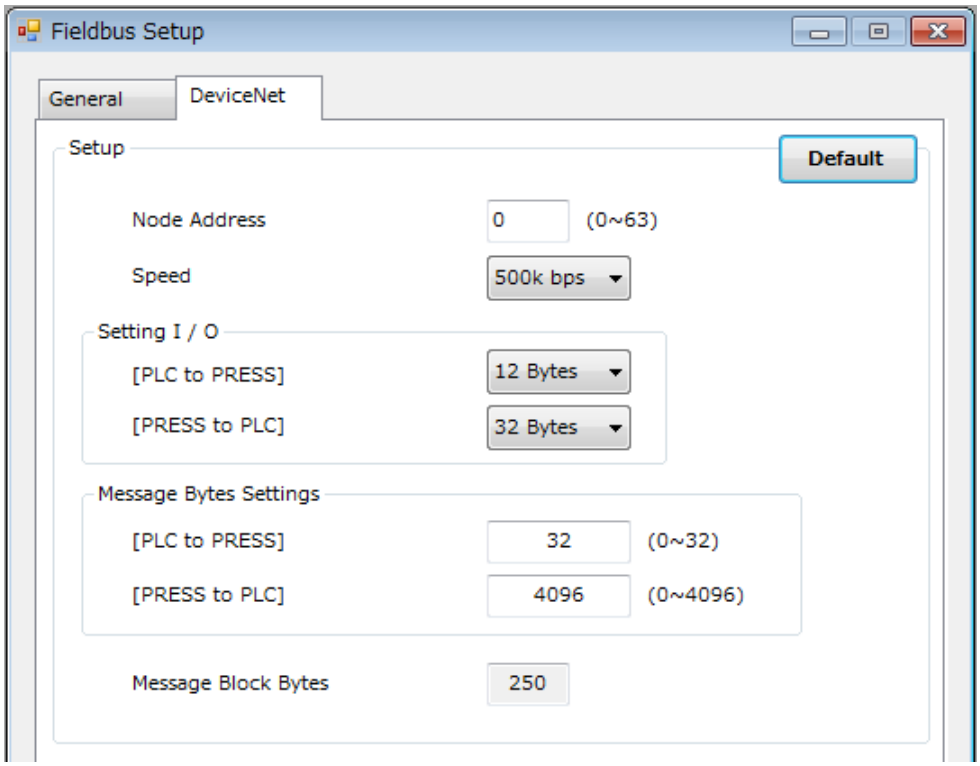
3-3-2. Output Signals (PRESS → PLC)

Output signal names are to be set by free assignment by users.
The signal names to output in [PLC Output Layout] on the User Console can be assigned here.
For description of each output signal, refer to **【Output Signal List】** on Page 1-7 to 1-9.

Ch. No.	Bit	Signal Name	Ch. No.	Bit	Signal Name
Output Ch. No.1	0	Total Accept	Output Ch. No.3	0	
	1	Total Reject		1	
	2	Press Abnormal		2	
	3	Ready		3	
	4	Busy		4	
	5	End		5	
	6			6	
	7			7	
	8			8	
	9	Seq / Press Select 0		9	
	10	Seq / Press Select 1		10	
	11	Seq / Press Select 2		11	
	12	Seq / Press Select 3		12	
	13	Seq / Press Select 4		13	
	14	Seq Select 5		14	
	15			15	
Output Ch. No.2	0		Output Ch. No.4	0	
	1			1	
	2			2	
	3			3	
	4			4	
	5			5	
	6			6	
	7			7	
	8			8	
	9			9	
	10			10	
	11			11	
	12			12	
	13			13	
	14			14	
	15			15	

Ch. No.	Bit	Signal Name	Ch. No.	Bit	Signal Name
Output Ch. No.13	0		Output Ch. No.15	0	
	1			1	
	2			2	
	3			3	
	4			4	
	5			5	
	6			6	
	7			7	
	8			8	
	9			9	
	10			10	
	11			11	
	12			12	
	13			13	
	14			14	
	15			15	
Output Ch. No.14	0		Output Ch. No.16	0	
	1			1	
	2			2	
	3			3	
	4			4	
	5			5	
	6			6	
	7			7	
	8			8	
	9			9	
	10			10	
	11			11	
	12			12	
	13			13	
	14			14	
	15			15	

3-4. **Fieldbus Setup**



Default

The factory setting is as shown below:

- Node address: 0
- Communication speed: 500kbps
- Length of I/O setting data [PLC → PRESS]: 12bytes [96bits]
- Length of I/O setting data [PRESS → PLC]: 32bytes [256bits]
- Length of Message data [PLC → PRESS]: 32bytes [256bits]
- Length of Message data [PRESS → PLC]: 250bytes [2000bits]

*The number of message blocks is fixed to 250bytes.

Speed

156kbps, 250kbps, 500kbps

Node Address

0 to 63

Setting I/O

- Data length: [PLC → PRESS] : 2bytes[16bits], 4bytes[32bits], ・・・12bytes[96bits]
- Data length: [PRESS → PLC] : 2bytes[16bits], 4bytes[32bits], ・・・32bytes[256bits]

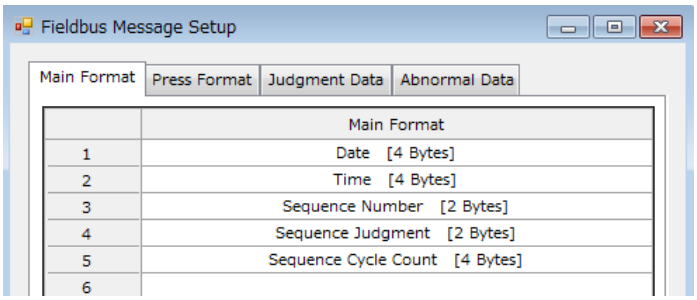
Message Bytes Settings

- Data length: [PLC → PRESS] : 0byte[0bit] to 32bytes[256bits]
- Data length: [PRESS → PLC] : 0byte[0bit] to 4096bytes[32768bits]

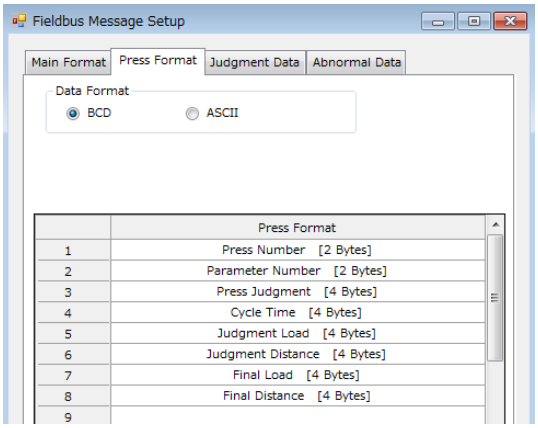
3-5. **Fieldbus Message (PRESS → PLC)**

For the output format of each result data, refer to Page 2-11 to 2-14.

Result Data Output Example



Press Operation: [Press 1] [Press 2]

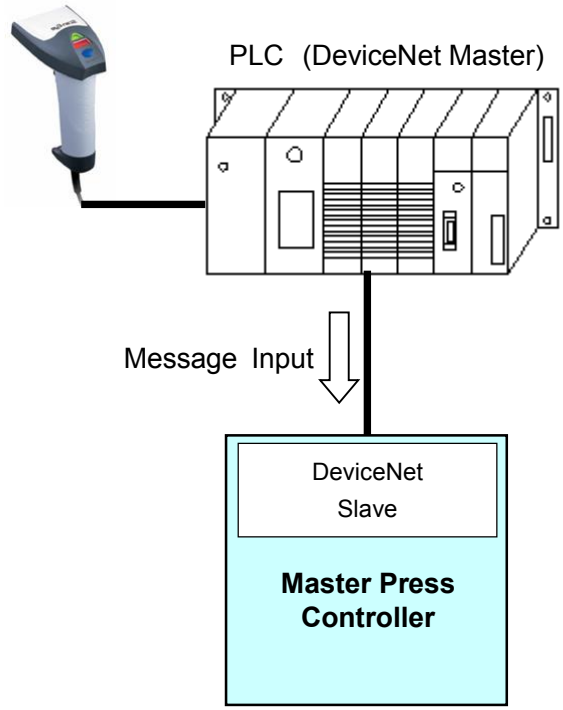


D2000	2015	Date	2015/8/25	Main
D2001	0825			
D2002	1234	Time	12:34:56	
D2003	5600			
D2004	0001	Seq. No.	1	
D2005	0001	Seq. Judg.	Reject	
D2006	0012	Seq. Cycle Count	123456	
D2007	3456			

D2008	0001	Press No.	1	Press 1
D2009	0002	Parameter No.	2	
D2010	0100	Press Judgment	Reject	
D2011	0000			
D2012	0001	Cycle Time	10.3	
D2013	0301			
D2014	0002	Judgment Load	2.86	
D2015	8602			
D2016	0857	Judgment Distance	85.726	
D2017	2603			
D2018	0010	Final Load	10.06	
D2019	0602			
D2020	1203	Final Distance	120.365	
D2021	6503			
D2022	0002	Press No.	2	Press 2
D2023	0002	Parameter No.	2	
D2024	0201	Press Judgment	Load Low Reject	
D2025	0001			
D2026	0001	Cycle Time	10.5	
D2027	0501			
D2028	0001	Judgment Load	1.26	
D2029	2602			
D2030	0860	Judgment Distance	86.016	
D2031	1603			
D2032	0008	Final Load	8.68	
D2033	6802			
D2034	1126	Final Distance	112.687	
D2035	8703			

3-6. **Fieldbus Message (PLC → PRESS)**

Input ID (Barcode data: maximum 32 characters in ASCII) as a message from PLC.



	+0	+1	+2	+3	+4	+5	+6	+7	+8	+9
D01000	AB	CD	EF	GH	IJ	KL	MN	12	34	56
D01010	78	90	Null (00H)							

Memo