

F701-S

OPTION

OPERATION MANUAL

15MAY2013REV.1.02

UNIPULSE

Introduction

This manual describes the optional interface of the F701-S.

When using the optional functions of the F701-S, please carefully read this manual and the F701-S Operation Manual for correct usage.

Readers of this document should have basic knowledge of the programming of the Mitsubishi general-purpose PLC and basic knowledge of the CC-Link I/F.

(CC-Link is an abbreviation for Control & Communication Link.)

Readers of this document should have basic knowledge of the programming of the OMRON PLC and basic knowledge of the DeviceNet I/F.

Readers of this document should have basic knowledge of the PLC and the PROFIBUS I/F.

Contents

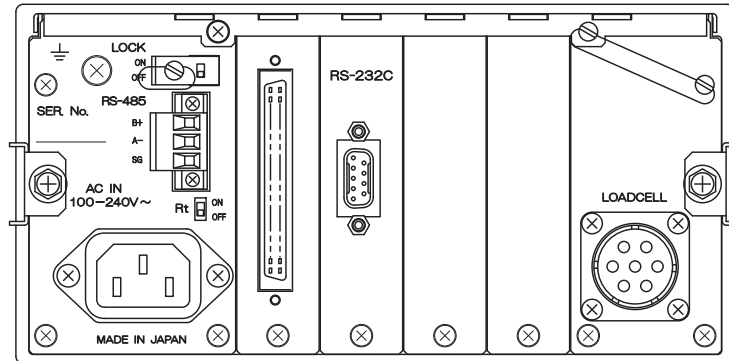
1. RS-232C INTERFACE [232]	1
1-1. Communication specifications	1
■ Specifications	1
■ Connector pin assignment	1
■ Cable	2
1-2. RS-232C-related setting values	2
■ RS-232C I/F setting (setting mode 7-5)	2
■ RS-232C communication type (setting mode 7-6)	3
■ Communication type	3
■ Send in auto mode when the gross weight is negative	4
1-3. Command communication formats	4
1-4. Setting value communication formats	11
1-5. Continuous and auto transmission format	13
2. BCD PARALLEL DATA OUTPUT INTERFACE (SINK TYPE) [BCO]	15
2-1. Specifications	15
2-2. BCD parallel data output interface related setting values	16
■ BCD data update rate (setting mode 8-1)	16
2-3. Connector pin assignments	16
■ How to assemble the connector	17
2-4. Equivalent circuit and example connection	17
2-5. BCD data output	18
2-6. Polarity output (MINUS)	18
2-7. Over status output (OVER)	18
2-8. Print command output (P.C)	19
2-9. Data strobe (STROBE)	19
2-10. Hold input	19
2-11. Logic switch input	19
2-12. Output data selection input	19
3. BCD PARALLEL DATA OUTPUT INTERFACE (SOURCE TYPE) [BSC]	20
3-1. Specifications	20
3-2. BCD parallel data output interface related setting values	21
■ BCD data update rate (setting mode 8-1)	21
3-3. Connector pin assignments	21
3-4. Equivalent circuit and example connection	22

3-5. BCD data output	23
3-6. Polarity output (MINUS)	23
3-7. Over status output (OVER)	23
3-8. Print command output (P.C)	23
3-9. Data strobe (STROBE)	24
3-10. Hold input	24
3-11. Logic switch input	24
3-12. Output data selection input	24
4. D/A CONVERTER INTERFACE [DAC]	25
4-1. Specifications	25
4-2. Name of each part	25
4-3. Connection of the voltage/current output terminals	26
4-4. Taking output signals	27
4-5. D/A converter interface related setting values	27
■ D/A zero output weight (setting mode 7-8)	27
■ D/A full scale value (setting mode 7-9)	27
■ D/A output mode (setting mode 7-7)	28
■ Relationship between each setting values	28
5. CC-Link INTERFACE [CCL]	29
5-1. Name of each part	29
5-2. CC-Link interface related setting values	30
■ Baud rate (setting mode 8-2)	30
■ Station number (setting mode 8-3)	30
■ Setting code selection (setting mode 8-2)	31
5-3. PLC address	31
5-4. Address map (data domain)	32
■ Remote resistor M → R (PLC → F701-S)	32
■ Explanation for remote resistor M → R	32
■ Remote resistor R → M (F701-S → PLC)	33
■ Explanation for remote resistor R → M	34
■ Command list	35
5-5. Address map (relay domain)	38
■ Remote output M → R (PLC → F701-S)	38
■ Remote input R → M (F701-S → PLC)	39
■ Remote output RY (PLC → F701-S) signal	41
■ Remote input RX (F701-S → PLC) signal	42
5-6. Setting procedure	44
■ Exclusive data area for setting value by request flag 1	44
■ General purpose data area for setting value, command No. by request flag 2	44
■ Reading out setting value	45

6. DeviceNet INTERFACE [ODN]	46
6-1. Dimensions	46
6-2. Name of each part	47
6-3. DeviceNet interface related setting values	48
■ Node address (setting mode 8-4)	48
6-4. About remote I/O	48
6-5. About PLC address	48
6-6. I/O format	49
■ Explanation of input data (F701-S → Master (PLC))	50
■ Explanation about output data (Master (PLC) → F701-S)	54
6-7. Write in from master to F701-S	57
6-8. Read out from F701-S to master	57
6-9. Command No. and each setting value	57
6-10. Command to F701-S from master	59
6-11. Timing of a command request and a command response	60
■ When each setup is read	60
■ When each setup is written in	60
7. PROFIBUS INTERFACE [PRF]	61
7-1. Specifications	61
7-2. Dimensions	61
7-3. Name of each part	62
7-4. PROFIBUS interface related setting values	63
■ DWORD (long word) mode (setting mode 8-5)	63
■ PROFIBUS baud rate display (setting mode 8-6)	63
■ Station No. (setting mode 8-7)	63
7-5. Address map	63
■ OUT data (6 words)	64
■ Explanation about OUT data	64
■ IN data (13 words)	68
■ Explanation about IN data	70
7-6. Read, write, and command procedures	74
■ Write procedure	74
■ Read procedure	75
■ Command procedure	76

1. RS-232C INTERFACE [232]

The RS-232C interface is intended to read the indicated value and status of the F701-S and read/write setting values with the F701-S. It is convenient for processing of control, compilation, recording, etc., as the F701-S is connected to a computer, PLC, etc..



1-1. Communication specifications

■ Specifications

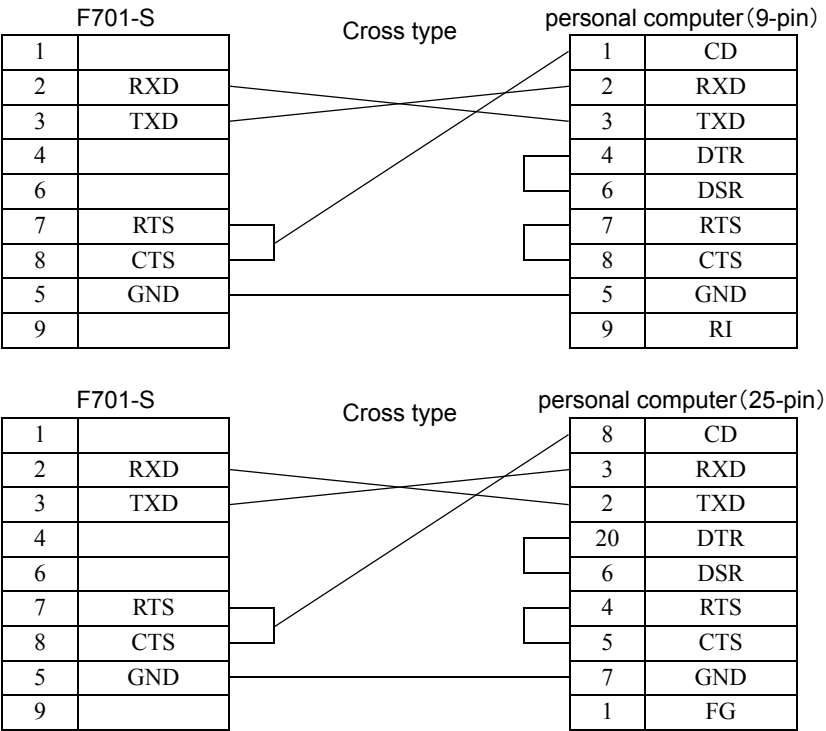
Signal level:	RS-232C-compliant	
Transmission distance:	Approx. 15m	
Transmission mode:	Asynchronous, full-duplex communication	
Transmission speed:	1200, 2400, 4800, 9600, 19200, 38400bps selectable	
Bit configuration:	Start bit	1 bit
	Length of character	7 or 8 bits selectable
	Stop bit	1 or 2 bits selectable
	Parity bit	None, odd, or even selectable
Code:	ASCII	

■ Connector pin assignment

The adaptable plug is 9-pin D-SUB connector

1			6		
2	in	RXD	7	out	RTS
3	out	TXD	8	in	CTS
4			9		
5	*	GND			

■ Cable



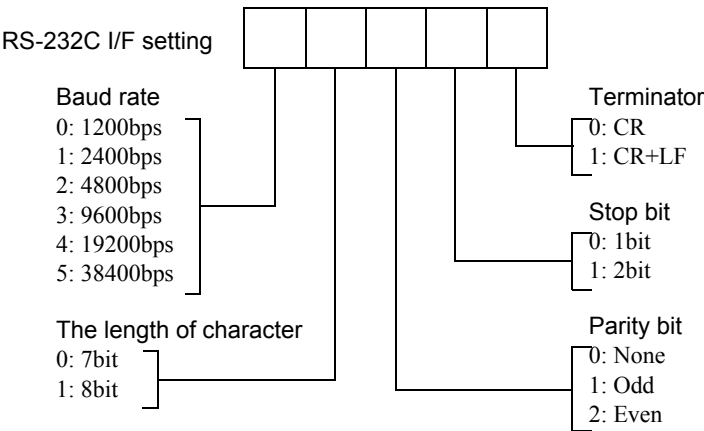
The above diagram is for connecting a personal computer as a DTE (Data Terminal Equipment) device. If it is a DCE (Data Circuit-terminating Equipment) device, connect pin to pin (DTR to DTR, DSR to DSR etc.).

Cables should be prepared after checking connector type and pin assignments of the connected device.

1-2. RS-232C-related setting values

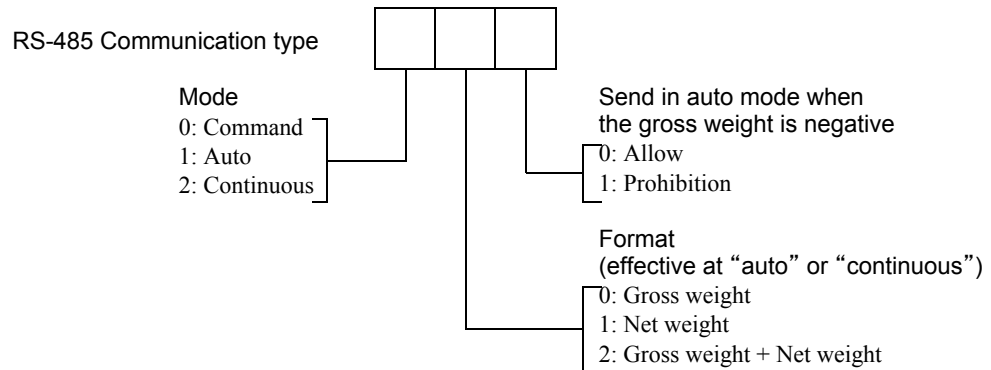
■ RS-232C I/F setting (setting mode 7-5)

1. Set the RS-232C port of this device.



2. Make initial settings of the RS-232C port of the personal computer, PLC, etc., connected according to the settings of this device.

■ RS-232C communication type (setting mode 7-6)



■ Communication type

- Communication type 0 (mode=0: Command)

Communication is performed with the command from the host computer.

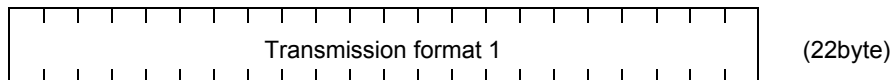
(Weight data is not transmitted automatically.)

Terminator is selectable from CR or CR + LF.

- Communication type 1 (mode=2: Continuous, format=0: Gross weight)

Gross weight is transmitted continuously.

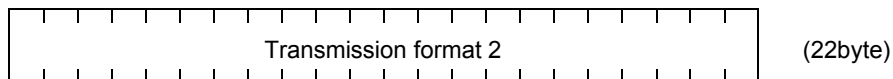
Various commands of R, W, and C are all ignored.



- Communication type 2 (mode=2: Continuous, format=1: Net weight)

Net weight is transmitted continuously.

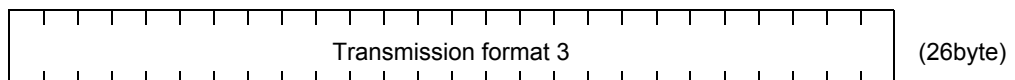
Various commands of R, W, and C are all ignored.



- Communication type 3 (mode=2: Continuous, format=2: Gross weight + net weight)

Gross weight and net weight are transmitted continuously.

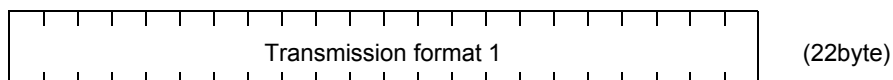
Various commands of R, W, and C are all ignored.



- Communication type 4 (mode=1: Auto, format=0: Gross weight)

Gross weight is transmitted once with the timing of completion.

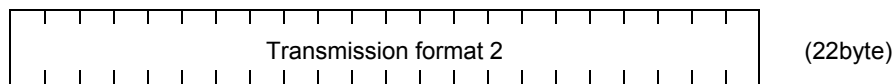
Various commands of R, W, and C are all ignored.



- Communication type 5 (mode=1: Auto, format=1: Net weight)

Net weight is transmitted once with the timing of completion.

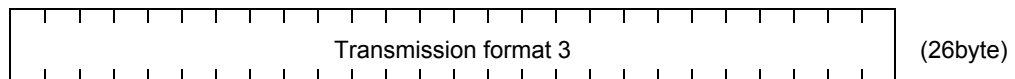
Various commands of R, W, and C are all ignored.



- Communication type 6 (mode=1: Auto, format=2: Gross weight + net weight)

Gross weight and net weight are transmitted once with the timing of completion.

Various commands of R, W, and C are all ignored.



Attention

For transmission formats, see "1-5.Continuous and auto transmission format" on page 13.



Point

About the timing for continuous transmission

According to the communication baud rate setting, the continuous transmission intervals in the case where any of the communication types from 1 to 2 is selected are as follows:

Communication baud rate	Continuous transmission interval
38400 bps	100 times/sec.
19200 bps	50 times/sec.
9600 bps	25 times/sec.
4800 bps	12 times/sec.
2400 bps	6 times/sec.
1200 bps	3 times/sec.

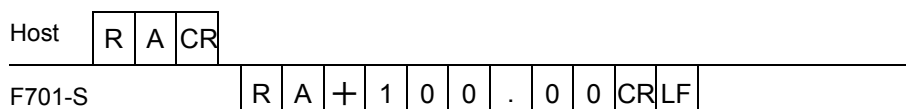
■ Send in auto mode when the gross weight is negative

Select whether or not to allow transmission in auto mode when the gross weight is negative.

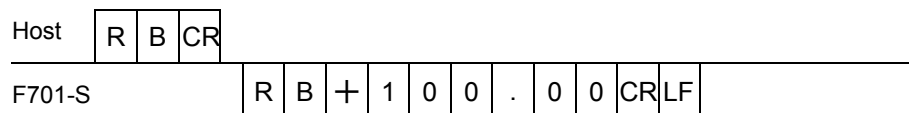
* This setting is valid only when the communication mode setting is auto and the communication format setting is "0: Gross weight" or "2: Gross weight + net weight".

1-3. Command communication formats

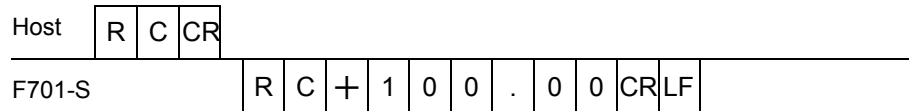
- Read the gross weight (sign, 5-digit weight, decimal point)



- Read the net weight (sign, 5-digit weight, decimal point)

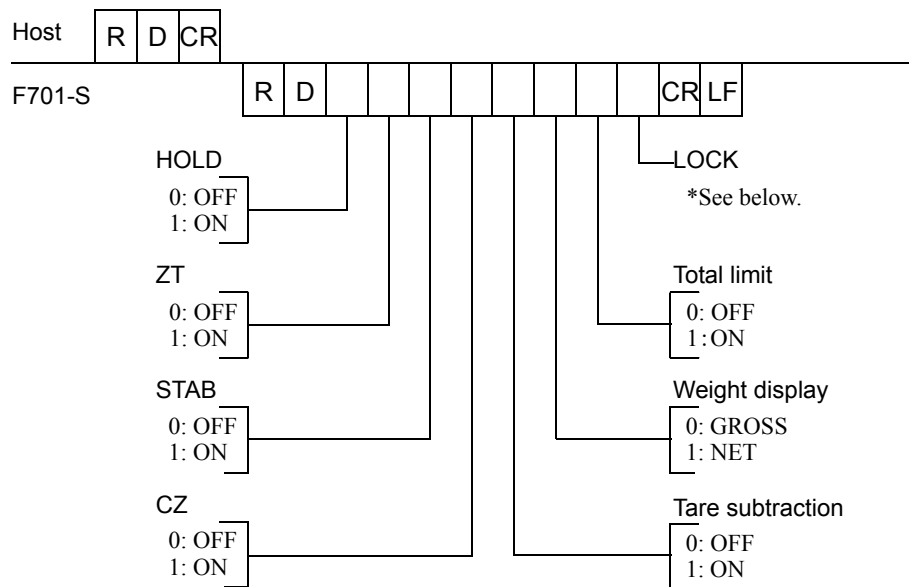


- Read the tare (sign, 5-digit weight, decimal point)



* Without the decimal point, put the decimal point in after the 5-digit number (before the CR).

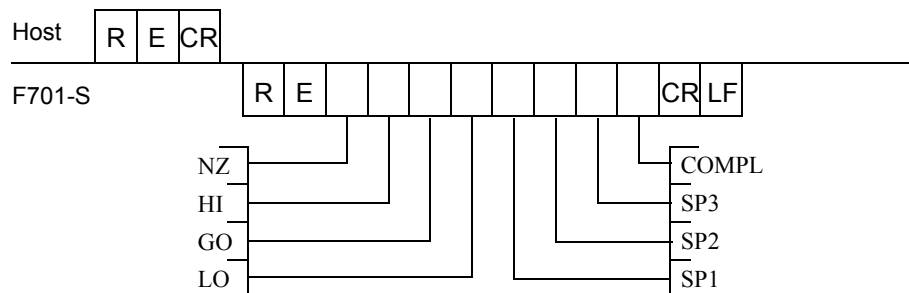
- Read status 1 (8-digit)



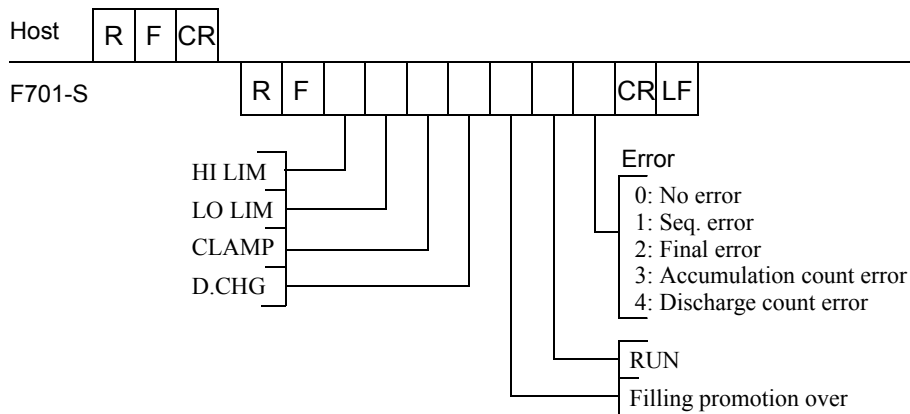
* LOCK

- 0: LOCK (SW), Lock1 (soft), and Lock2 (soft) are all OFF.
 1: Only LOCK (SW) is ON.
 2: Only Lock1 (soft) is ON.
 3: Only Lock2 (soft) is ON.
 4: LOCK (SW) and Lock1 (soft) are both ON.
 5: LOCK (SW) and Lock2 (soft) are both ON.
 6: Lock1 (soft) and Lock2 (soft) are both ON.
 7: LOCK (SW), Lock1 (soft), and Lock2 (soft) are all ON.

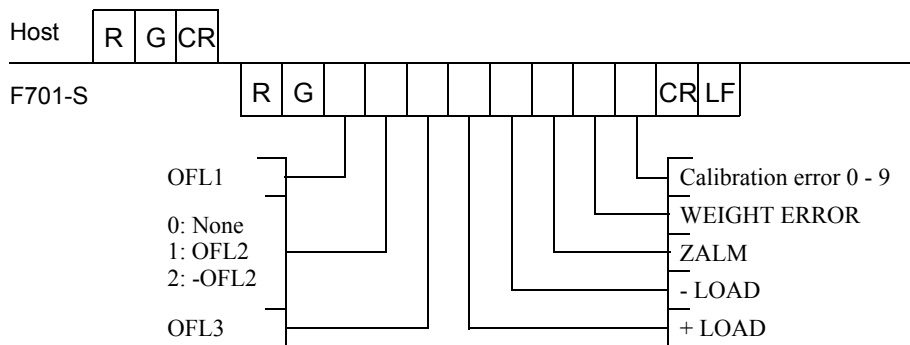
- Read status 2 (8-digit)



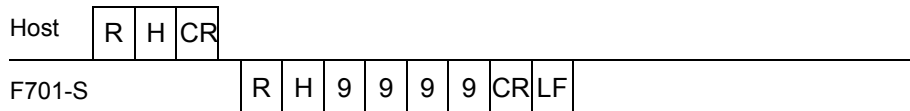
- Read status 3 (7-digit)



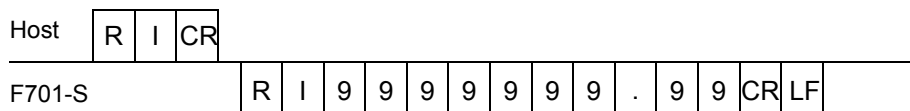
- Read status 4 (8-digit)



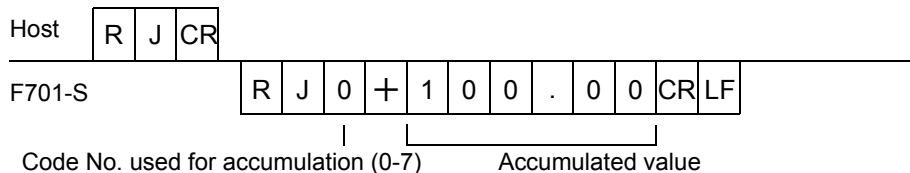
- Read the accumulation count (4-digit count)



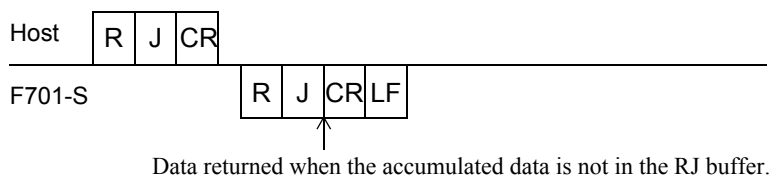
- Read the accumulation value (9-digit accumulation, decimal point)



- Read the accumulation data (code, 5-digit weight, decimal point)



* Up to 256 data can be stored in the buffer (RJ buffer) in memory, and clears data in the order of their occurrence from reading data.



Attention

Zero calibration/span calibration
Before sending this command, set the capacity, min scale division, balance weight value, etc.

- Display switching; gross weight

Host

C	C	CR
---	---	----

F701-S * No data returned

- Display switching; net weight

Host

C	D	CR
---	---	----

F701-S * No data returned

- One-touch tare subtraction

Host

C	E	CR
---	---	----

F701-S * No data returned

- One-touch tare subtraction reset

Host

C	F	CR
---	---	----

F701-S * No data returned

- Digital zero

Host

C	G	CR
---	---	----

F701-S * No data returned

- Digital zero reset

Host

C	H	CR
---	---	----

F701-S * No data returned

- Hold ON

Host

C	I	CR
---	---	----

F701-S * No data returned

- Hold OFF

Host	C	J	CR
------	---	---	----

F701-S * No data returned
- Accumulation clear

Host	C	K	CR
------	---	---	----

F701-S * No data returned

* Accumulation data on the selected weighing code are cleared.

* The RJ buffer (storing data for the RJ command) is also cleared.

- Accumulation data all clear (clearing eight codes of accumulation data)

Host	C	L	CR
------	---	---	----

F701-S * No data returned

* The RJ buffer (storing data for the RJ command) is also cleared.

- Accumulation command

Host	C	M	CR
------	---	---	----

F701-S * No data returned
- Allow operate ON

Host	C	N	1	CR
------	---	---	---	----

F701-S * No data returned
- Allow operate OFF

Host	C	N	2	CR
------	---	---	---	----

F701-S * No data returned
- Weighing start ON

Host	C	N	3	CR
------	---	---	---	----

F701-S * No data returned
- Weighing start OFF

Host	C	N	4	CR
------	---	---	---	----

F701-S * No data returned

- Stop ON

Host	C	N	5	CR
------	---	---	---	----

F701-S * No data returned

- Stop OFF

Host	C	N	6	CR
------	---	---	---	----

F701-S * No data returned

- Discharging command

Host	C	N	7	CR
------	---	---	---	----

F701-S * No data returned

- Manually discharge

Host	C	N	8	CR
------	---	---	---	----

F701-S * No data returned

- Open discharge gate ON

Host	C	N	9	CR
------	---	---	---	----

F701-S * No data returned

- Open discharge gate OFF

Host	C	N	A	CR
------	---	---	---	----

F701-S * No data returned

- Close discharge gate ON

Host	C	N	B	CR
------	---	---	---	----

F701-S * No data returned

- Close discharge gate OFF

Host	C	N	C	CR
------	---	---	---	----

F701-S * No data returned

1-4. Setting value communication formats

These are used for reading and writing setting values.

* For reading and writing setting values for each code, make sure to pre-designate each setting code.

Setting code

W	0	0	0	0	0	0	0	C	R	L	F
---	---	---	---	---	---	---	---	---	---	---	---

Weighing code

W	1	0	0	0	0	0	0	C	R	L	F
---	---	---	---	---	---	---	---	---	---	---	---

Upper limit

W	0	1						C	R	L	F
---	---	---	--	--	--	--	--	---	---	---	---

(write-inhibited when LOCK1 (soft) is applied)

Lower limit

W	0	2						C	R	L	F
---	---	---	--	--	--	--	--	---	---	---	---

(write-inhibited when LOCK1 (soft) is applied)

Near zero

W	0	3						C	R	L	F
---	---	---	--	--	--	--	--	---	---	---	---

(write-inhibited when LOCK1 (soft) is applied)

Set point 1

W	0	4						C	R	L	F
---	---	---	--	--	--	--	--	---	---	---	---

(write-inhibited when LOCK1 (soft) is applied) (for each code)

Set point 2

W	0	5						C	R	L	F
---	---	---	--	--	--	--	--	---	---	---	---

(write-inhibited when LOCK1 (soft) is applied) (for each code)

Compensation

W	0	6	0					C	R	L	F
---	---	---	---	--	--	--	--	---	---	---	---

(write-inhibited when LOCK1 (soft) is applied) (for each code)

Over

W	0	7	0					C	R	L	F
---	---	---	---	--	--	--	--	---	---	---	---

(write-inhibited when LOCK1 (soft) is applied) (for each code)

Under

W	0	8	0					C	R	L	F
---	---	---	---	--	--	--	--	---	---	---	---

(write-inhibited when LOCK1 (soft) is applied) (for each code)

Final

W	0	9						C	R	L	F
---	---	---	--	--	--	--	--	---	---	---	---

(write-inhibited when LOCK1 (soft) is applied) (for each code)

Comparison inhibit time

W	1	1	0	0				C	R	L	F
---	---	---	---	---	--	--	--	---	---	---	---

(write-inhibited when LOCK2 (soft) is applied)

Judging time

W	1	2	0	0	0			C	R	L	F
---	---	---	---	---	---	--	--	---	---	---	---

(write-inhibited when LOCK2 (soft) is applied)

Complete output time

W	1	3	0	0	0			C	R	L	F
---	---	---	---	---	---	--	--	---	---	---	---

(write-inhibited when LOCK2 (soft) is applied)

Compensation feeding time

W	1	4	0	0				C	R	L	F
---	---	---	---	---	--	--	--	---	---	---	---

(write-inhibited when LOCK1 (soft) is applied) (for each code)

Auto free fall compensation regulation

W	1	5						C	R	L	F
---	---	---	--	--	--	--	--	---	---	---	---

(write-inhibited when LOCK1 (soft) is applied) (for each code)

Weighing function 1

W	1	6	0					C	R	L	F
---	---	---	---	--	--	--	--	---	---	---	---

(write-inhibited when LOCK2 (soft) is applied)

Weighing function 2

W	1	7						C	R	L	F
---	---	---	--	--	--	--	--	---	---	---	---

(write-inhibited when LOCK2 (soft) is applied)

Tare setting

W	1	8						C	R	L	F
---	---	---	--	--	--	--	--	---	---	---	---

(write-inhibited when LOCK1 (soft) is applied)

Digital low pass filter

W	2	1	0	0	0	0		C	R	L	F
---	---	---	---	---	---	---	--	---	---	---	---

(write-inhibited when LOCK2 (soft) is applied)

Moving average filter

W	2	2	0	0				C	R	L	F
---	---	---	---	---	--	--	--	---	---	---	---

(write-inhibited when LOCK2 (soft) is applied)

Motion detection (period - range)

W	2	3			0			C	R	L	F
---	---	---	--	--	---	--	--	---	---	---	---

(write-inhibited when LOCK2 (soft) and LOCK (SW) are applied)

Zero tracking (period)

W	2	4	0	0	0			C	R	L	F
---	---	---	---	---	---	--	--	---	---	---	---

(write-inhibited when LOCK2 (soft) and LOCK (SW) are applied)

Zero tracking (range)

W	2	5	0					C	R	L	F
---	---	---	---	--	--	--	--	---	---	---	---

(write-inhibited when LOCK2 (soft) and LOCK (SW) are applied)

Total comparison selection

W	2	6	0	0	0	0		C	R	L	F
---	---	---	---	---	---	---	--	---	---	---	---

(write-inhibited when LOCK1 (soft) is applied) (for each code)

Total limit (high 4)

W	2	7	0					C	R	L	F
---	---	---	---	--	--	--	--	---	---	---	---

(write-inhibited when LOCK1 (soft) is applied) (for each code)

Total limit (under 5)

W	2	8						C	R	L	F
---	---	---	--	--	--	--	--	---	---	---	---

(write-inhibited when LOCK1 (soft) is applied) (for each code)

Count limit

W	2	9	0					C	R	L	F
---	---	---	---	--	--	--	--	---	---	---	---

(write-inhibited when LOCK1 (soft) is applied) (for each code)

Setting value No. Setting value up to 5 digits

* Values other than "0" should not put in places where "0" is set.

Weighing function 3	<table><tr><td>W</td><td>3</td><td>1</td><td>0</td><td>0</td><td></td><td></td><td></td><td></td><td></td><td>CR</td><td>LF</td></tr></table>	W	3	1	0	0						CR	LF	(write-inhibited when LOCK2 (soft) is applied)
W	3	1	0	0						CR	LF			
Key invalid•LOCK	<table><tr><td>W</td><td>3</td><td>2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>CR</td><td>LF</td></tr></table>	W	3	2								CR	LF	
W	3	2								CR	LF			
Input selection 1	<table><tr><td>W</td><td>3</td><td>3</td><td>0</td><td></td><td></td><td></td><td></td><td></td><td></td><td>CR</td><td>LF</td></tr></table>	W	3	3	0							CR	LF	(write-inhibited when LOCK2 (soft) is applied)
W	3	3	0							CR	LF			
Input selection 2	<table><tr><td>W</td><td>3</td><td>4</td><td>0</td><td>0</td><td>0</td><td></td><td></td><td></td><td></td><td>CR</td><td>LF</td></tr></table>	W	3	4	0	0	0					CR	LF	(write-inhibited when LOCK2 (soft) is applied)
W	3	4	0	0	0					CR	LF			
Output selection 1	<table><tr><td>W</td><td>3</td><td>5</td><td>0</td><td></td><td></td><td></td><td></td><td></td><td></td><td>CR</td><td>LF</td></tr></table>	W	3	5	0							CR	LF	(write-inhibited when LOCK2 (soft) is applied)
W	3	5	0							CR	LF			
Output selection 2	<table><tr><td>W</td><td>3</td><td>6</td><td>0</td><td>0</td><td>0</td><td></td><td></td><td></td><td></td><td>CR</td><td>LF</td></tr></table>	W	3	6	0	0	0					CR	LF	(write-inhibited when LOCK2 (soft) is applied)
W	3	6	0	0	0					CR	LF			
Error output selection	<table><tr><td>W</td><td>3</td><td>7</td><td>0</td><td>0</td><td>0</td><td></td><td></td><td></td><td></td><td>CR</td><td>LF</td></tr></table>	W	3	7	0	0	0					CR	LF	(write-inhibited when LOCK2 (soft) is applied)
W	3	7	0	0	0					CR	LF			
Reserve output selection	<table><tr><td>W</td><td>3</td><td>8</td><td></td><td></td><td>0</td><td></td><td></td><td></td><td></td><td>CR</td><td>LF</td></tr></table>	W	3	8			0					CR	LF	(write-inhibited when LOCK2 (soft) is applied)
W	3	8			0					CR	LF			
Bag clamp output time	<table><tr><td>W</td><td>4</td><td>1</td><td>0</td><td>0</td><td>0</td><td></td><td></td><td></td><td></td><td>CR</td><td>LF</td></tr></table>	W	4	1	0	0	0					CR	LF	(write-inhibited when LOCK2 (soft) is applied)
W	4	1	0	0	0					CR	LF			
Discharging time	<table><tr><td>W</td><td>4</td><td>2</td><td>0</td><td>0</td><td>0</td><td></td><td></td><td></td><td></td><td>CR</td><td>LF</td></tr></table>	W	4	2	0	0	0					CR	LF	(write-inhibited when LOCK2 (soft) is applied)
W	4	2	0	0	0					CR	LF			
Weighing start time	<table><tr><td>W</td><td>4</td><td>3</td><td>0</td><td>0</td><td>0</td><td></td><td></td><td></td><td></td><td>CR</td><td>LF</td></tr></table>	W	4	3	0	0	0					CR	LF	(write-inhibited when LOCK2 (soft) is applied)
W	4	3	0	0	0					CR	LF			
AZ times	<table><tr><td>W</td><td>4</td><td>4</td><td>0</td><td>0</td><td>0</td><td></td><td></td><td></td><td></td><td>CR</td><td>LF</td></tr></table>	W	4	4	0	0	0					CR	LF	(write-inhibited when LOCK2 (soft) is applied)
W	4	4	0	0	0					CR	LF			
Judging times	<table><tr><td>W</td><td>4</td><td>5</td><td>0</td><td>0</td><td>0</td><td></td><td></td><td></td><td></td><td>CR</td><td>LF</td></tr></table>	W	4	5	0	0	0					CR	LF	(write-inhibited when LOCK2 (soft) is applied)
W	4	5	0	0	0					CR	LF			
Sequence mode 1	<table><tr><td>W</td><td>4</td><td>6</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>CR</td><td>LF</td></tr></table>	W	4	6								CR	LF	(write-inhibited when LOCK2 (soft) is applied)
W	4	6								CR	LF			
Sequence mode 2	<table><tr><td>W</td><td>4</td><td>7</td><td>0</td><td>0</td><td></td><td></td><td></td><td></td><td></td><td>CR</td><td>LF</td></tr></table>	W	4	7	0	0						CR	LF	(write-inhibited when LOCK2 (soft) is applied)
W	4	7	0	0						CR	LF			
Filling promotion weight	<table><tr><td>W</td><td>4</td><td>8</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>CR</td><td>LF</td></tr></table>	W	4	8								CR	LF	(write-inhibited when LOCK2 (soft) is applied)
W	4	8								CR	LF			
Extended function selection 1	<table><tr><td>W</td><td>5</td><td>1</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>CR</td><td>LF</td></tr></table>	W	5	1								CR	LF	(write-inhibited when LOCK2 (soft) and LOCK (SW) are applied)
W	5	1								CR	LF			
Extended function selection 2	<table><tr><td>W</td><td>5</td><td>2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>CR</td><td>LF</td></tr></table>	W	5	2								CR	LF	(write-inhibited when LOCK2 (soft) and LOCK (SW) are applied)
W	5	2								CR	LF			
Balance weight value	<table><tr><td>W</td><td>6</td><td>1</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>CR</td><td>LF</td></tr></table>	W	6	1								CR	LF	(write-inhibited when LOCK2 (soft) and LOCK (SW) are applied)
W	6	1								CR	LF			
Capacity	<table><tr><td>W</td><td>6</td><td>2</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>CR</td><td>LF</td></tr></table>	W	6	2								CR	LF	(write-inhibited when LOCK2 (soft) and LOCK (SW) are applied)
W	6	2								CR	LF			
Min scale division	<table><tr><td>W</td><td>6</td><td>3</td><td>0</td><td>0</td><td>0</td><td></td><td></td><td></td><td></td><td>CR</td><td>LF</td></tr></table>	W	6	3	0	0	0					CR	LF	(write-inhibited when LOCK2 (soft) and LOCK (SW) are applied)
W	6	3	0	0	0					CR	LF			
DZ regulation value	<table><tr><td>W</td><td>6</td><td>4</td><td>0</td><td></td><td></td><td></td><td></td><td></td><td></td><td>CR</td><td>LF</td></tr></table>	W	6	4	0							CR	LF	(write-inhibited when LOCK2 (soft) and LOCK (SW) are applied)
W	6	4	0							CR	LF			
Display selection 1	<table><tr><td>W</td><td>6</td><td>5</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>CR</td><td>LF</td></tr></table>	W	6	5								CR	LF	(write-inhibited when LOCK2 (soft) and LOCK (SW) are applied)
W	6	5								CR	LF			
Gravitational acceleration	<table><tr><td>W</td><td>6</td><td>6</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>CR</td><td>LF</td></tr></table>	W	6	6								CR	LF	(write-inhibited when LOCK2 (soft) and LOCK (SW) are applied)
W	6	6								CR	LF			
Net over	<table><tr><td>W</td><td>6</td><td>7</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>CR</td><td>LF</td></tr></table>	W	6	7								CR	LF	(write-inhibited when LOCK2 (soft) is applied)
W	6	7								CR	LF			
Gross over	<table><tr><td>W</td><td>6</td><td>8</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>CR</td><td>LF</td></tr></table>	W	6	8								CR	LF	(write-inhibited when LOCK2 (soft) is applied)
W	6	8								CR	LF			
Display selection 2	<table><tr><td>W</td><td>6</td><td>9</td><td>0</td><td>0</td><td>0</td><td>0</td><td></td><td></td><td></td><td>CR</td><td>LF</td></tr></table>	W	6	9	0	0	0	0				CR	LF	(write-inhibited when LOCK2 (soft) and LOCK (SW) are applied)
W	6	9	0	0	0	0				CR	LF			
<div><div></div><div></div></div>														
Setting value No.	Setting value up to 5 digits													

* Values other than "0" should not put in places where "0" is set.

(write-inhibited when LOCK2 (soft) and LOCK (SW) are applied)

(write-inhibited when LOCK2 (soft) is applied)

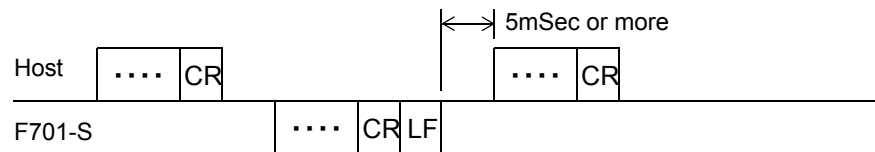
(write-inhibited when LOCK2 (soft) is applied)

(write-inhibited when LOCK2 (soft) is applied)

(write-inhibited when LOCK2 (soft) is applied)

* Values other than "0" should not put in places where "0" is set.

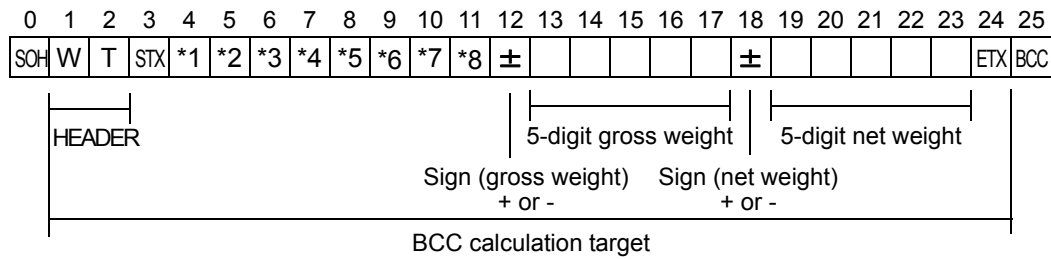
After receiving a response from the F701-S, keep an interval of 5mSec or more until sending the next command from the host.



Sign | |
+ or - 5-digit gross weight + decimal point

Sign |
+ or - 5-digit net weight + decimal point

- Transmission format 3



Each ASCII code of SOH, STX, and ETX

SOH: 01
STX: 02
ETX: 03

BCC calculation method

Each code targeted for BCC calculation is expressed in hexadecimal notation, and the result of XOR with all data enters BCC.

*1 O : Overload (LOAD, OFL)
S : Stable
M : Unstable
H : Hold

Order of priority: H > O > (S or M)

*2 A : Zero tracking OFF
T : Zero tracking ON
Z : Zero alarm (ZALM)

Order of priority: Z > (A or T)

*3 H : Upper limit ON
L : Lower limit ON
G : Upper limit and lower limit OFF
N : Upper limit and lower limit ON
F : Comparison OFF

Order of priority: N, F > (H or L) > G

*4 H : Over ON
L : Under ON
G : Over and under OFF
F : Comparison OFF

Order of priority: (H or L), F > G

*5 0 : SP1, SP2, SP3, complete OFF
1 : SP1 ON
2 : SP2 ON
3 : SP3 ON
C : Complete ON

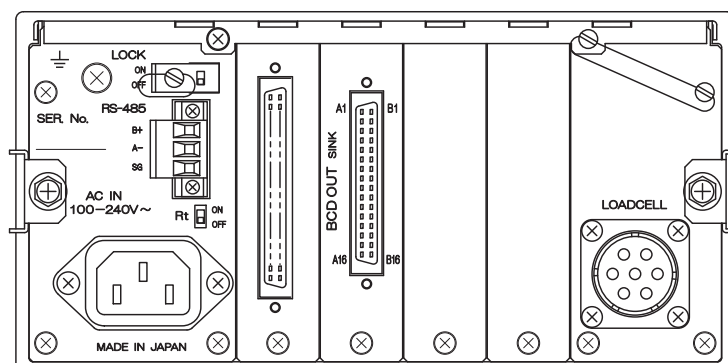
Order of priority: C > 3 > 2 > 1 > 0

*6 N : Near zero OFF
Z : Near zero ON

*7 Unit display
0 : None 3 : kg
1 : t 4 : lb
2 : g

*8 Decimal place
0 : None
1 : 0.0
2 : 0.00
3 : 0.000

There is a need to prepare an external DC 24V power supply.



2-1. Specifications

Output signal:	Weight data (5-digit), MINUS, OVER, P.C, STROBE	
Output logic:	Positive logic/negative logic switchable	
Output circuit:	Photocoupler isolated open-collector output (current sink type)	
	Rated input voltage	DC24V
	Operating voltage range	DC20.4 to 26.4V (ripple percent within 5%)
	Max. voltage	DC30V
	Max. current	DC120mA
Input signal:	Logic switch, hold, output data selection	
Input circuit:	Can be connected to contact or sink type output circuit.	
	Rated input voltage	DC24V
	Operating voltage range	DC20.4 to 26.4V (ripple percent within 5%)
	Load current	Approx. 11mA (when 24V DC load)

2-2. BCD parallel data output interface related setting values

■BCD data update rate (setting mode 8-1)

Set the BCD data update rate of this device.

BCD data updata rate



0: 300 times/sec. 4: 10 times/sec.
1: 100 times/sec. 5: 5 times/sec.
2: 50 times/sec. 6: 3 times/sec.
3: 30 times/sec. 7: 1 times/sec.

Correlations between BCD data update rate and STROBE range are as follows.

	BCD data updata rate	STROBE range
7	1 times/sec.	Approx. 500 msec
6	3 times/sec.	Approx. 170 msec
5	5 times/sec.	Approx. 100 msec
4	10 times/sec.	Approx. 50 msec
3	30 times/sec.	Approx. 17 msec
2	50 times/sec.	Approx. 10 msec
1	100 times/sec.	Approx. 5 msec
0	300 times/sec.	Approx. 1.7 msec

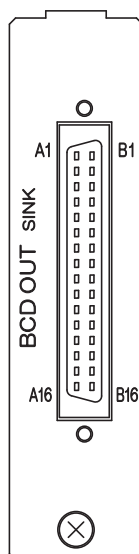
The data update rate is normally 300 times/sec., which is the same as the operating speed of the main unit, but data may not be read with some connected external devices because the speed is too fast. In such a case, set the data update rate longer (reduce the number of time).

2-3. Connector pin assignments

The adaptable connector is FUJITSU COMPONENT-manufactured.

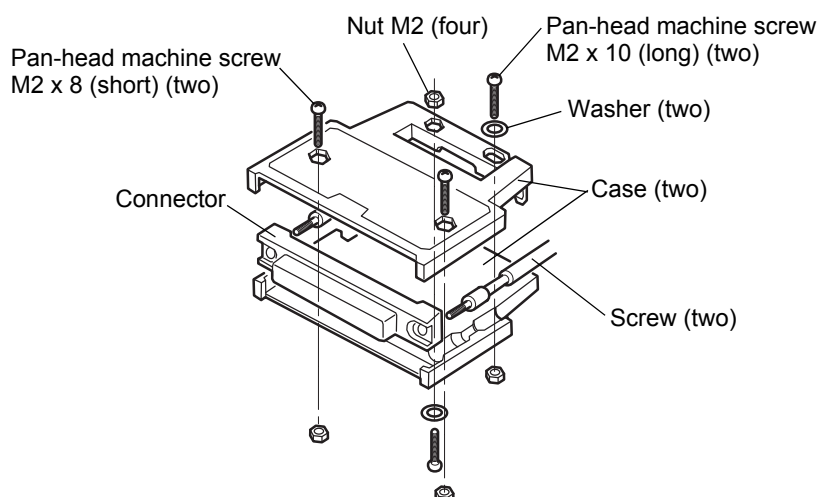
connector: FCN-361J032-AU / cover: FCN-360C032-B

Equivalent are adaptable.



A1	*	DC24V-	B1	*	DC24V-
A2	out	1	B2	out	1000
A3	out	2	B3	out	2000
A4	out	4	B4	out	4000
A5	out	8	B5	out	8000
A6	out	10	B6	out	10000
A7	out	20	B7	out	20000
A8	out	40	B8	out	40000
A9	out	80	B9	out	80000
A10	out	100	B10	out	MINUS
A11	out	200	B11	out	OVER
A12	out	400	B12	out	P.C
A13	out	800	B13	out	STROBE
A14	in	Hold	B14	in	Logic switch
A15	in	Output data selection 1	B15	in	Output data selection 2
A16	*	DC24V+	B16	*	DC24V+

■ How to assemble the connector



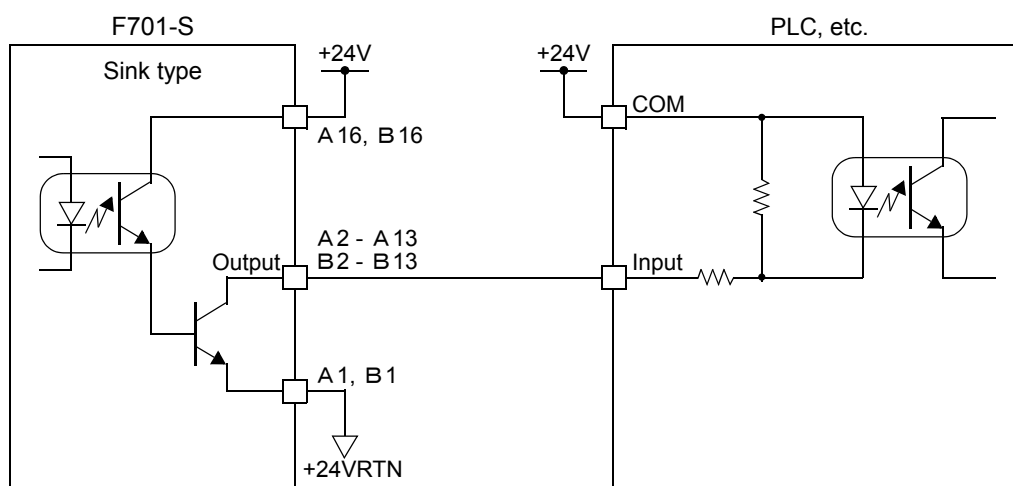
1. Set the connector and screws (two) into the grooves of the case (one side).
2. Cover with the other case, and fit the cases.
3. Tighten the M2 x 8 pan-head machine screws (two).
Tighten the M2 x 10 pan-head machine screws (two).
Be aware that washers should be set to the M2 x 10 pan-head machine screws (two).

2-4. Equivalent circuit and example connection

There is a need to prepare an external DC24V power supply.

- Output

The signal output circuit is photocoupler isolated open-collector output (current sink type).



- Status of internal transistor

Output data	Negative	Positive
0	OFF	ON
1	ON	OFF

Pin B14: Logic switch

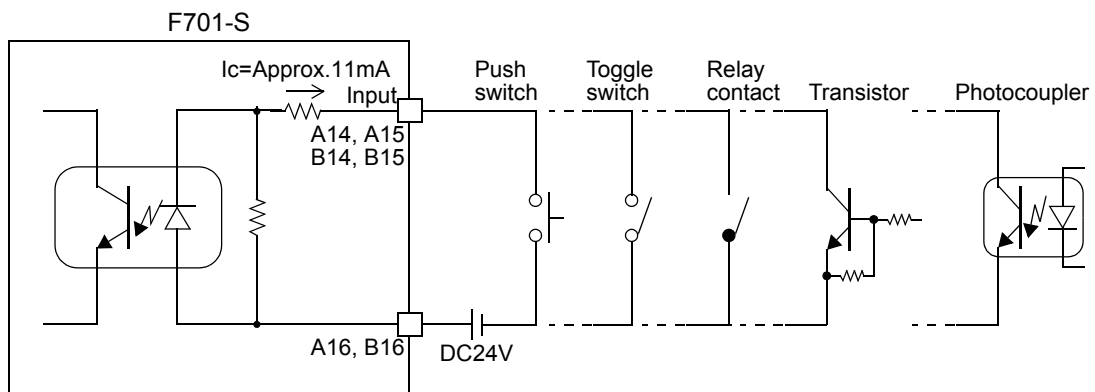
- Output pin level

Output data	Negative	Positive
0	H	L
1	L	H

- Input

Switch, relay, transistor and photocoupler, etc. can be connected.

To connect the transistor and photocoupler, etc., connect unit of sink type.



2-5. BCD data output

The weighing values are outputted in 5-digit. Also, each digit is outputted with a 4-bit data of 0 or 1.

Digit data	8	4	2	1
0	0	0	0	0
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
8	1	0	0	0
9	1	0	0	1

2-6. Polarity output (MINUS)

The output polarity of weighing values by BCD are "0" for plus and "1" for minus.

2-7. Over status output (OVER)

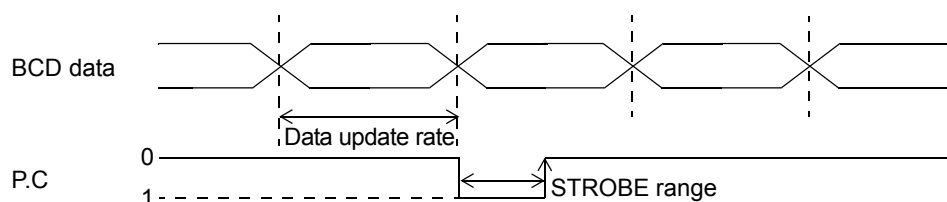
When the output of weighing values by BCD is under the conditions below, 1 (over) is outputted.

Weighing value	Conditional expression	Display
Net weight	Net weight > Net over setting value	oFL1
Gross weight	Gross weight > Gross over setting value	oFL3
Tare	Tare > 99999	

2-8. Print command output (P.C)

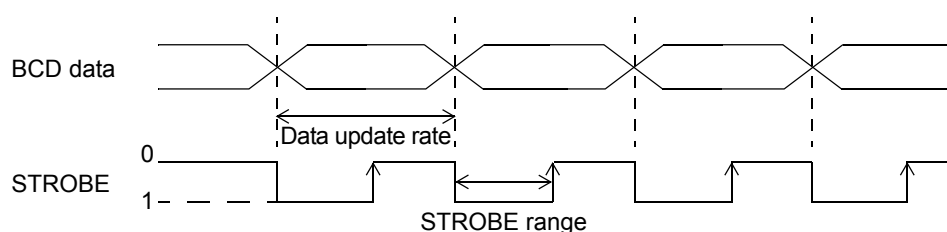
Use the end edge of a pulse to read the data.

It is output in synchronization with the complete signal when judgment is made on Over/Under comparison.



2-9. Data strobe (STROBE)

The BCD data is updated by each A/D conversion and a strobe pulse is outputted in synchronization with BCD data. Use the end edge of a pulse to read the data.



2-10. Hold input

The BCD data output signal is held. (No strobe pulse is outputted during Hold.)

2-11. Logic switch input

Switch the output logic. Open: negative. Short: positive.

2-12. Output data selection input

Select the output weighing value by BCD code.

Selection 1	Selection 2	Weighing value
Open	Open	Follow F701-S display
Open	Short	Net weight
Short	Short	Gross weight
Short	Open	Tare

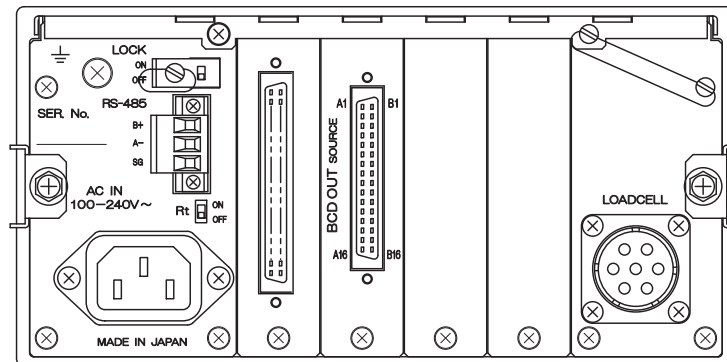
3. BCD PARALLEL DATA OUTPUT INTERFACE (SOURCE TYPE) [BSC]

It is an interface for taking out weighing values as BCD (binary coded decimal) data. It is convenient for processing, such as control, accumulation and recording, when connected with a computer, process controller, PLC, etc..

The input/output circuits and internal circuitry are electrically photo-coupler-isolated.

The interface of the output circuit current source type.

There is a need to prepare an external DC 24V power supply.



3-1. Specifications

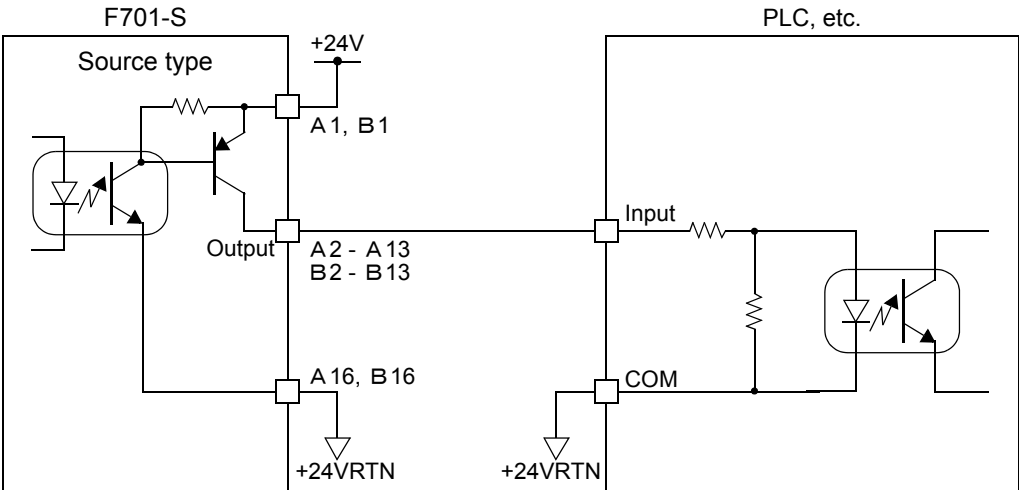
Output signal:	Weight data (5-digit), MINUS, OVER, P.C, STROBE
Output logic:	Positive logic/negative logic switchable
Output circuit:	Photocoupler isolated output (current source type)
	Rated input voltage DC24V
	Operating voltage range DC20.4 to 26.4V (ripple percent within 5%)
	Max. voltage DC30V
	Max. current DC120mA
Input signal:	Logic switch, hold, output data selection
Input circuit:	Can be connected to contact or source type output circuit.
	Rated input voltage DC24V
	Operating voltage range DC20.4 to 26.4V (ripple percent within 5%)
	Load current Approx. 11mA (when 24V DC load)

3-4. Equivalent circuit and example connection

There is a need to prepare an external DC24V power supply.

- Output

The signal output circuit is photocoupler isolated output (current source type).



- Status of internal transistor

Output data	Negative	Positive
0	OFF	ON
1	ON	OFF

- Output pin level

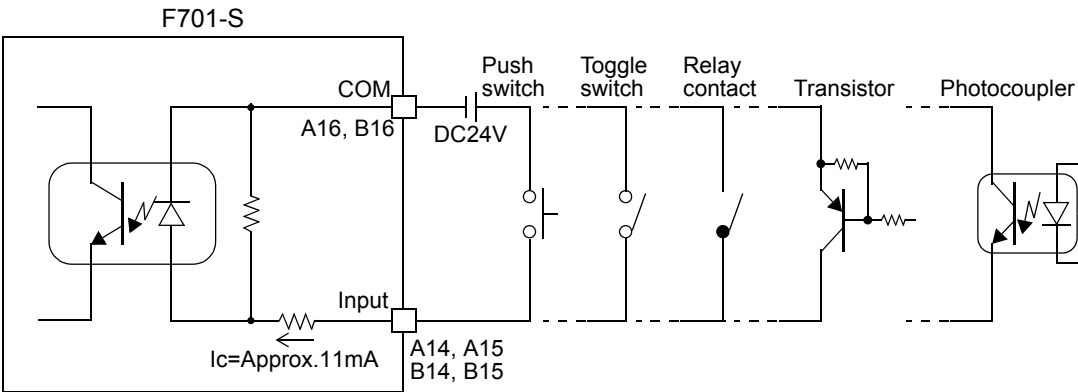
Output data	Negative	Positive
0	H	L
1	L	H

Pin B14: Logic switch

- Input

Switch, relay, transistor and photocoupler, etc. can be connected.

To connect the transistor and photocoupler, etc., connect unit of source type.



3-5. BCD data output

The weighing values are outputted in 5-digit. Also, each digit is outputted with a 4-bit data of 0 or 1.

Digit data	8	4	2	1
0	0	0	0	0
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
8	1	0	0	0
9	1	0	0	1

3-6. Polarity output (MINUS)

The output polarity of weighing values by BCD are "0" for plus and "1" for minus.

3-7. Over status output (OVER)

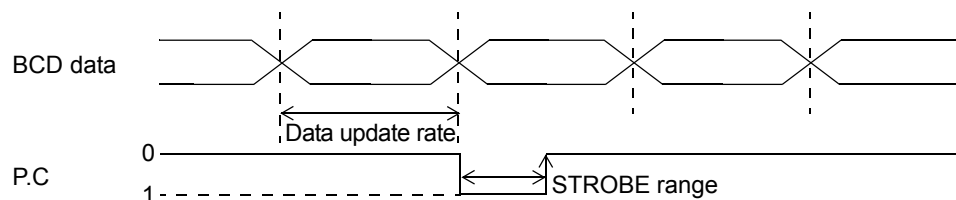
When the output of weighing values by BCD is under the conditions below, 1 (over) is outputted.

Weighing value	Conditional expression	Display
Net weight	Net weight > Net over setting value	oFL1
Gross weight	Gross weight > Gross over setting value	oFL3
Tare	Tare > 99999	

3-8. Print command output (P.C)

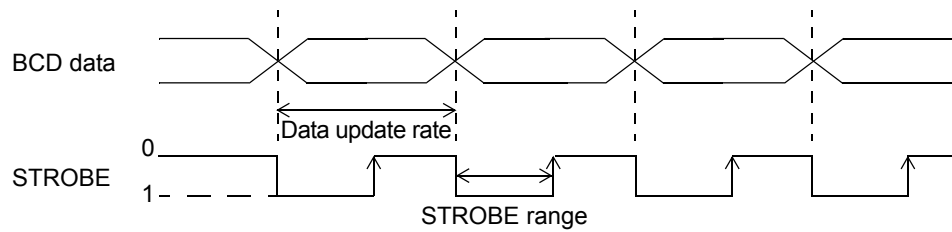
Use the end edge of a pulse to read the data.

It is output in synchronization with the complete signal when judgment is made on Over/Under comparison.



3-9. Data strobe (STROBE)

The BCD data is updated by each A/D conversion and a strobe pulse is outputted in synchronization with BCD data. Use the end edge of a pulse to read the data.



3-10. Hold input

The BCD data output signal is held. (No strobe pulse is outputted during Hold.)

3-11. Logic switch input

Switch the output logic. Open: negative. Short: positive.

3-12. Output data selection input

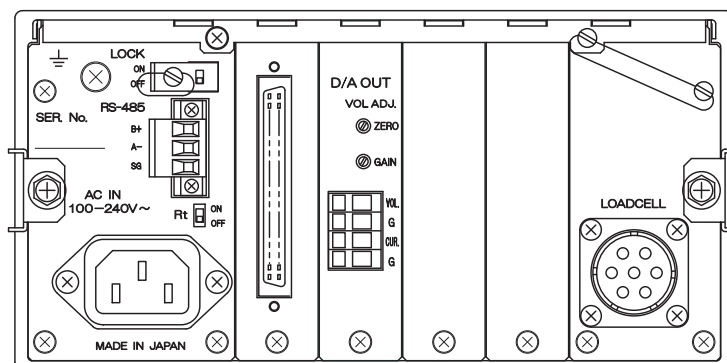
Select the output weighing value by BCD code.

Selection 1	Selection 2	Weight value
Open	Open	Follow F701-S display
Open	Short	Net weight
Short	Short	Gross weight
Short	Open	Tare

4. D/A CONVERTER INTERFACE [DAC]

The converter to obtain voltage/current value linked to weight the data of F701-S.
It can set the zero output weight value and full scale weight value.

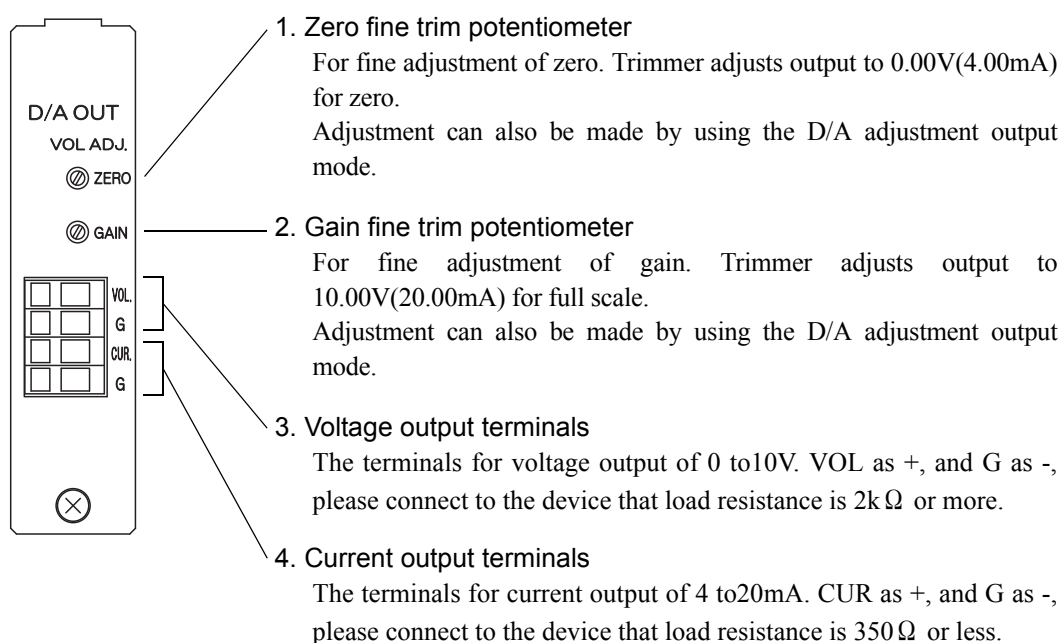
* The voltage output and current output can use simultaneously.



4-1. Specifications

Voltage output:	0 to 10V
Current output:	4 to 20mA
Conversion rate:	300 times/sec.
Resolution:	1/10000
Over range:	10% of the full scale
	Voltage -1.0 to 11.0V
	Current 2.4 to 21.6mA

4-2. Name of each part



**Point**

The trimmer is for fine adjustment.

Temperature drift may increase if you have severely changed the value that had been set when you first received the product.

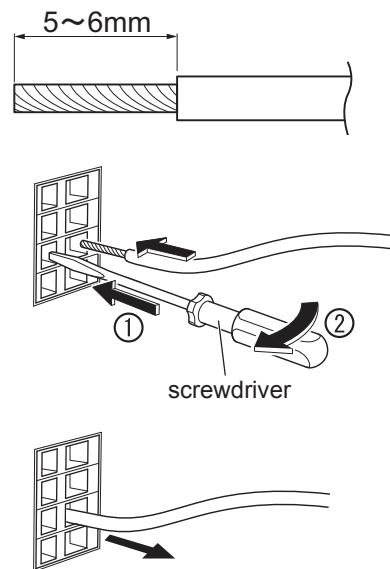
4-3. Connection of the voltage/current output terminals

Voltage/current output terminal stand are the cage clamping types.

As wiring materials, use shielded cables. Also, please do not be parallel with the AC line or high voltage line.

Connect to the cage clamp type terminal block by using the attached mini screwdriver.

1. Strip the casing 0.2in (6mm) on the cable to be connected. Twist the bare wire to fit the terminal hole.
2. Insert the supplied screwdriver into the left hole and lift left.
3. Insert the twisted wires into the right hole.
4. Pull the screwdriver out from the left hole.
5. Make sure cable is clamped securely and does not come out with a slight tug.

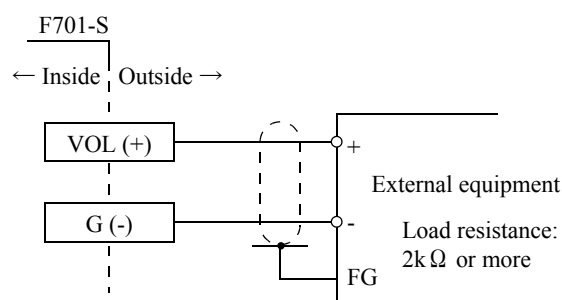
**Attention**

- Cable can be from 24 ~ 14AWG (0.2 ~ 2.5mm²).
- It is not necessary to solder the cable wires or to fix a solderless terminal.
- If several cables to be inserted to the same hole, twist those cable wires together and insert.

4-4. Taking output signals

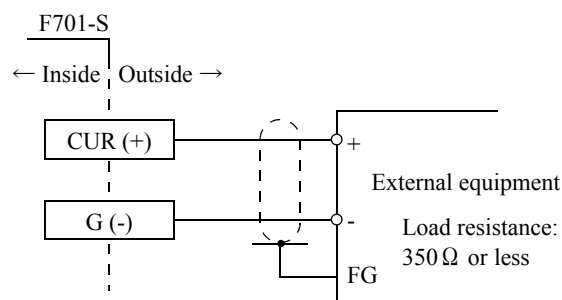
- Taking voltage output signals

Connect an external equipment
(load resistance $2\text{k}\Omega$ or more) between
VOL (+) ~ G (-) of the F701-S.



- Taking current output signals

Connect an external equipment
(load resistance 350Ω or less) between
CUR (+) ~ G (-) of the F701-S.



Attention

- Do not apply any external voltage or current because it causes some damage to D/A converter.
- If the capacity load is connected to the converter it may cause oscillation.

4-5. D/A converter interface related setting values

■ D/A zero output weight (setting mode 7-8)

Input range/0 - 99998

■ D/A full scale value (setting mode 7-9)

Input range/1 - 99999

- In the case of voltage output

Zero scale: Set the weight value for the time of output of 0V.
Full scale: Input the weight value to output 10V.

- In the case of current output

Zero scale: Set the weight value for the time of output of 4mA.
Full scale: Input the weight value to output 20mA.

D/A output mode (setting mode 7-7)

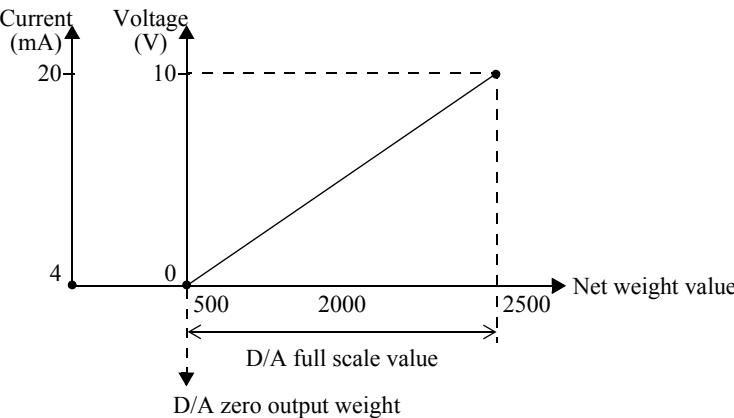
Select the output mode from
0: Tied to the gross weight value/ 1: Tied to the net weight value/ 2: Zero scale fix/ 3: Full scale fix.

- Tied to the gross weight value: Output in conjunction with the gross weight.
- Tied to the net weight value: Output in conjunction with the net weight.
- Zero scale fix: Output is fixed at zero output (0V or 4mA).
- Full scale fix: Output is fixed at full scale (10V or 20mA).

Relationship between each setting values

Example
D/A output mode: 1 (Tied to the net weight value)
D/A zero output weight: 500
D/A full scale value: 2000

* Make fine adjustment of zero and gain by using the zero and gain fine trim potentiometer.



Zero →		Net weight	Voltage (V)	Current (mA)
		480	-0.10	3.84
		500	0.00	4.00
		1000	2.50	8.00
		1500	5.00	12.00
		2500	10.00	20.00
Full scale →		2520	10.10	20.16

5. CC-Link INTERFACE [CCL]

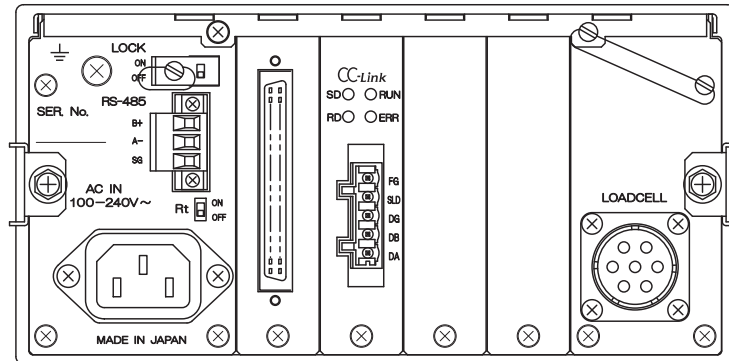
Introduction

The F701-S CC-Link I/F is described in the following.

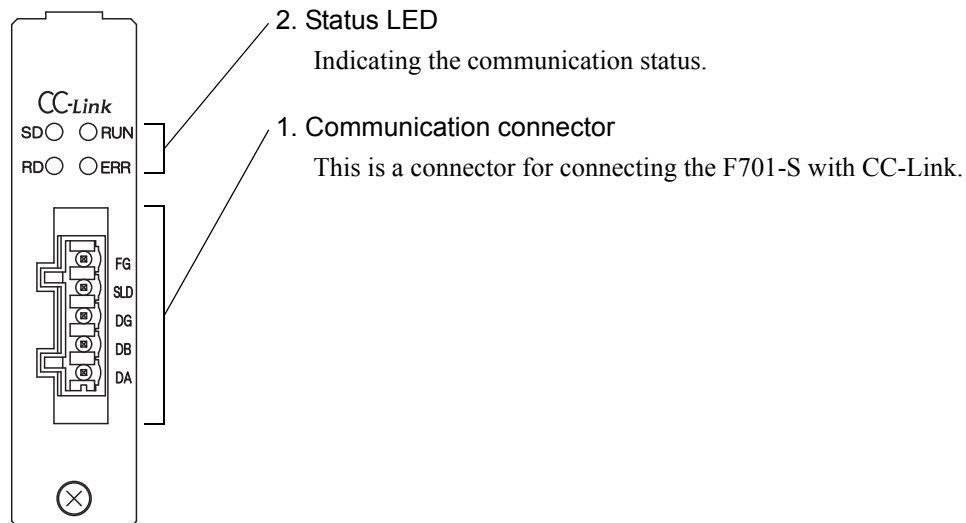
By using the CC-Link I/F, the F701-S can be controlled directly from the PLC, so that wiring can be substantially reduced.

Readers should have basic knowledge of the programming of the PLC and basic knowledge of the CC-Link I/F.

For basic knowledge of CC-Link I/F, see specialized references.



5-1. Name of each part

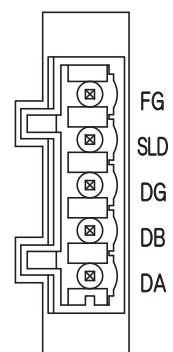


1. Communication connector

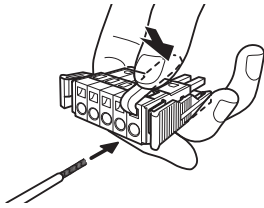
SLD and FG are connected inside.

Suitable plug for the connection is "721-105/037-000" (an accessory parts) made by WAGO CO., Ltd. or equivalent one.

Name	Signal type
FG	Frame ground
SLD	Shield
DG	Signal line ground
DB	Signal line DB side
DA	Signal line DA side



⚠ CAUTION



- Pinch the plug and operate the lever with a thumb.
- For protecting the CC-Link option from damage, do not operate the lever without removing the plug.

Attention

When the F701-S is a unit at end, termination resistance must be installed. (Confirm with the CC-Link specifications.) At this time, when the DA and DB signal lines and resistance are to be connected to the connector, be aware that poor contact may result if the nipping conditions differ between the leg of the resistance and signal lines. There is a possibility of abnormal operation.

2. Status LED

LED expresses the status of communication.

Name of LED	Light ON	Light OFF	Blinking
RUN	- Normal	- Reset action - No communication	— — — —
SD	- Transmitting	— — — —	— — — —
RD	- Receiving	— — — —	— — — —
ERR	- Setting error - CRC error - Fault	- Normal	— — — —

5-2. CC-Link interface related setting values

■ Baud rate (setting mode 8-2)

Determine transmission speed. (Initial value: 10M)

Select from 0: 156k/1: 625k/2: 2.5M/3: 5M/4: 10M.

■ Station number (setting mode 8-3)

Set slave station number. (Initial value: No.1)

(Input range/1 - 61)

■ Setting code selection (setting mode 8-2)

Selecting to designate the setting code of F701-S whether by relay or data.

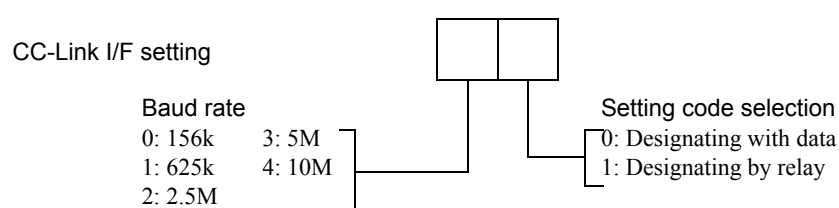
(Initial value: Designating with data)

Select from 0: Designating with data/1: Designating by relay.

Attention

Selecting to designate the weighing code of F701-S by relay only.

Please note that in the data can not be designated.



5-3. PLC address

F701-S is so occupied four stations per unit. When multiple units are connected to the station, configuration is as follows.

Be careful to do not overlap the assignment of station number.

The address of remote (F701-S) will be changed in accordance with the assignment of Station No..

Station No.	Remote input	Remote output	Remote resister	
			M→R	R→M
1	RX0000	RY0000	RWw0000	RWr0000
	00E0H	0160H	01E0H	02E0H
2	RX0020	RY0020	RWw0004	RWr0004
	00E2H	0162H	01E4H	02E4H
3	RX0040	RY0040	RWw0008	RWr0008
	00E4H	0164H	01E8H	02E8H
4	RX0060	RY0060	RWw000C	RWr000C
	00E6H	0166H	01ECH	02ECH
5	RX0080	RY0080	RWw0010	RWr0010
	00E8H	0168H	01F0H	02F0H

The first unit

The second unit

Therefore, the data of F701-S also will change the address by station number.

Following address map shows the status when station No. starts from 1.

5-4. Address map (data domain)

■ Remote resister M→R (PLC→F701-S)

Station	Buffer address	Device M→R	Content		
			MSB	LSB	
1	01E0H	RWw0000	Final		L
	01E1H	RWw0001	Code 8bit	24bit	H
	01E2H	RWw0002	Set point 1		L
	01E3H	RWw0003	32bit		H
2	01E4H	RWw0004	Set point 2 16bit		Exclusive data area
	01E5H	RWw0005	Compensation 16bit		
	01E6H	RWw0006	Over 16bit		
	01E7H	RWw0007	Under 16bit		
3	01E8H	RWw0008	Upper limit		L
	01E9H	RWw0009	32bit		H
	01EAH	RWw000A	Lower limit		L
	01EBH	RWw000B	32bit		H
4	01ECH	RWw000C	General purpose data area		L
	01EDH	RWw000D	32bit		H
	01EEH	RWw000E	Undefined 8bit	Command No. 8bit	
	01EFH	RWw000F	Undefined 16bit		

■ Explanation for remote resister M→R

◎ Exclusive data area

When resister Setting value using "Request flag 1", set each data in each area respectively.

* For resister setting values for each code, make sure to pre-designate each setting code.

- Final (24bit binary) (0 to 99999)

Set a Final value. For each code.

- Code (8bit binary) (0 to 7)

It is only valid when setting code is set "Internal" and "Designating with data".

- Set point 1 (32bit binary) (0 to 99999)

Set a Set point 1 value. For each code.

- Set point 2 (16bit binary) (0 to 65335)

Set a Set point 2 value. Range 65536 to 99999 is not available for Set point 2. For each code.

- Compensation (16bit binary) (0 to 9999)

Set a Compensation value. For each code.

When auto free fall compensation (setting mode 3-1) is set to "2: ON (Communication option OFF)", compensation can not be set from CC-Link.

- Over (16bit binary) (0 to 9999)

Set an Over value. For each code.

- Under (16bit binary) (0 to 9999)
Set an Under value. For each code.
- Upper limit (32bit binary) (0 to 99999)
Set an Upper limit value.
- Lower limit (32bit binary) (0 to 99999)
Set a Lower limit value.

◎General purpose data area (signed 32 bit binary) (-99999 to 99999)

Setting Command or Data to this area by Request flag 2.

When the most significant bit indicates "0" means Plus. When it indicates "1" means Minus.

Set "0" here because there is no Minus setting value under present condition.

◎Command No. (8bit binary) (0 to 255)

Set a Command number. Ignore upper byte.

When "0" is set, it changes to operation mode.

* When the value larger than the maximum setting range is set, it treat as the maximum value is set.

■Remote resister R→M (F701-S→PLC)

Station	Buffer address	Device R→M	Content		
			MSB	LSB	
1	02E0H	RWr0000	Net weight		L H
	02E1H	RWr0001			
	02E2H	RWr0002	Gross weight		L H
	02E3H	RWr0003			
2	02E4H	RWr0004	Latest accumulation data		L H
	02E5H	RWr0005			
	02E6H	RWr0006	Undefined	Error code 8bit	
	02E7H	RWr0007	Undefined	Error assistance code 8bit	
3	02E8H	RWr0008	Undefined	Code 8bit	
	02E9H	RWr0009	Undefined		
	02EAH	RWr000A			
	02EBH	RWr000B			48bit
4	02ECH	RWr000C	General purpose data area		L H
	02EDH	RWr000D			
	02EEH	RWr000E	Undefined	Command No. (response) 8bit	
	02EFH	RWr000F	Undefined		16bit

■ Explanation for remote resister R→M

◎Net weight (signed 32 bit binary) (-99999 to 99999)

Net weight is indicated.

◎Gross weight (signed 32 bit binary) (-99999 to 99999)

Gross weight is indicated.

◎Latest accumulation data (signed 32 bit binary) (-99999 to 99999)

Latest accumulated value is indicated. The latest data that was weighing by indicator.

Can select gross weight and net weight by setting.

◎Error code (16bit binary) (0 to 255)

Error code of the Indicator is indicated. When the plural errors occur, the smaller figure (Over) is given high priority.

0: No error

1: Over

If the gross weight it shows OFL3 (the gross weight > gross over setting value).

If the net weight it shows OFL1 (the net weight > net over setting value).

If the latest accumulation data it shows "latest accumulation data > 99999".

If Tare display (Command No.19) it shows "tare weight > 99999".

2: Calibration error

3: Sequence error

◎Error assistance code (16bit binary) (0 to 9)

When error code is 2 or 3, it is an auxiliary to error code. No error is 0. When the error code is 2 and error assistance code is 9, it means [Calibration error 9]. When error code is "1 : Over", there is no corresponding error code.

◎Code (8bit binary)

Shows code that indicator is weighing.

◎Command No. response (16bit binary)

When the Command is set by Request flag 2, the same data is set here.



Point

About the net weight, the gross weight, and the latest accumulation data.

When it is negative data, it represented in two's complement.

The case of tare weight also, negative data is represented in two's complement.

■ Command list

Via request flag 2 changing operation mode according to the given command number.

* For reading and writing setting value for each code, make sure to pre-designate each setting code.

Read and write settings (R/W relay is read: ON, write: OFF)

Read and write setting (common)		Command No. (RWw000E)	General purpose data area (RWw000C to 000D)		LOCK (SW)	LOCK1 (setting)	LOCK2 (setting)
Upper limit		1	0 to 99999			⊙	
Lower limit		2	0 to 99999			⊙	
Near zero		3	0 to 99999			⊙	
Set point 1	For each code	4	0 to 99999			⊙	
Set point 2		5	0 to 99999			⊙	
Compensation		6	0 to 9999			⊙	
Over		7	0 to 9999			⊙	
Under		8	0 to 9999			⊙	
Final		9	0 to 99999			⊙	
Comparison inhibit time		11	0 to 999				⊙
Judging time		12	0 to 99				⊙
Complete output time		13	0 to 99				⊙
Compensation feeding time	For each code	14	0 to 999			⊙	
Auto free fall compensation regulation		15	0 to 99999			⊙	
Weighing function 1		16	0000 to 2224				⊙
Weighing function 2		17	00000 to 33121				⊙
Tare setting		18	0 to 99999			⊙	
Tare display (* read only)		19	-99999 to 99999				
Digital low pass filter		21	0 to 5				⊙
Moving average filter		22	1 to 512				⊙
Motion detection*1	range	23	RWw000C	0 to 99	⊙		⊙
	period		RWw000D	0 to 99	⊙		⊙
Zero tracking (period)		24	0 to 99		⊙		⊙
Zero tracking (range)		25	0 to 9999		⊙		⊙
Total comparison selection	For each code	26	0 to 2			⊙	
Total limit (high 4)		27	0 to 9999			⊙	
Total limit (under 5)		28	0 to 99999			⊙	
Count limit		29	0 to 9999			⊙	
Weighing function 3		31	001 to 329				⊙
Key invalid・LOCK		32	00000 to 11113				
Input selection 1		33	0000 to 8888				⊙
Input selection 2		34	00 to 88				⊙
Output selection 1		35	0000 to 9999				⊙
Output selection 2		36	00 to 99				⊙
Error output selection		37	00 to 55				⊙
Reserve output selection*1	Reserve 2	38	RWw000C	0 to 21			⊙
	Reserve 1		RWw000D	0 to 21			⊙

Read and write setting (common)		Command No. (RWw000E)	General purpose data area (RWw000C to 000D)	LOCK (SW)	LOCK1 (setting)	LOCK2 (setting)
Bag clamp output time		41	0 to 99			⊙
Discharging time		42	0 to 99			⊙
Weighing start time		43	0 to 99			⊙
AZ times		44	0 to 99			⊙
Judging times		45	0 to 99			⊙
Sequence mode 1		46	00000 to 11112			⊙
Sequence mode 2		47	000 to 111			⊙
Filling promotion weight		48	0 to 99999			⊙
Extended function selection 1		51	00000 to 11111	⊙		⊙
Extended function selection 2		52	00000 to 11211	⊙		⊙
Balance weight value		61	0 to 99999	⊙		⊙
Capacity		62	1 to 99999	⊙		⊙
Min scale division		63	1 to 50	⊙		⊙
DZ regulation value		64	0 to 9999	⊙		⊙
Display selection 1		65	00000 to 31447	⊙		⊙
Gravitational acceleration		66	97500 to 98500	⊙		⊙
Net over		67	0 to 99999			⊙
Gross over		68	0 to 99999			⊙
Display selection 2		69	0 to 1	⊙		⊙
D/A output mode		77	0 to 3			⊙
D/A zero output weight		78	0 to 99998			⊙
D/A full scale value		79	1 to 99999			⊙
BCD data updata rate		81	0 to 7			⊙
Equivalent calibration		92	1000 to 32000	⊙		⊙
Latest accumulation data (* read only)		93	0 to 99999			
Accumulation count (* read only)	For each code	94	0 to 9999			
Accumulation value (high 4) (* read only)		95	0 to 9999			
Accumulation value (under 5) (* read only)		96	0 to 99999			
Discharge count (* read only)		97	0 to 99999			
Total discharge count (* read only)		98	0 to 199998			

*1: Motion detection and reserve output selection are displayed the general purpose data area (32bit) is split between the upper bits (16bit) and the lower bits (16bit).

* Communications, all setting values treats while ignoring the decimal point.

* The writing the compensation data from CC-Link is disabled when the auto free fall compensation (setting mode 3-1) setting is "2: ON (communication option OFF)".

Operation instruction (R/W relay is OFF)

Command instruction	Command No. (RWw000E)	General purpose data area (RWw000C to 000D)
Net weight switch	0	12
Gross weight switch	0	13
One-touch tare subtraction	0	14
One-touch tare subtraction reset	0	15
Digital zero	0	16
Digital zero reset	0	17
Hold ON *	0	18
Hold OFF *	0	19
Accumulation clear	0	20
Accumulation data all clear	0	21
Accumulation command	0	22
Allow operate ON *	0	30
Allow operate OFF *	0	31
Weighing start ON *	0	32
Weighing start OFF *	0	33
Stop ON *	0	34
Stop OFF *	0	35
Discharging command	0	36
Manually discharge	0	37
Open discharge gate ON *	0	38
Open discharge gate OFF *	0	39
Close discharge gate ON *	0	40
Close discharge gate OFF *	0	41
Zero calibration	0	50
Span calibration (actual load calibration)	0	51
Span calibration (equivalent calibration)	0	52

* These are valid when the priority of level input signal (setting mode 4-7) setting is "1: Communication priority".

5-5. Address map (relay domain)

■ Remoto output M→R (PLC→F701-S)

Station	Buffer address	Remote output	Content		Class
1	0160H	RY0000	Request flag1		Communication Used for Communication with Host.
		RY0001			
		RY0002	Request flag2		
		RY0003	R/W		
		RY0004			
		RY0005			
		RY0006			
		RY0007			
		RY0008			
		RY0009	Allow operate		
		RY000A	Weighing start		
		RY000B	Stop		
		RY000C	Discharging command		
		RY000D	Manually discharge		
		RY000E	Open discharge gate		
		RY000F	Close discharge gate		
	0161H	RY0010	Digital zero		
		RY0011	Digital zero reset		
		RY0012	One-touch tare subtraction		
		RY0013	One-touch tare subtraction reset		
		RY0014	Hold		
		RY0015	Gross weight/Net weight switching display		
		RY0016			
		RY0017	Accumulation command		
		RY0018	Accumulation clear		
		RY0019	Accumulation data all clear		
		RY001A			
		RY001B			
		RY001C			
		RY001D			
		RY001E			
		RY001F			
2	0162H	RY0020	Weighing code	1	Valid only when Weighing code is set "Internal".
		RY0021		2	
		RY0022		4	
		RY0023	:		
		RY0024	Setting code	1	Valid only when setting code is set "Designating by relay".
		RY0025		2	
		RY0026		4	
		RY0027	:		:
	:	:	:		
	0163H	:	:	:	
	3	0164H	:	:	:
0165H		:	:	:	
4	0166H	:	:	:	
	0167H	:	:	:	

Remote input R→M (F701-S→PLC)

Station	Buffer address	Remote input	Content	Class
1	00E0H	RX0000	Reguest flag 1 response	Communication Used for Communication with Host.
		RX0001		
		RX0002	Reguest flag 2 response	
		RX0003	R/W (response)	
		RX0004		
		RX0005	CPU Normal operation	
		RX0006		
		RX0007		
		RX0008	+LOAD	
		RX0009	-LOAD	
		RX000A	OFL2	
		RX000B	-OFL2	
		RX000C	OFL1	
		RX000D	OFL3	
		RX000E	ZALM	
		RX000F	Calibration processing condition	
	00E1H	RX0010	HI LIM	
		RX0011	LO LIM	
		RX0012	HI	
		RX0013	GO	
		RX0014	LO	
		RX0015	SP1	
		RX0016	SP2	
		RX0017	SP3	
		RX0018	NZ	
		RX0019	COMPL.	
		RX001A	CLAMP	
		RX001B	D.CHG	
		RX001C	Filling promotion over	
		RX001D	TOTAL LIMIT	
		RX001E	STAB	
		RX001F	HOLD	

2	00E2H	RX0020	TARE				
		RX0021	NET				
		RX0022	ZT				
		RX0023	Final error				
		RX0024	Accumulation count error				
		RX0025	LOCK (SW)				
		RX0026	LOCK1 (setting)				
		RX0027	LOCK2 (setting)				
		RX0028	▲				
		RX0029	CZ				
		RX002A	▼				
		RX002B	Decimal place 1				
		RX002C	Decimal place 2				
		RX002D	Unit display 1				
		RX002E	Unit display 2				
		RX002F	Unit display 4				
		00E3H	RX0030	Weighing code		1	
			RX0031			2	
	RX0032		4				
	RX0033		:				
	RX0034		Setting code	1			
	RX0035			2			
	RX0036			4			
	RX0037		Discharge count error				
	RX0038		Sequence error No.	1			
	RX0039			2			
	RX003A			4			
	RX003B			8			
	RX003C		Calibration error No.	1			
	RX003D			2			
	RX003E	4					
	RX003F	8					

3	00E4H	:	:	:
	00E5H	:	:	:
4	00E6H	:	:	:
	00E7H	RX0070	:	:
		:	:	:
		RX007A	Error status flag	:
		RX007B	Remote ready	:
		:	:	:
		RX007F	:	:

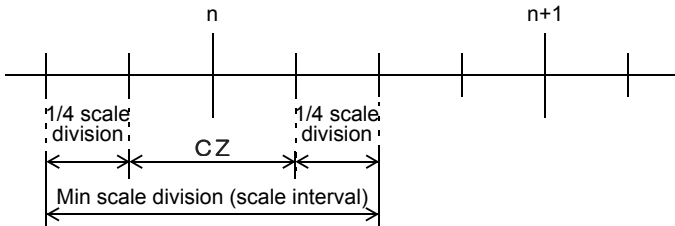
■ Remote output RY (PLC→F701-S) signal

Name of signal	Meaning of signal
Request flag1	During write setting value, the output signal is ON. After receiving request flag 1 response, the signal goes OFF.
Request flag2	During write general purpose command, the output signal is ON. After receiving request flag 2 response, the signal goes OFF.
R/W	Set READ/WRITE of general purpose command. Signal is ON → READ while OFF → WRITE. READ: Read out various setting value from the indicator. WRITE: Write various setting value and give the operation command to F701-S.
Allow operate *1	Makes the allow operate signal ON-level at the ON edge. Makes the allow operate signal OFF-level at the OFF edge.
Weighing start *1	Given the instruction to weighing start at the ON edge, make the weighing start signal ON-level. Makes the weighing start OFF-level at the OFF edge.
Stop *1	Given the instruction to weighing stop at the ON edge, make the stop signal ON-level. Makes the stop OFF-level at the OFF edge.
Discharging command	Given the instruction to discharge at the ON edge.
Manually discharge	Given the instruction to manually discharge at the ON edge.
Open discharge gate *1	Makes the open discharge gate signal ON-level at the ON edge. Makes the open discharge gate signal OFF-level at the OFF edge.
Close discharge gate *1	Makes the close discharge gate signal ON-level at the ON edge. Makes the close discharge gate signal OFF-level at the OFF edge.
Digital zero	Gross weight to zero at the ON edge.
Digital zero reset	Digital zero is reset at the ON edge.
One-touch tare subtraction	Tare subtraction is set at the ON edge.
One-touch tare subtraction reset	Tare subtraction is reset at the ON edge.
Hold *1	Hold weighing value. Hold is started at the ON edge and is Released at the OFF edge. Hold function is not available in sequence mode.
Gross weight/Net weight switching display	Switch to net weight at the ON edge. Switch to gross weight at the OFF edge.
Accumulation command	Accumulate weight values of the current to weighing code in the ON edge.
Accumulation clear	Clears accumulation values on weighing code at the ON edge.
Accumulation data all clear	Clears accumulation values on all code at the ON edge.
Weighing code	In the weighing code - setting code (setting mode 1-7) of F701-S, this signal is valid when the weighing code setting is "Internal". Set the weighing code (0 to 7) with BCD.
Setting code	Valid only when setting code selection (setting mode 8-2) of F701-S is "1: Designating by relay". Set the setting code (0 to 7) with BCD.

*1: These are valid when the priority of level input signal (setting mode 4-7) setting is "1: Communication priority".

■ Remote input RX (F701-S→PLC) signal

Name of signal	Meaning of signal
Request flag 1 response	After setting value was written, input signal is ON. It goes off after confirmation of request flag 1 output signal went OFF.
Request flag 2 response	After general purpose command was written, input signal is ON. It goes off after confirmation of request flag 2 output signal went OFF.
R/W response	When request flag 2 response signal goes ON, the R/W response signal goes the same status as R/W output signal.
CPU Normal operation	The signal is reversed between ON and OFF at approx. 0.5 second interval in normal operation.
+LOAD	Turns ON when signal is inputted beyond the span adjustment range of F701-S.
-LOAD	Turns ON when signal is inputted below the span adjustment range of F701-S.
OFL2	Turns ON when gross weight > capacity + 9 scale divisions.
-OFL2	If display selection 2 (setting mode 6-9) set to "0: gross weight < -capacity", turn ON when gross weight < -capacity. If display selection 2 (setting mode 6-9) set to "1: gross weight < -20 scale divisions", turn ON when gross weight < -20 scale divisions.
OFL1	Turns ON when net weight > net over setting value.
OFL3	Turns ON when gross weight > gross over setting value.
ZALM	Turns ON and ZALM occurred when the total amount of digital zero exceeds the DZ regulation value by digital zero or zero tracking operation.
Calibration processing condition	Turns ON during zero calibration or span calibration.
NZ	The timing of comparing will depend on the near zero comparison mode setting, usually turns ON when the weight value \leq near zero.
SP1	During weighing, turn ON when the weight value \geq (final - set point1).
SP2	During weighing, turn ON when the weight value \geq (final - set point2).
SP3	During weighing, turn ON when the weight value \geq (final - compensation).
HI	The timing of comparing will depend on the over / under comparison mode setting, usually turns ON when the weight value > (final + over).
GO	The timing of comparing will depend on the over / under comparison mode setting, usually turns ON when (final - under) \leq weight value \leq (final + over).
LO	The timing of comparing will depend on the over / under comparison mode setting, usually turns ON when the weight value < (final - under).
STAB	Turns ON while weight value of the indicator is stable.
COMPL.	Turns ON during the complete signal output.
HOLD	Turns ON while weight value is held.
HI LIM	The timing of comparing will depend on the upper / lower limit comparison mode setting, usually turns ON when the weight value > upper limit setting value.
LO LIM	The timing of comparing will depend on the upper / lower limit comparison mode setting, usually turns ON when the weight value < lower limit setting value.
CLAMP	During weighing, turns ON during the signal output.
D.CHG	When the weighing mode is sequence mode, turns ON when the discharge during discharging gate control.
Filling promotion over	During weighing, turn ON when the weight value \geq filling promotion weight. During weighing, turn OFF when the weight value < filling promotion weight.

TOTAL LIMIT	Turns ON during the total limit signal output.
TARE	Turns ON when tare subtraction is performed.
NET	Turns ON when the weight displayed is net, and turns OFF when it is gross.
ZT	Turns ON while zero tracking is in operation.
Final error	Turns ON when final < compensation.
Accumulation count error	Turns ON when the accumulation count reaches 9999.
LOCK (SW)	Turns ON if ON to the SW of rear panel, and turns OFF if OFF to the SW of rear panel.
LOCK1 (setting)	Shows the key invalid • LOCK (setting mode 3-2) setting Lock1 of F701-S. Turns ON if ON to LOCK1, and turns OFF if OFF to LOCK1.
LOCK2 (setting)	Shows the key invalid • LOCK (setting mode 3-2) setting Lock2 of F701-S. Turns ON if ON to LOCK2, and turns OFF if OFF to LOCK2.
▲, CZ, ▼	<p>▲ turns ON when center point of each instruction scale interval +1/4 scale division, ▼ turns ON when center point of each instruction scale interval -1/4 scale division.</p> <p>Both, the display selection 2 (setting mode 6-5) 1/4 scale division must be set to ON in advance.</p> <p>CZ turns ON when the true zero point ($0 \pm 1/4$ scale division).</p> <p>If set to ON the display selection 2 (setting mode 6-5) 1/4 scale division, turns ON at the center point of each instruction scale interval.</p>  <p>The diagram shows a horizontal line representing a scale interval. It is divided into four equal segments by vertical tick marks. The first segment is labeled '1/4 scale division' with a double-headed arrow. The second segment is labeled 'CZ' with a double-headed arrow. The third segment is also labeled '1/4 scale division' with a double-headed arrow. The fourth segment is labeled 'Min scale division (scale interval)' with a double-headed arrow. Above the line, the points are labeled 'n' and 'n+1'.</p>
Unit display 1	Shows unit. 0: None, 1: t, 2: g, 3: kg, 4: lb
Decimal place	Shows decimal place. 0: #####, 1: #####., 2: ###.##, 3: ##.###
Weighing code	Display code that indicator is weighing (weighing code).
Setting code	Display setting code that are specified via CC-Link I/F.
Discharge count error	Turns ON when the discharge count reaches 99999.
Sequence error No.	Shows the error No. of the sequence error. "0" means that no sequence error is given.
Calibration error No.	Shows the error No. of the calibration error. "0" means that no calibration error is given.
Error status flag	When over (over each of the indicated value), calibration or sequence error occurred, the signal turns ON.
Remote ready	After initial processing of F701-S was done and the error status flag is OFF, the signal turn ON.

Attention

- Please confirm ON of remote ready after turning on the power supply.
 - Remote ready is OFF, when the error status flag is ON. In that case, take appropriate measures for the error status flag is OFF.
 - Don't turn ON request flag 1 (RY0000) and request flag 2 (RY0002) while the remote ready is OFF. There is a possibility for it to become impossible to operate normally if writing to remote output or to remote register M→R before it is turned ON.
- Moreover, please conduct initialize process on PLC for access to F701-S if they were turned OFF due to the power failure etc.

5-6. Setting procedure

(The Upper signal level is ON. The Lower signal level is OFF.)

■ Exclusive data area for setting value by request flag 1

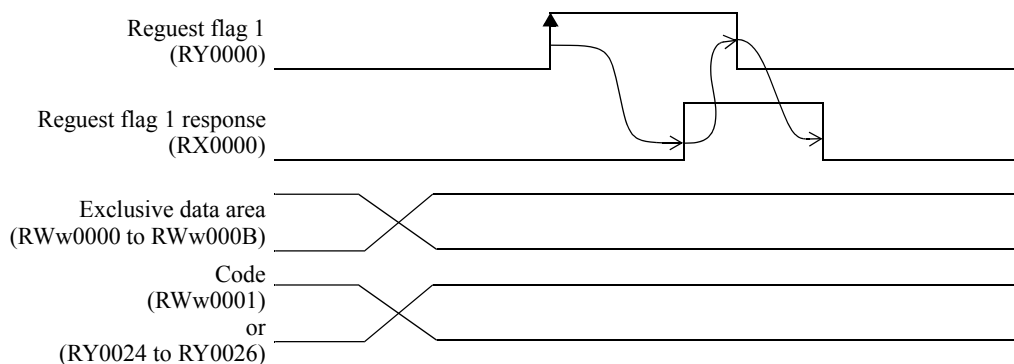
Request flag 1 is used when setting value is written in.

The setting value is written in by request flag 1 ON edge while request flag 1, 2 and request flag response 1, 2 are OFF.

RWw0000 to RWw000B become exclusive data area.

When setting of F701-S is "designating by relay", it is stored in the code specified in RY0024 to RY0026.

When setting of F701-S is "designating with data", it is stored in the code specified in RWw0001 upper 8bit.



■ General purpose data area for setting value, command No. by request flag 2

Request flag 2 is used for reading out and writing in setting value and executing operation command.

It is operated at ON edge of request flag 2 when request flag 1, request flag 1 response and request flag 2 response are OFF.

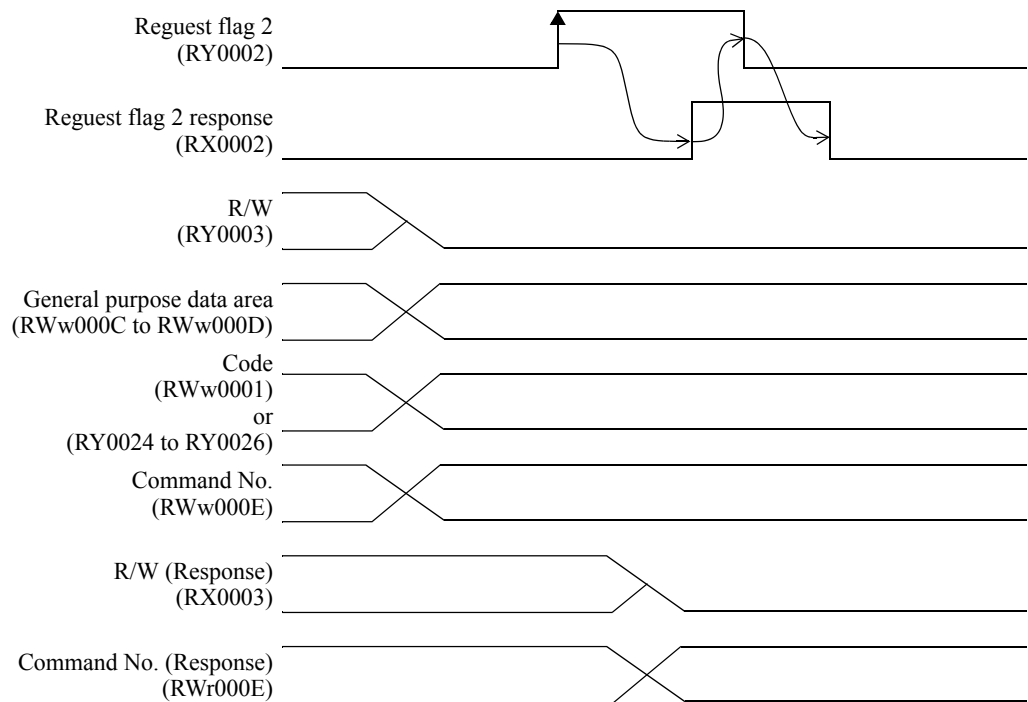
RWw000C to RWw000D become general purpose data area.

RWw000E become command No. area.

When setting code of F701-S is at select with data, upper 8bit of RWw0001 becomes setting code area (binary).

When setting code of F701-S is at select with relay, RY0024 to RY0026 becomes setting code area. (BCD)

Turn OFF R/W when writing in setting value and executing operation command.

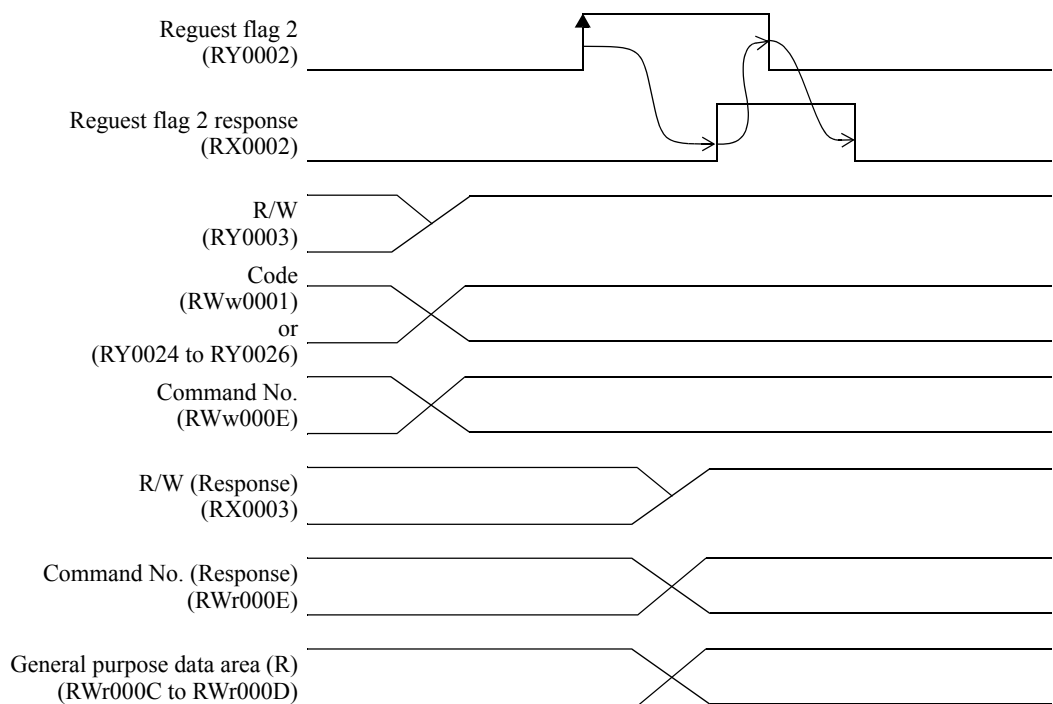


■ Reading out setting value

Turn ON R/W for reading out setting value.

The setting value of selected code is outputted.

Read out general purpose data area (R) after confirming request flag 2 response ON.



6. DeviceNet INTERFACE [ODN]

Introduction

This document describes specifications of the DeviceNet option to link a PLC and F701-S.

By using DeviceNet, the F701-S can be controlled directly from the PLC, resulting in substantial reductions in wiring.

This unit is supporting functions that read current the indicated value and status, reading and writing setting value, and command operation for F701-S.

Parameters such as a slave are to be set at the front of the F701-S.

Also, there is no need to set the baud rate of the F701-S since it automatically follows the master.

The following outputs refer to signals from the master to the slave (F701-S), and inputs refer to signals from the slave (F701-S) to the master.

DeviceNet is a registered trademark of ODVA (Open DeviceNet Vendor Association).

About F701-S DeviceNet function

Remote I/O	IN (65H*) 8word, OUT (64H*) 4word
	- Read out the Gross weight and Net weight
	- Read out the Operation status
	- Read out the set value
	- Write in the set value
	- Operation command

Message network This unit is not supported.

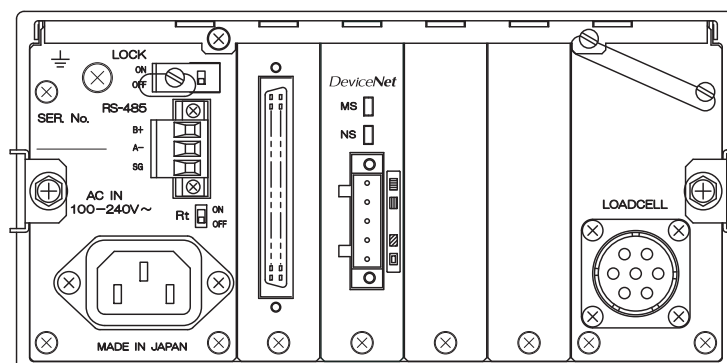
* : This is the instance of assembly object. (Is internally set at F701-S.)



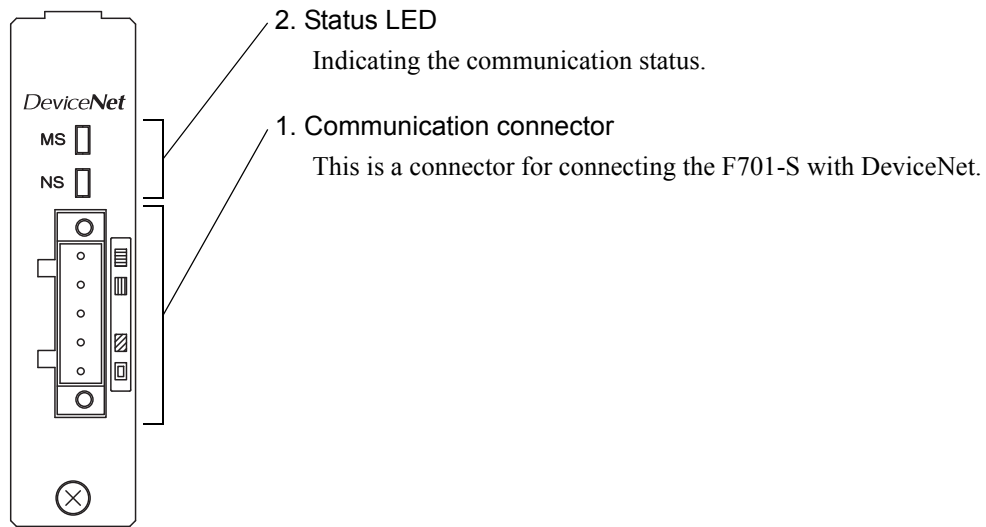
Point

Remote I/O communications regularly exchange data between the master and slave.

6-1. Dimensions



6-2. Name of each part

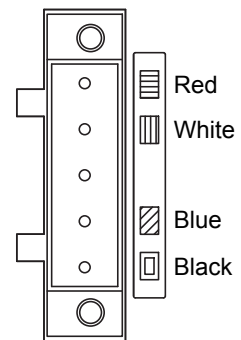


1. Communication connector

Prepare the power source of DC 24V.

Relation between each signal line and color chip are as follows.

The applicable plug is MSTBP2.5/5-STF-5.08AU (accessory) manufactured by PHENIX CONTACT or equivalent.



Color	Type of signal
Red	Power cable + (V+)
White	Communication data High (CAN H)
—	Shield
Blue	Communication data Low (CAN L)
Black	Power cable - (V-)

2. Status LED

Communication status is displayed by LED.

MS: Indicating the F701-S status.

MS (Module Status)	LED	Status
	Red Turns ON	Trouble
	Red Blinks	Trouble
	Green Blinks	Trouble
	Green Turns ON	Normal

NS: Indicating the Network status.

NS (Network Status)	LED	Status
	Red Turns ON	Bus OFF, Node Address Overlap
	Red Blinks	Communication time-out
	Green Blinks	Waiting for Connection establishment
	Green Turns ON	Normal

6-3. DeviceNet interface related setting values

■Node address (setting mode 8-4)

Setting the Node address. (Initial value: 0)
(Input range/0 - 63)

* Setting of the communications speed is not required.

6-4. About remote I/O

The F701-S can send status and indicated values through DeviceNet with a delay of approx. 100msec compared with external I/O signals. (in remote I/O communications.)

Furthermore, the delay time is affected by the cycle time of the communications, scan time of the PLC, etc..

Therefore, for cases where the speed is severe, use the control I/O of the F701-S, and not via communications.

In the same way, since input signals such as the D/Z command also cause a delayed time when used via communications, use the control I/O for cases requiring speed.

Output (When viewed from the master : input data) are outputted to communications and the control I/O in parallel irrespective of settings of the F701-S.

Some signals of the input signal (When viewed from the master : output data) communications or the control I/O can be selected on a block-by-block basis.



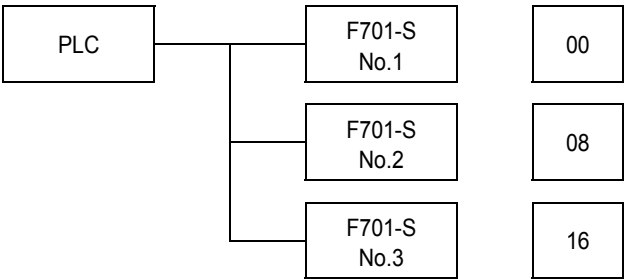
Point

All input and output signals are positive logic. (1: ON, 0: OFF)
The operation is similar to main input and output signal.

6-5. About PLC address

PLC via DeviceNet, each F701-S occupies. Input 8CH (word) and output 4CH (word) respectively.

For example, when three F701-Ss are used:



* Address of F701-S DeviceNet I/F should be set without overlapping as shown above when configurator is not used.

6-6. I/O format

Input Data (F701-S→Master (PLC))

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
n ch	8	Gross weight (x1000) 4	2	1	8	Gross weight (x100) 4	2	1	8	Gross weight (x10) 4	2	1	8	Gross weight (x1) 4	2	1
n+1 ch	Gross weight Sign	Unit 4	2	1	Decimal place 2	1		ZT	NET	TARE	HOLD	STAB		Gross weight (x10000) 4	2	1
n+2 ch		Net weight (x1000) 4	2	1		Net weight (x100) 4	2	1		Net weight (x10) 4	2	1		Net weight (x1) 4	2	1
n+3 ch	Net weight Sign	Weighing code 4	2	1	▼	Status on the weight display CZ	▲	OVER	Discharge count error 8	LOCK2 (Setting) 4	LOCK1 (Setting) 2	LOCK (SW) 1		Net weight (x10000) 8	2	1
n+4 ch		Read out data (x1000) 4	2	1		Read out data (x100) 4	2	1		Read out data (x10) 4	2	1		Read out data (x1) 4	2	1
n+5 ch		Cycle No. 4	2	1	Command response 8	Command response No. (x10) 4	2	1		Command response No. (x1) 4	2	1		Read out data (x10000) 8	2	1
n+6 ch	Read out data Sign	OVER	Total limit	Filling promotion over	D.CHG	CLAMP	COMPL.	NZ	SP3	SP2	SP1	LO	GO	HI	LO LIM	HI LIM
n+7 ch	Accumulation count error	Final error	-OFL2	OFL2	-LOAD	LOAD	ZALM	Calibration processing condition	8	4	2	1		Sequence error No. 4	2	1

Output Data (Master (PLC)→F701-S)

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
m ch	8	Write in data (x1000) 4	2	1	8	Write in data (x100) 4	2	1		Write in data (x10) 4	2	1	8	Write in data (x1) 4	2	1
m+1 ch		Command type 2	1	Command request	8	Command No. (x10) 4	2	1		Command No. (x1) 4	2	1		Write in data (x10000) 4	2	1
m+2 ch	Close discharge gate	Open discharge gate	Manually discharge	Discharging command	Stop	Weighing start	Allow operate	Accumulation command	Accumulation data all clear	Accumulation clear	HOLD	D/Z OFF	D/Z ON	TARE OFF	TARE ON	G/N
m+3 ch																

■ Explanation of input data (F701-S→Master (PLC))

◎Gross weight

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
n ch																
n+1 ch																
n+2 ch																
n+3 ch																
n+4 ch																
n+5 ch																
n+6 ch																
n+7 ch																

A gross weight value and a sign are expressed. A sign is set to "1" at the time of "-".

◎Net weight

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
n ch																
n+1 ch																
n+2 ch																
n+3 ch																
n+4 ch																
n+5 ch																
n+6 ch																
n+7 ch																

A net weight value and a sign are expressed. A sign is set to "1" at the time of "-".

◎Read out data

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
n ch																
n+1 ch																
n+2 ch																
n+3 ch																
n+4 ch																
n+5 ch																
n+6 ch																
n+7 ch																

The set point of the contents specified by the command request is expressed.

When the read data is negative, the sign is "1". The OVER is used when it is "tare > 99999" at reading of tare display (command No.19), or "latest accumulation weight > 99999" at reading of latest accumulation data (command No.95).

◎Decimal place

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
n ch																
n+1 ch																
n+2 ch																
n+3 ch																
n+4 ch																
n+5 ch																
n+6 ch																
n+7 ch																

The position of decimal place is expressed. (2bit of b10 and b11 represents 0 to 3.)

0: 0, 1: 0.0, 2: 0.00, 3: 0.000

◎Unit

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
n ch																
n+1 ch																
n+2 ch																
n+3 ch																
n+4 ch																
n+5 ch																
n+6 ch																
n+7 ch																

The unit is expressed. (3bit of b12 to b14 represents 0 to 4.)

0: None, 1: t, 2: g, 3: kg, 4: lb

◎Status

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
n ch																
n+1 ch																
n+2 ch																
n+3 ch																
n+4 ch																
n+5 ch																
n+6 ch																
n+7 ch																

Each present status is expressed. It is set to "1" when conditions are fulfilled.

Status	Condition
STAB	It is set to "1" when the weight value is stable.
HOLD	It is set to "1" when the weight value is held.
TARE	It is set to "1" when tare subtraction is performed.
NET	It is set to "1" while net weight is displayed, and "0" while gross weight is displayed.
ZT	It is set to "1" when the zero tracking function is working.
HI LIM	The timing of comparing will depend on the upper / lower limit comparison mode setting, usually it is set to "1" when the weight value > upper limit setting value.
LO LIM	The timing of comparing will depend on the upper / lower limit comparison mode setting, usually it is set to "1" when the weight value < lower limit setting value.
HI	The timing of comparing will depend on the over / under comparison mode setting, usually it is set to "1" when the weight value > (final + over).
GO	The timing of comparing will depend on the over / under comparison mode setting, usually it is set to "1" when $(\text{final} - \text{under}) \leq \text{weight value} \leq (\text{final} + \text{over})$.
LO	The timing of comparing will depend on the over / under comparison mode setting, usually it is set to "1" when the weight value < (final - under).
SP1	During weighing, it is set to "1" when the weight value $\geq (\text{Final} - \text{Set point 1})$.
SP2	During weighing, it is set to "1" when the weight value $\geq (\text{Final} - \text{Set point 2})$.
SP3	During weighing, it is set to "1" when the weight value $\geq (\text{Final} - \text{Compensation})$.
NZ	The timing of comparing will depend on the near zero comparison mode setting, usually it is set to "1" when the weight value \leq near zero.
COMPL.	It is set to "1" while the complete signal is output.
CLAMP	During weighing, it is set to "1" while the clamp signal is output.
D.CHG	When the weighing mode is sequence mode, it is set to "1" when the discharge during discharging gate control.
Filling promotion over	During weighing, it is set to "1" when the weight value \geq filling promotion weight.
Total limit	It is set to "1" while the total limit signal is output.

◎LOCK

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
n ch																
n+1 ch																
n+2 ch																
n+3 ch																
n+4 ch																
n+5 ch																
n+6 ch																
n+7 ch																

When the LOCK SW of rear panel is ON, the LOCK(SW) is "1".

When the setting LOCK1 (setting mode 3-2) is ON, the LOCK1(setting) is "1".

When the setting LOCK2 (setting mode 3-2) is ON, the LOCK2(setting) is "1".

◎Status on the weight display

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
n ch																
n+1 ch																
n+2 ch																
n+3 ch																
n+4 ch																
n+5 ch																
n+6 ch																
n+7 ch																

Represents the status regarding weight that current display. If the NET(status) is "1", it is status information about net weight, and if the NET is "0", it is status information about gross weight.

Status	Condition
OVER	If the gross weight OVER is "1" when OFL3 (the gross weight > gross over setting value), and if the net weight OVER is "1" when OFL1 (the net weight > net over setting value).
▲	It is "1" when center point of each instruction scale interval +1/4 scale division. However, 1/4 scale division (setting mode 6-5) must be set to ON in advance.
CZ	It is "1" when the true zero point ($0 \pm 1/4$ scale division). However, if set to ON the 1/4 scale division (setting mode 6-5), it is "1" at the center point of each instruction scale interval.
▼	It is "1" when center point of each instruction scale interval -1/4 scale division. However, 1/4 scale division (setting mode 6-5) must be set to ON in advance.

◎Weighing code

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
n ch																
n+1 ch																
n+2 ch																
n+3 ch																
n+4 ch																
n+5 ch																
n+6 ch																
n+7 ch																

Display code that is current weighing. (3bit of b12 to b14 represents 0 to 7.)

◎Cycle No.

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
n ch																
n+1 ch																
n+2 ch																
n+3 ch																
n+4 ch																
n+5 ch																
n+6 ch																
n+7 ch																

It repeats "0" → "1" → "2" → "3" → "4" → "5" → "6" → "7" → "0" → ...

◎Sequence error No.

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
n ch																
n+1 ch																
n+2 ch																
n+3 ch																
n+4 ch																
n+5 ch																
n+6 ch																
n+7 ch																

The error number generated at the time of sequence mode is expressed. (4bit of b0 to b3 represents 0 to 9.) "0" means that no sequence error is given.

◎Calibration error No.

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
n ch																
n+1 ch																
n+2 ch																
n+3 ch																
n+4 ch																
n+5 ch																
n+6 ch																
n+7 ch																

During calibration, represents the number of errors that occur. (4bit of b4 to b7 represents 0 and 2 to 9.) "0" means that no calibration error is given.

◎Calibration processing condition

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
n ch																
n+1 ch																
n+2 ch																
n+3 ch																
n+4 ch																
n+5 ch																
n+6 ch																
n+7 ch																

Calibration processing condition is expressed. It is set to "1" while zero calibration or span calibration.

◎Error status

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
n ch																
n+1 ch																
n+2 ch																
n+3 ch																
n+4 ch																
n+5 ch																
n+6 ch																
n+7 ch																

Each present error status is expressed. It is set to "1" when conditions are fulfilled.

Error	Condition
ZALM	ZALM occurs and set to "1" when the total amount of digital zero exceeds the DZ regulation value by digital zero or zero tracking operation.
+LOAD	It is set to "1" when a signal beyond the signal input range of the F701-S is inputted.
-LOAD	It is set to "1" when a signal below the signal input range of the F701-S is inputted.
OFL2	It is set to "1" when the gross weight > (capacity + 9scale divisions).
-OFL2	If display selection 2 (setting mode 6-9) set to "0: gross weight < -capacity", it is "1" when gross weight < -capacity. If display selection 2 (setting mode 6-9) set to "1: gross weight < -20 scale divisions", it is "1" when gross weight < -20 scale divisions.
Final error	It is set to "1" when the Final < compensation.
Accumulation count error	It is set to "1" when the accumulation count reaches 9999.
Discharge count error	It is set to "1" when the discharge count reaches 99999.

◎Command response, Command response No.

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
n ch																
n+1 ch																
n+2 ch																
n+3 ch																
n+4 ch																
n+5 ch																
n+6 ch																
n+7 ch																

It is set when there is a response from F701-S to a master.

Response	Condition
Command response	It is set to "1" when there is a response from F701-S to a command request.
Command response No.	The same value as command request No. is set simultaneously with a command response.

■Explanation about output data (Master (PLC)→F701-S)

◎Write in data

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
m ch																
m+1 ch																
m+2 ch																
m+3 ch																

The set point written in from a master to F701-S is set here.

◎Command type, Command request, Command No.

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
m ch																
m+1 ch																
m+2 ch																
m+3 ch																

When sending the command to F701-S from a master, it sets data here.

Command	Condition
Command type	01: READ When reading the set point from F701-S to a master 10: WRITE When writing the set point in F701-S from a master 11: COMMAND When giving commands from a master to F701-S
Command request	When sending a command from F701-S, "1" is set here. Please set after checking the command type and writing data.
Command No.	A setup and the contents of read out are decided by this value.

◎Hold, Allow operate, Weighing start, Stop, Open discharge gate, Close discharge gate

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
m ch																
m+1 ch																
m+2 ch																
m+3 ch																

These function are valid when the priority of level input signal (setting mode 4-7) setting is "1 : communication priority".

By changing "0" → "1", turns ON-level each signal.

By changing "1" → "0", turns OFF-level each signal.

◎Discharging command

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
m ch																
m+1 ch																
m+2 ch																
m+3 ch																

By changing "0" → "1", it becomes a discharging command signal.

◎Manually discharge

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
m ch																
m+1 ch																
m+2 ch																
m+3 ch																

By changing "0" → "1", it becomes a manually discharge signal.

◎G/N

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
m ch																
m+1 ch																
m+2 ch																
m+3 ch																

By changing "0" → "1", a weight display is switched to net weight.

By changing "1" → "0", a weight display is switched to gross weight.

◎TARE ON

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
m ch																
m+1 ch																
m+2 ch																
m+3 ch																

By changing "0" → "1", it performs TARE ON.

◎TARE OFF

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
m ch																
m+1 ch																
m+2 ch																
m+3 ch																

By changing "0" → "1", it performs TARE OFF.

◎D/Z ON

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
m ch																
m+1 ch																
m+2 ch																
m+3 ch																

By changing "0" → "1", it performs D/Z ON.

◎D/Z OFF

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
m ch																
m+1 ch																
m+2 ch																
m+3 ch																

By changing "0" → "1", it performs D/Z OFF.

◎Accumulation clear

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
m ch																
m+1 ch																
m+2 ch																
m+3 ch																

By changing "0" → "1", it performs accumulation clear.

The accumulation value of the weighing code is cleared.

◎Accumulation data all clear

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
m ch																
m+1 ch																
m+2 ch																
m+3 ch																

By changing "0" → "1", it performs accumulation data all clear.

The accumulation value of the all code is cleared.

◎Accumulation command

	b15	b14	b13	b12	b11	b10	b9	b8	b7	b6	b5	b4	b3	b2	b1	b0
m ch																
m+1 ch																
m+2 ch																
m+3 ch																

By changing "0" → "1", it performs accumulation command.

6-7. Write in from master to F701-S

Set the command type for "10"(WRITE). The contents written in decided by the command No.

- * However, for the setting values for each code, please perform a write from a pre-set to setting code (command No.20).
- * If the LOCK is ON can not write. (In this case the command response is returned "0".)
- * The writing the compensation data from DeviceNet is disabled when the auto free fall compensation (setting mode 3-1) setting is "2: ON (communication option OFF)".

6-8. Read out from F701-S to master

Set the command type for "01"(READ). The contents are decided by command No.

- * However, for the setting values for each code, please perform a read from a pre-set to setting code (command No.20).

6-9. Command No. and each setting value

Command No.	Setting value		Wrighting data or Reading data	LOCK (SW)	LOCK1 (setting)	LOCK2 (setting)
1	Upper limit		0 to 99999		⊙	
2	Lower limit		0 to 99999		⊙	
3	Near zero		0 to 99999		⊙	
4	Set point 1	For each code	0 to 99999		⊙	
5	Set point 2		0 to 99999		⊙	
6	Compensation		0 to 9999		⊙	
7	Over		0 to 9999		⊙	
8	Under		0 to 9999		⊙	
9	Final		0 to 99999		⊙	
10	Weighing code		0 to 7			
11	Comparison inhibit time		0 to 999			⊙
12	Judging time		0 to 99			⊙
13	Complete output time		0 to 99			⊙
14	Compensation feeding time	For each code	0 to 999		⊙	
15	Auto free fall compensation regulation		0 to 99999		⊙	
16	Weighing function 1		0000 to 2224			⊙
17	Weighing function 2		00000 to 33121			⊙
18	Tare setting		0 to 99999		⊙	
19	Tare display (* read only)		-99999 to 99999			

6. DeviceNet INTERFACE [ODN]

20	Setting code		0 to 7			
21	Digital low pass filter		0 to 5			⊙
22	Moving average filter		1 to 512			⊙
23	Motion detection* (period - range)		00-00 to 99-99	⊙		⊙
24	Zero tracking (period)		0 to 99	⊙		⊙
25	Zero tracking (range)		0 to 9999	⊙		⊙
26	Total comparison selection	For each code	0 to 2		⊙	
27	Total limit (high 4)		0 to 9999		⊙	
28	Total limit (under 5)		0 to 99999		⊙	
29	Count limit		0 to 9999		⊙	
31	Weighing function 3		001 to 329			⊙
32	Key invalid • LOCK		00000 to 11113			
33	Input selection 1		0000 to 8888			⊙
34	Input selection 2		00 to 88			⊙
35	Output selection 1		0000 to 9999			⊙
36	Output selection 2		00 to 99			⊙
37	Error output selection		00 to 55			⊙
38	Reserve output selection*		00-00 to 21-21			⊙
41	Bag clamp output time		0 to 99			⊙
42	Discharging time		0 to 99			⊙
43	Weighing start time		0 to 99			⊙
44	AZ times		0 to 99			⊙
45	Judging times		0 to 99			⊙
46	Sequence mode 1		00000 to 11112			⊙
47	Sequence mode 2		000v111			⊙
48	Filling Promotion Weight		0 to 99999			⊙
51	Extended function selection 1		00000 to 11111	⊙		⊙
52	Extended function selection 2		00000 to 11211	⊙		⊙
61	Balance weight value		0 to 99999	⊙		⊙
62	Capacity		1 to 99999	⊙		⊙
63	Min scale division		1 to 50	⊙		⊙
64	DZ regulation value		0 to 9999	⊙		⊙
65	Display selection 1		00000 to 31447	⊙		⊙
66	Gravitational acceleration		97500 to 98500	⊙		⊙
67	Net over		0 to 99999			⊙
68	Gross over		0 to 99999			⊙
69	Display selection 2		0 to 1	⊙		⊙
77	D/A output mode		0 to 3			⊙
78	D/A zero output weight		0 to 99998			⊙
79	D/A full scale value		1 to 99999			⊙
81	BCD data updata rate		0 to 7			⊙
92	Equivalent calibration		1000 to 32000	⊙		⊙
93	Latest accumulation data		Read only			
94	Accumulation count	For each code	Read only			
95	Accumulation value (high 4)		Read only			
96	Accumulation value (under 5)		Read only			

97	Discharge count	For each code	Read only			
98	Total discharge count (high 4)		Read only			
99	Total discharge count (under 5)		Read only			

* Motion detection, and reserve output selection are displayed divided into two digits to high two digits and under 2 digits.

Motion detection (period) • Reserve output 1: setting value (x10000), setting value (x1000)

Motion detection (range) • Reserve output 2: setting value (x10), setting value (x1)

* If change the code of the current weighing, please write to the weighing code (command No.10). However, it is valid when the weighing code (setting mode 1-7) of F701-S setting is "Internal".

* Communications, all setting values treats while ignoring the decimal point.

6-10.Command to F701-S from master

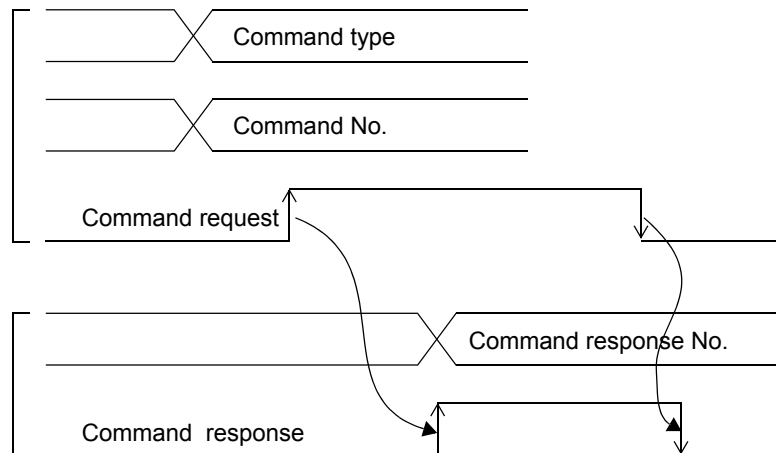
Set the command type for "11"(COMMAND). Determine what the directive at command No..

When the command request is set for "1", the command to F701-S are run.

Command No.	Command name	Command content
12	Display change net weight	Switches the weight display to net weight.
13	Display change gross weight	Switches the weight display to gross weight.
14	One-touch tare subtraction	Executes one-touch tare subtraction.
15	One-touch tare subtraction reset	Resets one-touch tare subtraction.
16	Digital zero	Zeroes gross weight.
17	Digital zero reset	Resets digital zero.
18	Hold ON *	Holds weight value.
19	Hold OFF *	Cancels weight value hold.
20	Accumulation clear	Clears accumulation value on weighing code.
21	Accumulation data all clear	Clears accumulation value on all codes.
22	Accumulation command	Accumulates weight value on the code in weighing.
30	Allow operate ON *	Makes the allow operate signal ON-level.
31	Allow operate OFF *	Makes the allow operate signal OFF-level.
32	Weighing start ON *	Given the instruction to weighing start, makes the weighing start signal ON-level.
33	Weighing start OFF *	Makes the weighing start signal OFF-level.
34	Stop ON *	Given the instruction to weighing stop, makes the stop signal ON-level.
35	Stop OFF *	Makes the stop signal OFF-level.
36	Discharging command	Given the instruction to discharge.
37	Manually discharge	Given the instruction to manually discharge.
38	Open discharge gate ON *	Makes the open discharge gate signal ON-level.
39	Open discharge gate OFF *	Makes the open discharge gate signal OFF-level.
40	Close discharge gate ON *	Makes the close discharge gate signal ON-level.
41	Close discharge gate OFF *	Makes the close discharge gate signal OFF-level.
50	Zero calibration	Executes zero calibration.
51	Span calibration (actual load calibration)	Executes span calibration (actual load calibration).
52	Span calibration (equivalent calibration)	Executes span calibration (equivalent calibration).

* These are valid when the priority of level input signal (setting mode 4-7) setting is "1: Communication priority".

6-11.Timing of a command request and a command response



■When each setup is read

Please advance a command request after setting command type and command No. After a command response comes out, please read read-out data.

■When each setup is written in

Please advance a command request after writing in command type and command No.

- * A command request should maintain the status of "1" until a command response comes out.
- * Usually, command response and the reading data are returned the same data as the writing data respectively. However, in both the command response and the reading data are returned to zero for an invalid command.

7. PROFIBUS INTERFACE [PRF]

Introduction

The F701-S PROFIBUS I/F is described in the following.

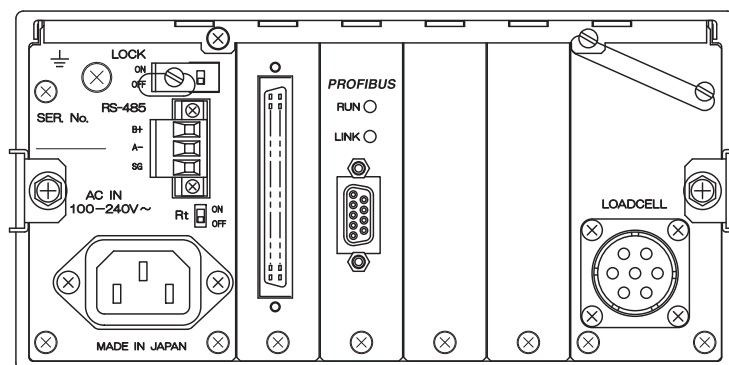
For reading it, basic knowledge of PLC and PROFIBUS is required.

For basic knowledge of PROFIBUS, see specialized references.

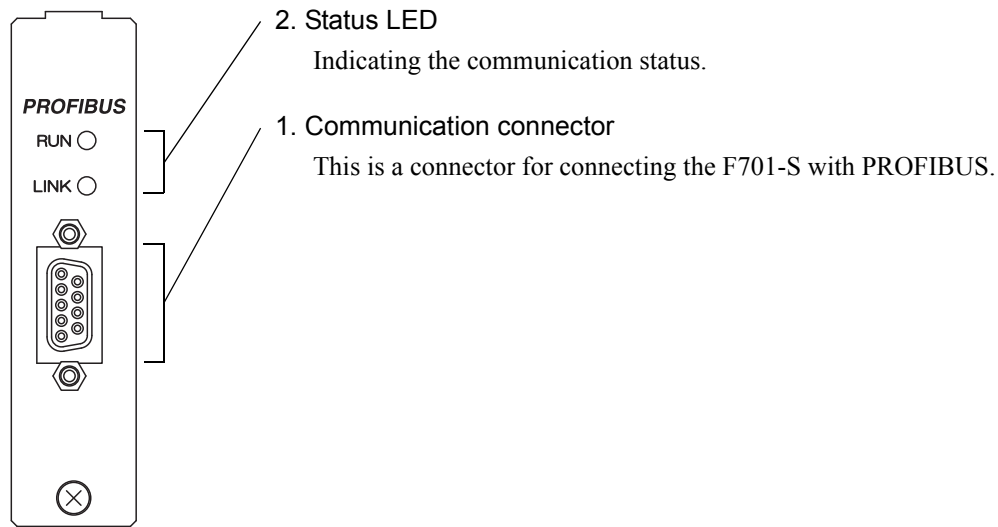
7-1. Specifications

- The F701-S mounted with the PROFIBUS I/F can be connected as a slave device to a PROFIBUS fieldbus. (Compatible with PROFIBUS-DP V0.)
- Communication speed: 9.6 kbps - 12 Mbps (automatically following the master)
* However, 45.45kbps is not supported.
- Occupied memory: OUT/12 bytes (6 words)
IN/26 bytes (13 words)
* In allocation, be careful to prevent the address from overlapping with other slaves.
- Station No.: Set the station address can range from 0 to 125.
- GSD file name: UNIP0DC4.GSD
- Sync mode and freeze mode are supported.
- Special clear mode (Fail safe mode) is not supported.

7-2. Dimensions



7-3. Name of each part



1. Communication connector

The function of each signal is as follows:

Pin No.	Signal name	Function
1	—	(Not used)
2	—	(Not used)
3	RxD/TxD-P	Data reception/send data plus
4	CNTR—P	Control signal (RTS)
5	DGND	Data ground (0V)
6	VP	Communication power (5V)
7	—	(Not used)
8	RxD/TxD-N	Data reception/send data minus
9	—	(Not used)

* Prepare 9-pin D-Sub connector plug type for the connection.

* Use a PROFIBUS-qualified connector and cable.

For PROFIBUS-qualified products, contact the PROFIBUS Organization.

* When the F701-S comes at the end, be sure to connect a terminal resistor.

For the method of connecting the terminal resistor, check with specialized references.

2. Status LED

- LINK: Lights while the F701-S is linked with the master.

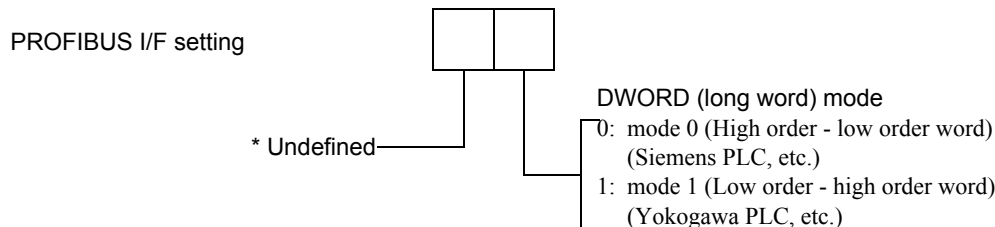
- RUN: Lights when the F701-S is normal.

7-4. PROFIBUS interface related setting values

■DWORD (long word) mode (setting mode 8-5)

When the data on the address map is DWORD (long word), assignment of high order and lower order can be determined. (Initial value: 00)

The setting made here is common to IN data and OUT data.



■PROFIBUS baud rate display (setting mode 8-6)

In communication, the master device is automatically followed. That baud rate is displayed.

PROFIBUS
baud rate display

Display pattern					Function
			1	2	12M bps
				6	6M bps
				3	3M bps
			1.	5	1.5M bps
		5	0	0	500k bps
1	8	7.	5		187.5k bps
9	3.	7	5		93.75k bps
	1	9.	2		19.2k bps
			9.	6	9.6k bps
	—	—	—	—	Not linked or no PROFIBUS I/F mounted

■Station No. (setting mode 8-7)

Set the station address. (Initial value: 125)

(Input range/0 - 125)

* Station address change from the master is not supported.

7-5. Address map

This product occupies OUT/12byte (6 word) and IN/26byte (13 word) memory.

IN allocation, be careful to prevent the address from overlapping with other slaves.

The data used for writing and reading is handled with the decimal point ignored, but the F701-S recognizes the decimal point at the specified digit position.

For example, when "50" is written in judging time from PLC to F701-S, the F701-S handles it as 5.0[sec].

In the following explanation, ON corresponds to 1 and OFF corresponds to 0. Also, an ON edge corresponds (0→1), and an OFF edge corresponds to (1→0).

■ OUT data (6 words)

PLC → F701-S																DWORD mode			
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	(bit)	mode 0	mode 1
1st word																	Write data	(high order)	(low order)
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	(bit)		
2nd word																	Write data	(low order)	(high order)
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	(bit)		
3rd word	⑮	⑭	⑬	⑫	⑪	⑩	⑨	⑧	⑦	⑥	⑤	④	③	②	①		Command bit		

- | | |
|---|------------------------|
| ① Gross weight/Net weight switching display | ⑨ Accumulation command |
| ② One-touch tare subtraction | ⑩ Allow operate |
| ③ One-touch tare subtraction reset | ⑪ Weighing start |
| ④ Digital zero | ⑫ Stop |
| ⑤ Digital zero reset | ⑬ Discharging command |
| ⑥ Hold | ⑭ Manually discharge |
| ⑦ Accumulation clear | ⑮ Open discharge gate |
| ⑧ Accumulation data all clear | ⑯ Close discharge gate |

Attention

Please ① to ⑯ do not run concurrently.
Please to run one at a time reliably.

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	(bit)	Command bit	
4th word														③	②	①			

- | |
|--|
| ① Zero calibration |
| ② Span calibration (actual load calibration) |
| ③ Span calibration (equivalent calibration) |

Attention

Please ① to ③ do not run concurrently.
Please to run one at a time reliably.

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	(bit)	Command No.	
5th word																			

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	(bit)	Command bit	
6th word														③	②	①			

- | |
|-------------------------------------|
| ① R/W (R: 1 / W: 0) |
| ② Command request |
| ③ "Keep alive" confirmation request |

■ Explanation about OUT data

○ Write data

Use this when writing data by using the command request.

Write data consists of 32-bit binary (2 words), the high order and low order of which are changed by DWORD mode (setting mode 8-5) of the F701-S.

* Settings that are marked with ☉ in the column of each code, you must specify the setting code before reading and writing.

* The writing the compensation data from PROFIBUS is disabled when the auto free fall compensation (setting mode 3-1) setting is "2: ON (communication option OFF)".

○Command No.

For writing data, specify the command No. of the data you want to specify in advance.

The high byte is no used. For command No., see the following list.

Be aware that command No. response and reading data are both adjusted to OFF and the command response is turned ON for invalid command No..

Moreover, when LOCK is activating, it is not possible to write it.

(The command response returns ON.)

Setting value	Command No.	Input range	Each code	Write protected
Upper limit	1	0 to 99999		LOCK1 (soft)
Lower limit	2	0 to 99999		LOCK1 (soft)
Near zero	3	0 to 99999		LOCK1 (soft)
Set point 1	4	0 to 99999	⊙	LOCK1 (soft)
Set point 2	5	0 to 99999	⊙	LOCK1 (soft)
Compensation	6	0 to 9999	⊙	LOCK1 (soft)
Over	7	0 to 9999	⊙	LOCK1 (soft)
Under	8	0 to 9999	⊙	LOCK1 (soft)
Final	9	0 to 99999	⊙	LOCK1 (soft)
Weighing code	10	0 to 7		
Comparison inhibit time	11	0 to 999		LOCK2 (soft)
Judging time	12	0 to 99		LOCK2 (soft)
Complete output time	13	0 to 99		LOCK2 (soft)
Compensation feeding time	14	0 to 999	⊙	LOCK1 (soft)
Auto free fall compensation regulation	15	0 to 99999	⊙	LOCK1 (soft)
Weighing function 1	16	0000 to 2224		LOCK2 (soft)
Weighing function 2	17	00000 to 33121		LOCK2 (soft)
Tare setting	18	0 to 99999		LOCK1 (soft)
Tare display	19	-99999 to 99999		Read only
Setting code	20	0 to 7		
Digital low pass filter	21	0 to 5		LOCK2 (soft)
Moving average filter	22	1 to 512		LOCK2 (soft)
Motion detection ^{*1} (period - range)	23	00-00 to 99-99		LOCK2 (soft), LOCK (SW)
Zero tracking (period)	24	0 to 99		LOCK2 (soft), LOCK (SW)
Zero tracking (range)	25	0 to 9999		LOCK2 (soft), LOCK (SW)
Total comparison selection	26	0 to 2	⊙	LOCK1 (soft)
Total limit (high 4)	27	0 to 9999	⊙	LOCK1 (soft)
Total limit (under 5)	28	0 to 99999	⊙	LOCK1 (soft)
Count limit	29	0 to 9999	⊙	LOCK1 (soft)
Weighing function 3	31	001 to 329		LOCK2 (soft)
Key invalid · LOCK	32	00000 to 11113		
Input selection 1	33	0000 to 8888		LOCK2 (soft)
Input selection 2	34	00 to 88		LOCK2 (soft)
Output selection 1	35	0000 to 9999		LOCK2 (soft)
Output selection 2	36	00 to 99		LOCK2 (soft)
Error output selection	37	00 to 55		LOCK2 (soft)
Reserve output selection ^{*1}	38	00-00 to 21-21		LOCK2 (soft)

Setting value	Command No.	Input range	Each code	Write protected
Bag clamp output time	41	0 to 99		LOCK2 (soft)
Discharging time	42	0 to 99		LOCK2 (soft)
Weighing start time	43	0 to 99		LOCK2 (soft)
AZ times	44	0 to 99		LOCK2 (soft)
Judging times	45	0 to 99		LOCK2 (soft)
Sequence mode 1	46	00000 to 11112		LOCK2 (soft)
Sequence mode 2	47	000 to 111		LOCK2 (soft)
Filling promotion weight	48	0 to 99999		LOCK2 (soft)
Extended function selection 1	51	00000 to 11111		LOCK2 (soft), LOCK (SW)
Extended function selection 2	52	00000 to 11211		LOCK2 (soft), LOCK (SW)
Balance weight value	61	0 to 99999		LOCK2 (soft), LOCK (SW)
Capacity	62	1 to 99999		LOCK2 (soft), LOCK (SW)
Min scale division	63	1 to 50		LOCK2 (soft), LOCK (SW)
DZ regulation value	64	0 to 9999		LOCK2 (soft), LOCK (SW)
Display selection 1	65	00000 to 31447		LOCK2 (soft), LOCK (SW)
Gravitational acceleration	66	97500 to 98500		LOCK2 (soft), LOCK (SW)
Net over	67	0 to 99999		LOCK2 (soft)
Gross over	68	0 to 99999		LOCK2 (soft)
Display selection 2	69	0 to 1		LOCK2 (soft), LOCK (SW)
D/A output mode	77	0 to 3		LOCK2 (soft)
D/A zero output weight	78	0 to 99998		LOCK2 (soft)
D/A full scale value	79	1 to 99999		LOCK2 (soft)
BCD data updata rate	81	0 to 7		LOCK2 (soft)
Equivalent calibration	92	1000 to 32000		LOCK2 (soft), LOCK (SW)
Latest accumulation data	93	0 to 99999		Read only
Accumulation count	94	0 to 9999	⊙	Read only
Accumulation value (high 4)	95	0 to 9999	⊙	Read only
Accumulation value (under 5)	96	0 to 99999	⊙	Read only
Discharge count	97	0 to 99999	⊙	Read only
Total discharge count	98	0 to 199998	⊙	Read only

* Communications, all setting values treats while ignoring the decimal point.

* Settings that are marked with ⊙ in the column of each code, you must specify the setting code (command No.20) before reading and writing.

*1: For command No.23 and No. 38, both reading and writing, to split two settings one word every.

- Command No.23

Motion detection (period)	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	(bit)
																	high order word

Motion detection (range)	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	(bit)
																	low order word

- Command No.38

Reserve output 1	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	(bit)
																	high order word

Reserve output 2	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	(bit)
																	low order word

○Command bit

- Gross weight/Net weight switching display
 - Weight display is switched to net weight by the ON edge.
 - Weight display is switched to gross weight by the OFF edge.
- One-touch tare subtraction Tare subtraction is executed by the ON edge.
- One-touch tare subtraction reset Tare subtraction is reset by the ON edge.
- Digital zero Gross weight is zeroed by the ON edge.
- Digital zero reset Digital zero is reset by the ON edge.
- Hold^{*1} Weight value is held by the ON edge.
Weight value hold is canceled by the OFF edge.
- Accumulation clear Accumulation value on weighing code is cleared by the ON edge.
- Accumulation data all clear Accumulation value on all codes is cleared by the ON edge.
- Accumulation command Accumulate weight values of the current to weighing code in the ON edge.
- Allow operate^{*1} The allow operate signal is made ON-level by the ON edge.
The allow operate signal is made OFF-level by the OFF edge.
- Weighing start^{*1} Given the instruction to weighing start at the ON edge, make the weighing start signal ON-level.
The weighing start signal is made OFF-level by the OFF edge.
- Stop^{*1} Given the instruction to weighing stop at the ON edge, make the stop signal ON-level.
The stop signal is made OFF-level by the OFF edge.
- Discharging command Given the instruction to discharge at the ON edge.
- Manually discharge Given the instruction to manually discharge at the ON edge.
- Open discharge gate^{*1} The open discharge gate signal is made ON-level by the ON edge.
The open discharge gate signal is made OFF-level by the OFF edge.
- Close discharge gate^{*1} The close discharge gate signal is made ON-level by the ON edge.
The close discharge gate signal is made OFF-level by the OFF edge.
- Zero calibration Zero calibration is executed by the ON edge.
- Span calibration
 (actual load calibration) Span calibration (actual load calibration) is executed by the ON edge.
- Span calibration
 (equivalent calibration) Span calibration (equivalent calibration) is executed by the ON edge.
- R/W (R: 1 / W: 0) Specify the command "READ / WRITE".
READ: Turn ON for reading various setting values of the F701-S.
WRITE: Turn OFF for writing setting values to the F701-S.
- Command request Give an ON edge to execute the read or write command.

- "Keep alive" confirmation request

By operating this bit, whether the F701-S is operating normally can be confirmed. The F701-S side outputs this bit to "keep alive" confirmation response as its state is inverted.



Point

*1: These are valid when the priority of level input signal (setting mode 4-7) setting is "1: Communication priority".

IN data (13 words)

F701-S → PLC																DWORD mode			
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	(bit)	mode 0	mode 1
1st word																	Gross weight	(high order)	(low order)
2nd word																	Gross weight	(low order)	(high order)
3rd word																	Net weight	(high order)	(low order)
4th word																	Net weight	(low order)	(high order)
5th word																	Read data	(high order)	(low order)
6th word																	Read data	(low order)	(high order)
7th word	⑩	⑨	⑧	⑦	⑥	⑤	④	③	②				①				Status 1		

- | | |
|------------------------------------|----------------------------|
| ① Sequence error (0 - 9) | ⑥ -LOAD |
| ② Calibration error (0 - 9) | ⑦ OFL2 |
| ③ Calibration processing condition | ⑧ -OFL2 |
| ④ ZALM | ⑨ Final error |
| ⑤ +LOAD | ⑩ Accumulation count error |

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	(bit)
8th word		⑮	⑭	⑬	⑫	⑪	⑩	⑨	⑧	⑦	⑥	⑤	④	③	②	①	Status 2

- | | | |
|----------|----------|--------------------------|
| ① HI LIM | ⑥ SP1 | ⑪ CLAMP |
| ② LO LIM | ⑦ SP2 | ⑫ D.CHG |
| ③ HI | ⑧ SP3 | ⑬ Filling promotion over |
| ④ GO | ⑨ NZ | ⑭ TOTAL LIMIT |
| ⑤ LO | ⑩ COMPL. | ⑮ Discharge count error |

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	(bit)
9th word				⑨	⑧	⑦	⑥	⑤	④	③		②			①		Status 3

- | | |
|--|--|
| ① Decimal place (0: None, 1: 0.0, 2: 0.00, 3: 0.000) | ⑥ NET |
| ② Unit (0: None, 1: t, 2: g, 3: kg, 4: lb) | ⑦ ZT |
| ③ STAB | ⑧ LOCK (SW) |
| ④ HOLD | ⑨ LOCK (setting) |
| ⑤ TARE | (0: Lock1&Lock2 OFF, 1: Lock1 ON Lock2 OFF,
2: Lock1 OFF Lock2 ON, 3: Lock1&Lock2 ON) |

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	(bit)
10th word	⑯	⑮	⑭	⑬	⑫	⑪	⑩	⑨	⑧	⑦	⑥	⑤	④	③	②	①	Command bit response

- | | |
|--|---------------------------------|
| ① Gross weight/Net weight switching display response | ⑨ Accumulation command response |
| ② One-touch tare subtraction response | ⑩ Allow operate response |
| ③ One-touch tare subtraction reset response | ⑪ Weighing start response |
| ④ Digital zero response | ⑫ Stop response |
| ⑤ Digital zero reset response | ⑬ Discharging command response |
| ⑥ Hold response | ⑭ Manually discharge response |
| ⑦ Accumulation clear response | ⑮ Open discharge gate response |
| ⑧ Accumulation data all clear response | ⑯ Close discharge gate response |

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	(bit)
11th word														③	②	①	Command bit response

- | |
|---|
| ① Zero calibration response |
| ② Span calibration (actual load calibration) response |
| ③ Span calibration (equivalent calibration) response |

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	(bit)
12th word																	Command No. response

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	(bit)
13th word													④	③	②	①	Command bit response

- | |
|---|
| ① R/W response |
| ② Command response |
| ③ "Keep alive" confirmation response (The state of the "keep alive" confirmation bit is set as it is inverted.) |
| ④ Remote READY ("1" is set after completion of initialization.) |

■ Explanation about IN data

○ Gross weight (32bit binary / 0 to 99999)

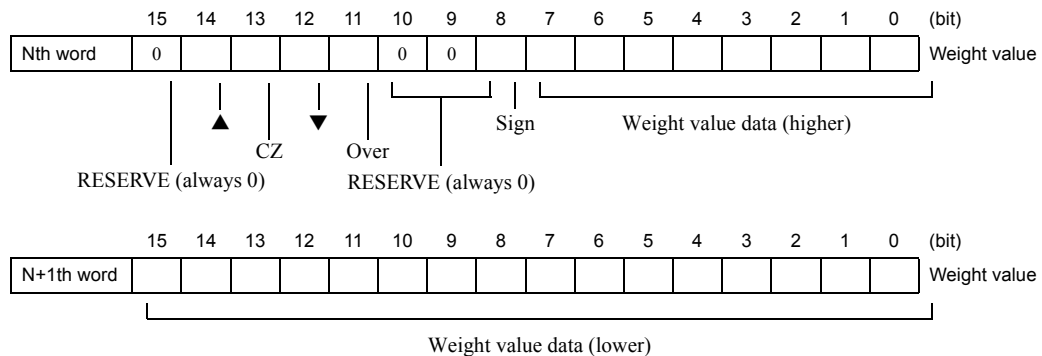
○ Net weight (32bit binary / 0 to 99999)

Indicates gross weight or net weight. As followings, can also be read weight status.

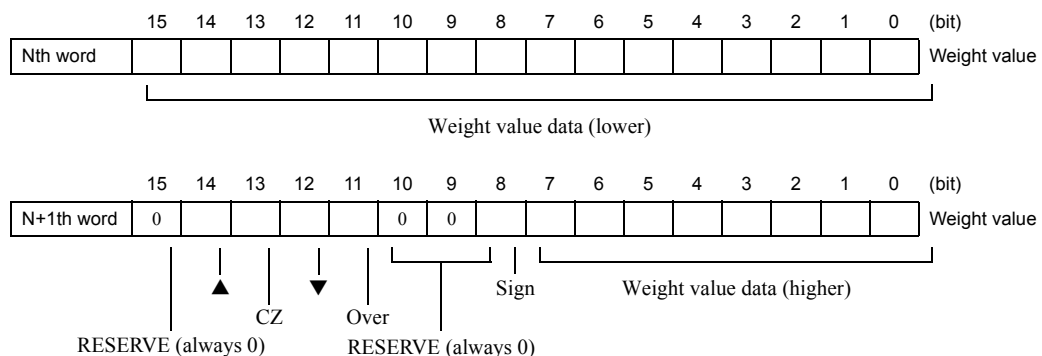
Check the sign in the status of weight. The weight value indicated here is constantly updated. No request signal, etc., is required.

The high order and low order are changed by DWORD mode (setting mode 8-5) of the F701-S.

1) If the DWORD mode is set to mode 0.



2) If the DWORD mode set to mode 1.



- **▲** Turns ON when center point of each instruction scale interval +1/4 scale division. However, 1/4 scale division (setting mode 6-5) must be set to ON in advance.
- **CZ** Turns ON when the true zero point (0 ± 1/4 scale division). However, if set to ON the 1/4 scale division (setting mode 6-5), turns ON at the center point of each instruction scale interval.
- **▼** Turns ON when center point of each instruction scale interval - 1/4 scale division. However, 1/4 scale division (setting mode 6-5) must be set to ON in advance.
- **Over** If the gross weight OVER is "1" when OFL3 (the gross weight > gross over setting value), and if the net weight OVER is "1" when OFL1 (the net weight > net over setting value).
- **Sign** Turns ON when the target weight value is negative.

○Read data (unsigned 32bit binary)

Indicates command No. specified data. The sign does not treat.

However, if run the command No.19 (Tare display), it is the same format as the 1 to 4 words (in this case, over is "tare > 99999"). The data indicated here is updated each time the ON edge of the command request is received. The high order and low order are changed by DWORD mode (setting mode 8-5) of the F701-S.

○Status 1 (error information)

- Sequence error (4bit binary: 0 to 9)
Shows the error No. of the sequence error. "0" means that no sequence error is given.
- Calibration error (4bit binary: 0 to 9)
Shows the error No. of the calibration error. "0" means that no calibration error is given.
- Calibration processing condition
ON during zero calibration or span calibration.
- ZALM
ZALM occurs and turns ON when the total amount of digital zero exceeds the DZ regulation value by digital zero or zero tracking operation.
- +LOAD
Turns ON when a signal beyond the signal input range of the F701-S is inputted.
- -LOAD
Turns ON when a signal below the signal input range of the F701-S is inputted.
- OFL2
Turns ON when the gross weight > (capacity + 9 scale divisions).
- -OFL2
If display selection 2 (setting mode 6-9) set to "0: gross weight < -capacity", turn ON when gross weight < -capacity.
If display selection 2 (setting mode 6-9) set to "1: gross weight < -20 scale divisions", turn ON when gross weight < -20 scale divisions.
- Final error
Turns ON when the final < compensation.
- Accumulation count error
Turns ON when the accumulation count reaches 9999.

○Status 2 (weighing information)

- HI LIM
The timing of comparing will depend on the upper / lower limit comparison mode setting, usually turns ON when the weight value > upper limit setting value.
- LO LIM
The timing of comparing will depend on the upper / lower limit comparison mode setting, usually turns ON when the weight value < lower limit setting value.
- HI
The timing of comparing will depend on the over / under comparison mode setting, usually turns ON when the weight value > (final + over).
- GO
The timing of comparing will depend on the over / under comparison mode setting, usually turns ON when $(\text{final} - \text{under}) \leq \text{weight value} \leq (\text{final} + \text{over})$.
- LO
The timing of comparing will depend on the over / under comparison mode setting, usually turns ON when the weight value < (final - under).
- SP1
During weighing, turns ON when the weight value $\geq (\text{final} - \text{set point 1})$.

- SP2 During weighing, turns ON when the weight value \geq (final - set point 2).
- SP3 During weighing, turns ON when the weight value \geq (final - compensation).
- NZ The timing of comparing will depend on the near zero comparison mode setting, usually turns ON when the weight value \leq near zero.
- COMPL. Turns ON while the complete signal is output.
- CLAMP During weighing, turns ON while the clamp signal is output.
- D.CHG When the weighing mode is sequence mode, turns ON when the discharge during discharging gate control.
- Filling promotion over
 During weighing, turns ON when the weight value \geq filling promotion weight.
- TOTAL LIMIT
 Turns ON while the total limit signal is output.
- Discharge count error
 Turns ON when the discharge count reaches 99999.

○Status 3 (weight information, LOCK condition)

- Decimal place (2bit binary: 0 to 3)
 Shows decimal place (setting mode 6-5) of F701-S.
- Unit (4bit binary: 0 to 4)
 Shows unit (setting mode 6-5) of F701-S.
- STAB Turns ON when the weight value is stable.
- HOLD Turns ON when the weight value is held.
- TARE Turns ON when tare subtraction is performed.
- NET Turns ON while net weight is displayed, and OFF while gross weight is displayed.
- ZT Turns ON when the zero tracking function is working.
- LOCK (SW) Turns ON when the LOCK SW on the real panel is ON, and OFF when the LOCK SW is OFF.
- LOCK (setting) (2bit binary: 0 to 3)
 Shows setting LOCK (setting mode 3-2) of the F701-S.

○Command bit response

- Gross weight/Net weight switching display response
 Returns the same state as "Gross weight / net weight switching display" of OUT data command bit.
- One-touch tare subtraction response
 Turns ON after execution upon receiving the command bit "one-touch tare subtraction".
 Turns OFF after confirming that the command bit "one-touch tare subtraction" is OFF.
- One-touch tare subtraction reset response
 Turns ON after execution upon receiving the command bit "one-touch tare subtraction reset".
 Turns OFF after confirming that the command bit "one-touch tare subtraction reset" is OFF.

- Digital zero response
 - Turns ON after execution upon receiving the command bit "digital zero".
 - Turns OFF after confirming that the command bit "digital zero" is OFF.
- Digital zero reset response
 - Turns ON after execution upon receiving the command bit "digital zero reset".
 - Turns OFF after confirming that the command bit "digital zero reset" is OFF.
- Hold response
 - Returns the same state as "hold" of OUT data command bit.
- Accumulation clear response
 - Turns ON after execution upon receiving the command bit "accumulation clear".
 - Turns OFF after confirming that the command bit "accumulation clear" is OFF.
- Accumulation data all clear response
 - Turns ON after execution upon receiving the command bit "accumulation data all clear".
 - Turns OFF after confirming that the command bit "accumulation data all clear" is OFF.
- Accumulation command response
 - Turns ON after execution upon receiving the command bit "accumulation command".
 - Turns OFF after confirming that the command bit "accumulation command" is OFF.
- Allow operate response
 - Returns the same state as "allow operate" of OUT data command bit.
- Weighing start response
 - Returns the same state as "weighing start" of OUT data command bit.
- Stop response
 - Returns the same state as "stop" of OUT data command bit.
- Discharging command response
 - Turns ON after execution upon receiving the command bit "discharging command".
 - Turns OFF after confirming that the command bit "discharging command" is OFF.
- Manually discharge response
 - Turns ON after execution upon receiving the command bit "manually discharge".
 - Turns OFF after confirming that the command bit "manually discharge" is OFF.
- Open discharge gate response
 - Returns the same state as "open discharge gate" of OUT data command bit.
- Close discharge gate response
 - Returns the same state as "close discharge gate" of OUT data command bit.
- Zero calibration response
 - Turns ON after execution upon receiving the command bit "zero calibration".
 - Turns OFF after confirming that the command bit "zero calibration" is OFF.
- Span calibration (actual load calibration) response
 - Turns ON after execution upon receiving the command bit "span calibration (actual load calibration)".
 - Turns OFF after confirming that the command bit "span calibration (actual load calibration)" is OFF.

- Span calibration (equivalent calibration) response
 - Turns ON after execution upon receiving the command bit "span calibration (equivalent calibration)".
 - Turns OFF after confirming that the command bit "span calibration (equivalent calibration)" is OFF.
- Command No. response
 - Returns the same value as the OUT data command No. when the command response turns ON.
 - The high byte is not used.
- R/W response
 - Returns the same status as R/W of OUT data command bit when the command response turns ON.
- Command response
 - Turns ON upon completion of execution of the read or write command.
 - Turns OFF after confirming that the command request is OFF.
- "Keep alive" confirmation response
 - Constantly outputs the "keep alive" confirmation request as it is inverted.
- Remote READY
 - Turns ON when initialization of the F701-S is finished.

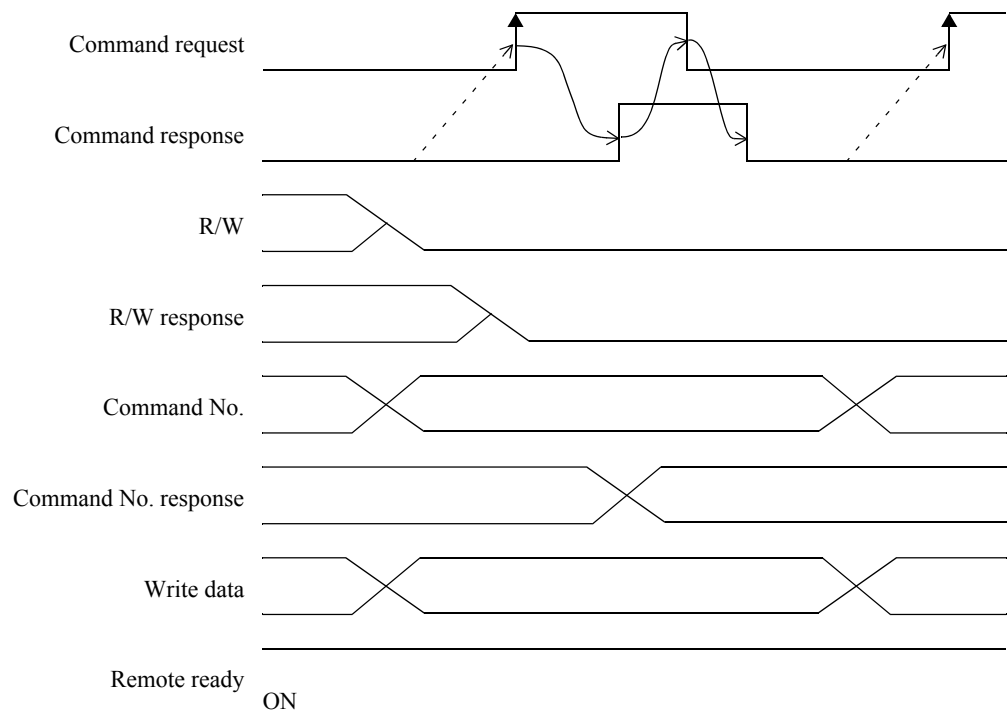
7-6. Read, write, and command procedures

■Write procedure

1. Turn OFF R/W, and specify WRITE.
2. Specify the command No. of the setting value to write.
3. Set data in the write data area.
4. Execute the ON edge of the command request.
5. On the F701-S side, take in the write data, and turn ON the command response.
6. To turn OFF the command request, do it after confirming that the command response is ON.
7. When the command request is turned OFF, the command response also turns OFF.

Attention

- To execute the ON edge of the command request, make sure to do it after confirming that the command request is OFF.
- Immediately after power-on, the remote READY may not be ON. In this case, execute processing after waiting until it becomes ON.

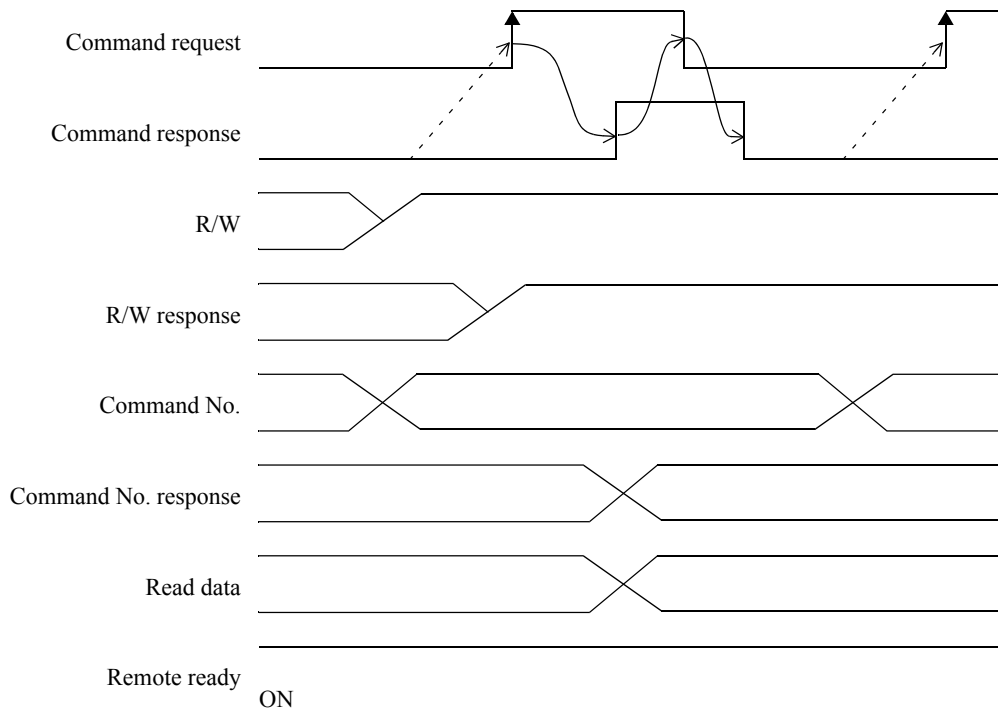


■ Read procedure

1. Turn ON R/W, and specify READ.
2. Specify the command No. of the setting value to read.
3. Execute the ON edge of the command request.
4. On the F701-S side, set the setting value in the read data area, and turn ON the command response.
5. After confirming that the command response is ON, read the data.
6. When the command request is turned OFF, the command response also turns OFF.

Attention

- To execute the ON edge of the command request, make sure to do it after confirming that the command request is OFF.
- Immediately after power-on, the remote READY may not be ON. In this case, execute processing after waiting until it becomes ON.



■ Command procedure

1. Turn OFF each bits of 3rd word and 4th word of OUT data.

However, the command to detect OFF edges and OFF level (hold, allow operate, weighing start, stop, open discharge gate, close discharge gate), please keep the previous state.

Also, if run these commands, the priority of level input signal (setting mode 4-7) must be set to "1: communication priority" in advance.

2. Turn ON the bit of the command to execute.

For the command to detect OFF edges and OFF level, please state level be varied want to be specified.

3. On the F701-S side, and then turn ON the corresponding command bit response.

For the command to detect OFF edges and OFF level, returns the corresponding response to the same state.

4. To immediately turn OFF the command bit, do it after confirming that the response of "3".

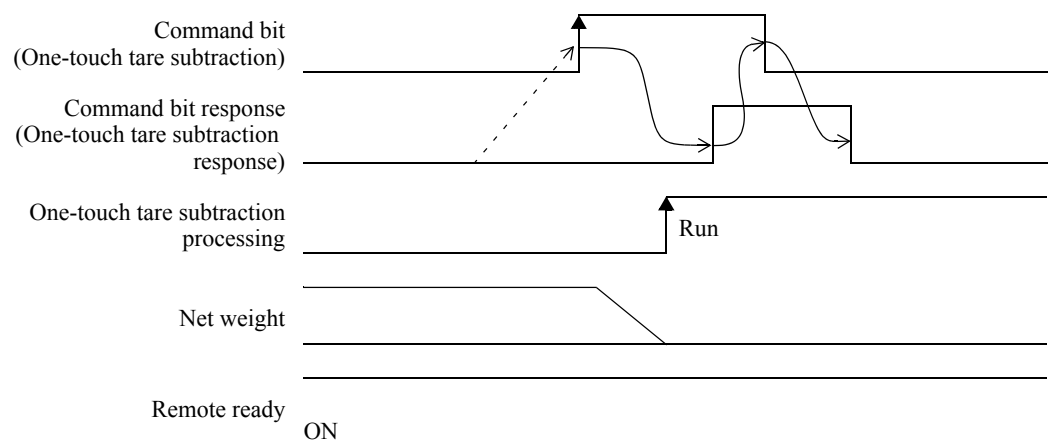
For the command to detect OFF edges and OFF level, must be reset to its previous state is not.

5. When the command bit was returned OFF, the corresponding command bit response also turns OFF.

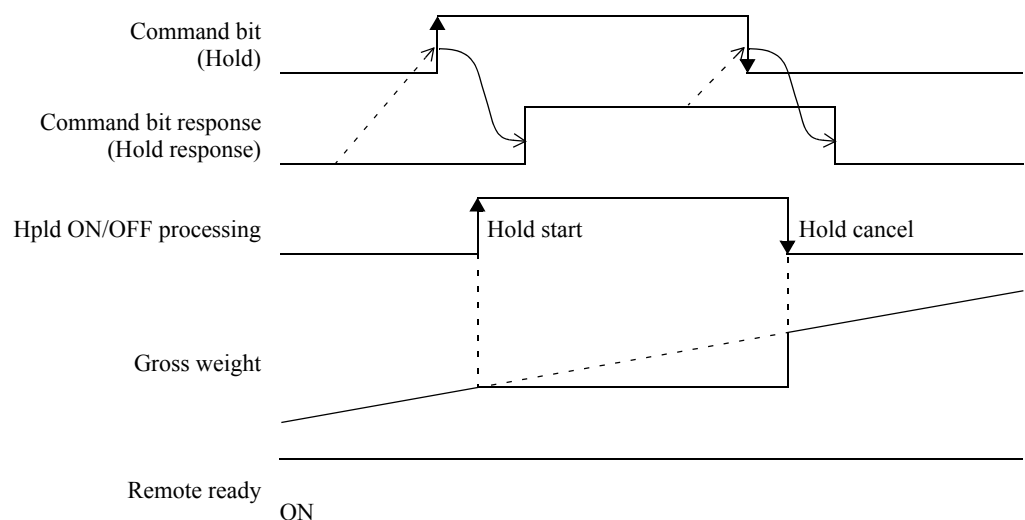
Attention

- If run a directive by command, please change after make sure state of the corresponding response. (If ON level/OFF level of the bits are not change, these directives are not run on the F701-S.)
- Run the directive by command, please follow the instructions to run, do not execute two or more simultaneously.
- Immediately after power-on, the remote READY may not be ON. In this case, execute processing after waiting until it becomes ON.

Example 1) Execution of the command bit of one-touch tare subtraction.



Example 2) Gives ON edge to the command of hold, then cancel the hold given the OFF edge.



M E M O

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....