Chapter 5: **Profinet I/O**

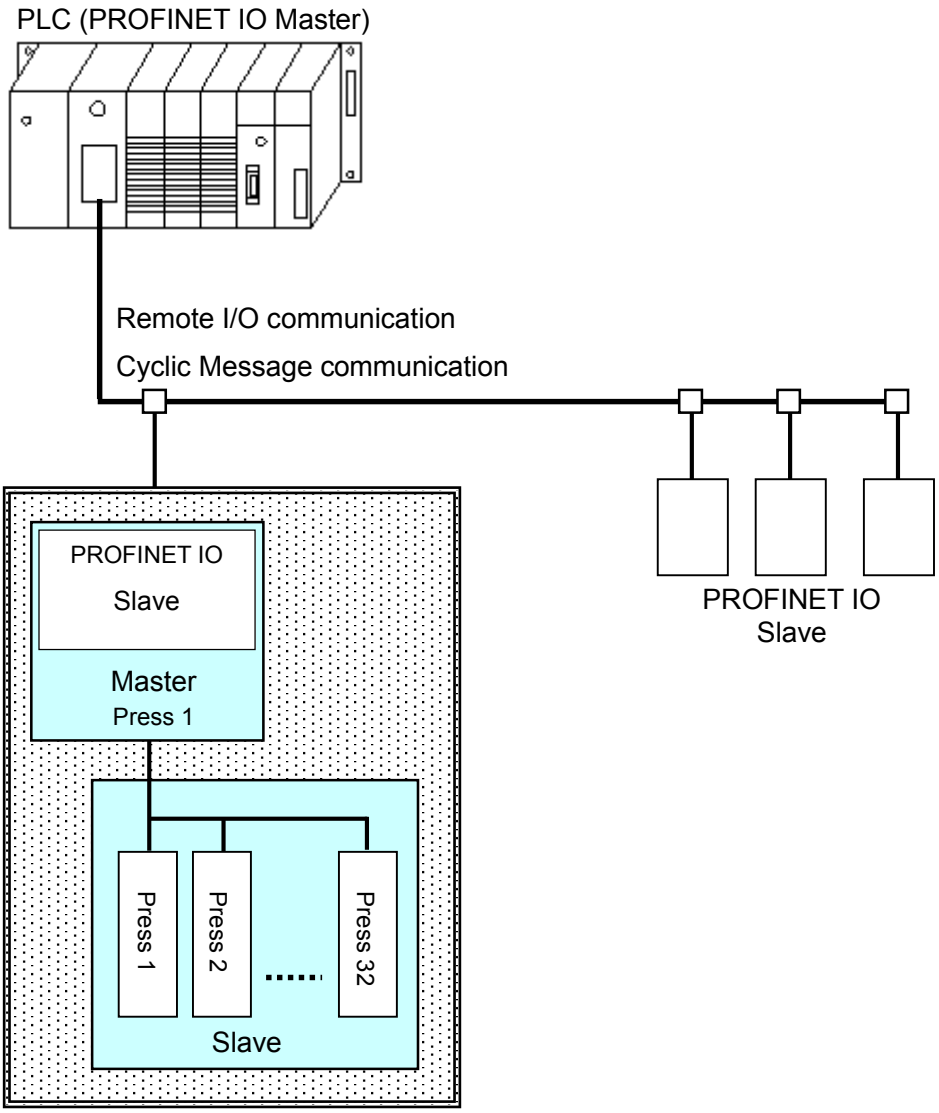
5

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

Remote I/O communication
- Input Signal
- Output Signal

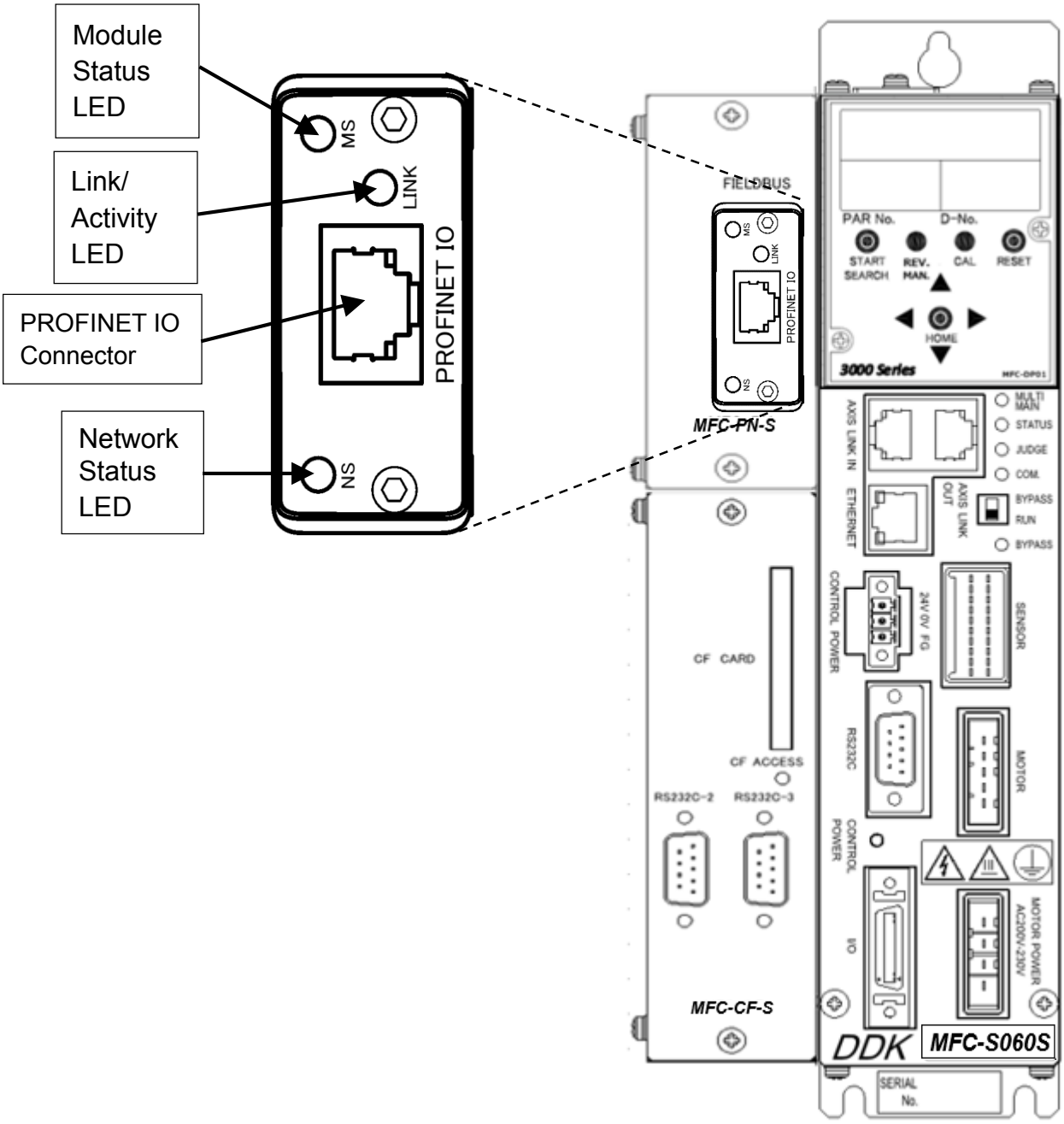
Cyclic message communication
- Press Result Data
- ID (Barcode Data)

5-1. **System Structure**



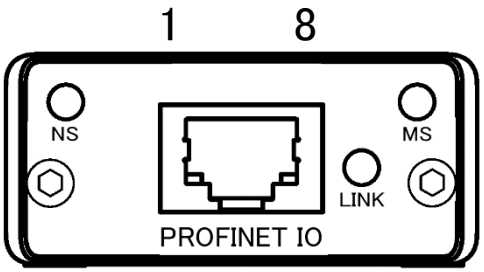
DSP3000 Multi System

5-2. **Hardware**


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

● Module Pin Configuration

No.	Signal	Description
1	TD+	Send data +
2	TD-	Send data -
3	RD+	Receive data +
4	-	Not used.
5	-	Not used.
6	RD-	Receive data -
7	-	Not used.
8	-	Not used.



∗The cables are not equipped.
The LAN cables of 5e or higher in category are to be supplied by the customer.

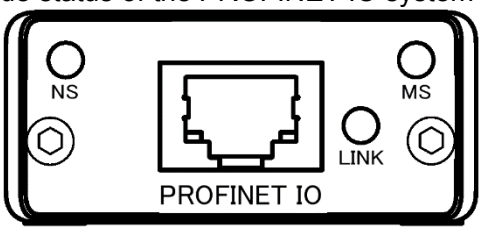
CAUTION

Connect the cable with all the power supplies turned to OFF.

● LED Display

Modules display the node status of the PROFINET IO system and the network condition by LED.

A : Network Status LED



B : Module Status LED

C : Link Activity 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	Communication unestablished	Although online, connection is unestablished.
		Red	Lit up	Error	A critical error has occurred. Redundant IP address.
			Flash	Connection timeout	A connection timeout has occurred once or more.
B	Module Status LED	Off	Off	Power OFF	Power is not supplied.
		Green	Lit up	Online	Normal state
			Flash	Communication 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.
C	Link Activity LED	Off	Off	Link unestablished	ETHERNET link is unestablished and communication is not performed.
		Green	Lit up	Not communicating	ETHERNET link is established but communication is not performed.
			Flash	Communicating	ETHERNET link is established and communication is in progress.

5-3. 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)	2048 words (4096 bytes)	16 words (32 bytes)
Standard Setting	32 bytes (256 points)	12 bytes (96 points)	2048 words (4096 bytes)	16 words (32 bytes)

5-3-1. 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 Pages 1-2 and 1-3.

Word No.	Bit	Signal Name	Word No.	Bit	Signal Name
Input Word No.1	0	Emergency Stop	Input Word 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 Word No.2	0	Press 1 Bypass	Input Word 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

Word No.	Bit	Signal Name
Input Word 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 Word 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

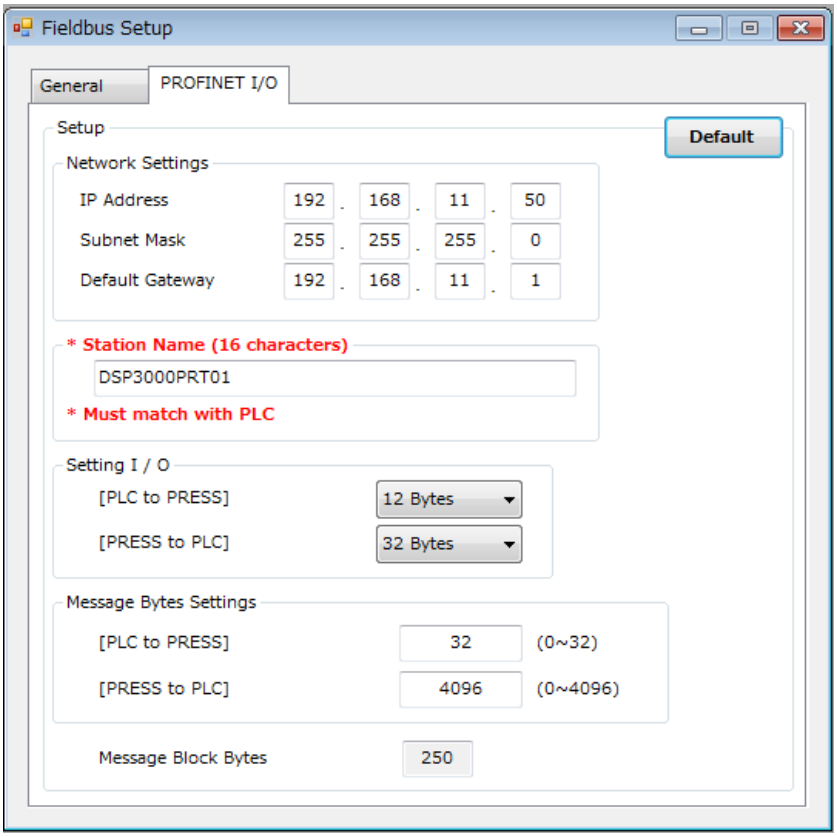
5-3-2. Output Signals (PRESS → PLC)

Output signal names are freely assigned 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 Pages 1-7 to 1-9.

Word No.	Bit	Signal Name	Word No.	Bit	Signal Name
Output Word No.1	0	Total Accept	Output Word 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 Word No.2	0		Output Word 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	

Word No.	Bit	Signal Name	Word No.	Bit	Signal Name
Output Word No.13	0		Output Word 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 Word No.14	0		Output Word 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	

5-4. **Fieldbus Setup**



Default

The factory setting is as shown below:

- Network setting
  - IP address: 192.168.11.50
  - Subnet mask: 2 55.255.255.0
  - Default gateway: 192.168.11.1
- Station name: DSP3000PRT01
- 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] : 4096bytes[32768bits]

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

Network Settings

- IP address: 0.0.0.0 to 255.255.255.255
- Subnet mask: 0.0.0.0 to 255.255.255.255
- Default gateway: 0.0.0.0 to 255.255.255.255

Station Name

ASCII character (Half-width alphanumeric characters, maximum 16 letters)

Name should match the registered name at PLC side.

Unmatched name will disable network connection with the PLC side.

Setting I/O

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

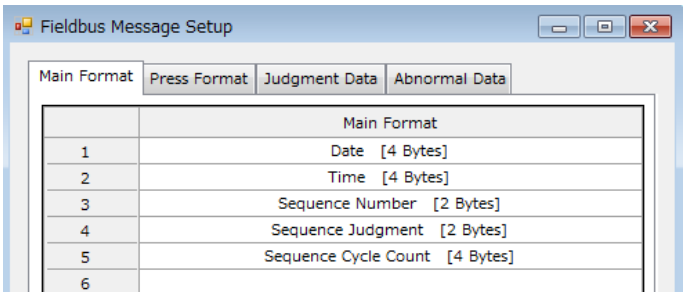
Message Bytes Settings

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

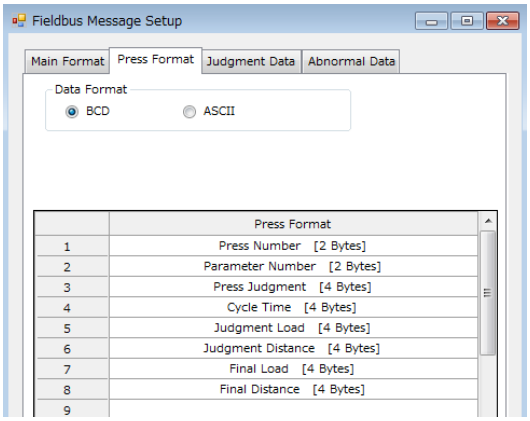
5-5. Fieldbus Message (PRESS → PLC)

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

Output Example of Result Data



Press Operation: [Press 1] [Press 2]

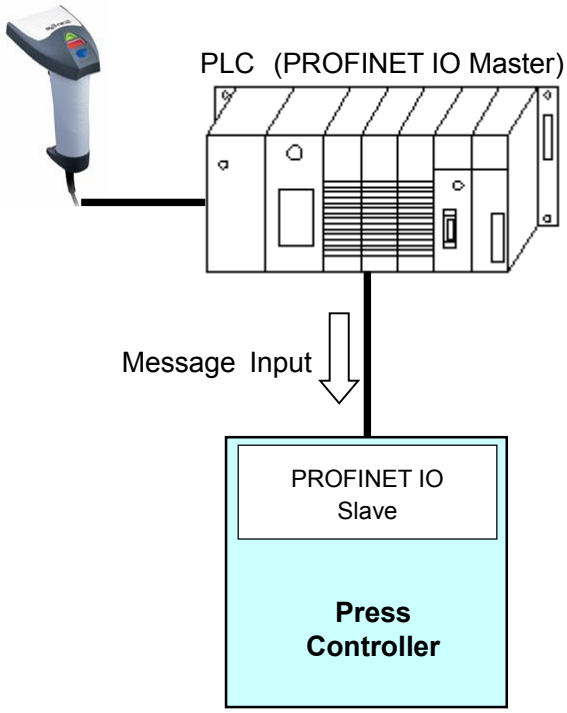


MW1000	2015	Date	2015/8/25	Main
MW1001	0825			
MW1002	1234	Time	12:34:56	
MW1003	5600			
MW1004	0001	Seq. No.	1	
MW1005	0001	Seq. Judg.	Reject	
MW1006	0012	Seq. Cycle Count	123456	
MW1007	3456			

MW1008	0001	Press No.	1	Press 1
MW1009	0002	Parameter No.	2	
MW1010	0100	Press Judgment	Reject	
MW1011	0000			
MW1012	0001	Cycle Time	10.3	
MW1013	0301			
MW1014	0002	Judgment Load	2.86	
MW1015	8602			
MW1016	0857	Judgment Distance	85.726	
MW1017	2603			
MW1018	0010	Final Load	10.06	
MW1019	0602			
MW1020	1203	Final Distance	120.365	
MW1021	6503			
MW1022	0002	Press No.	2	Press 2
MW1023	0002	Parameter No.	2	
MW1024	0201	Press Judgment	Load Low Reject	
MW1025	0001			
MW1026	0001	Cycle Time	10.5	
MW1027	0501			
MW1028	0001	Judgment Load	1.26	
MW1029	2602			
MW1030	0860	Judgment Distance	86.016	
MW1031	1603			
MW1032	0008	Final Load	8.68	
MW1033	6802			
MW1034	1126	Final Distance	112.687	
MW1035	8703			

5-6. **Fieldbus Message (PLC → PRESS)**

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



MW 2000	'AB'
MW 2001	'CD'
MW 2002	'EF'
MW 2003	'GH'
MW 2004	'IJ'
MW 2005	'KL'
MW 2006	'MN'
MW 2007	'12'
MW 2008	'34'
MW 2009	'56'
MW 2010	'78'
MW 2011	'90'
MW 2012	Null (00H)

Memo