

A-Series

(PROFIBUS-DP)

Operation Manual



-	A-Series Profibus Operation Manual	2022-6-1	Kawamoto	—	Mori
Rev.No.	Description	Date (yy-mm-dd)	Prepared	Checked	Approved
SEIBU ELECTRIC & MACHINERY CO.,LTD.			ELECTRIC ACTUATOR DIVISION		

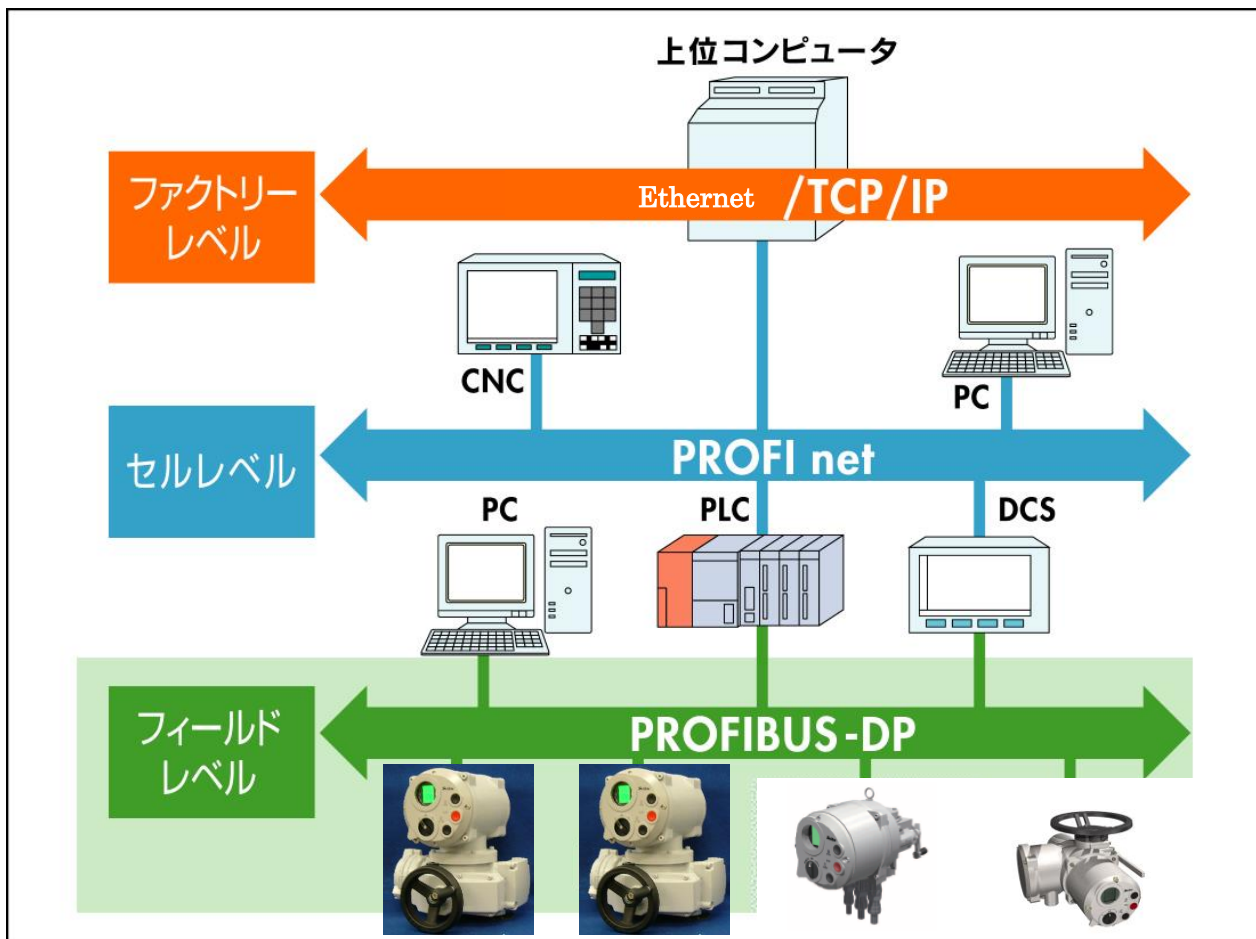
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1) Outline

PROFIBUS-DP communication unit (PROFIDP-BRG) is a communication unit for PROFIBUS-DP that is suitable for Seibu valve controller. (For V-series)

PROFIBUS is an open field bus communication system that is extensively used for factory automation process. (Global standard IEC61158 certification)



2) *Specification*

Please refer to Profibus official manual for specification not listed below.

Technical data:General data PROFIBUS – DP

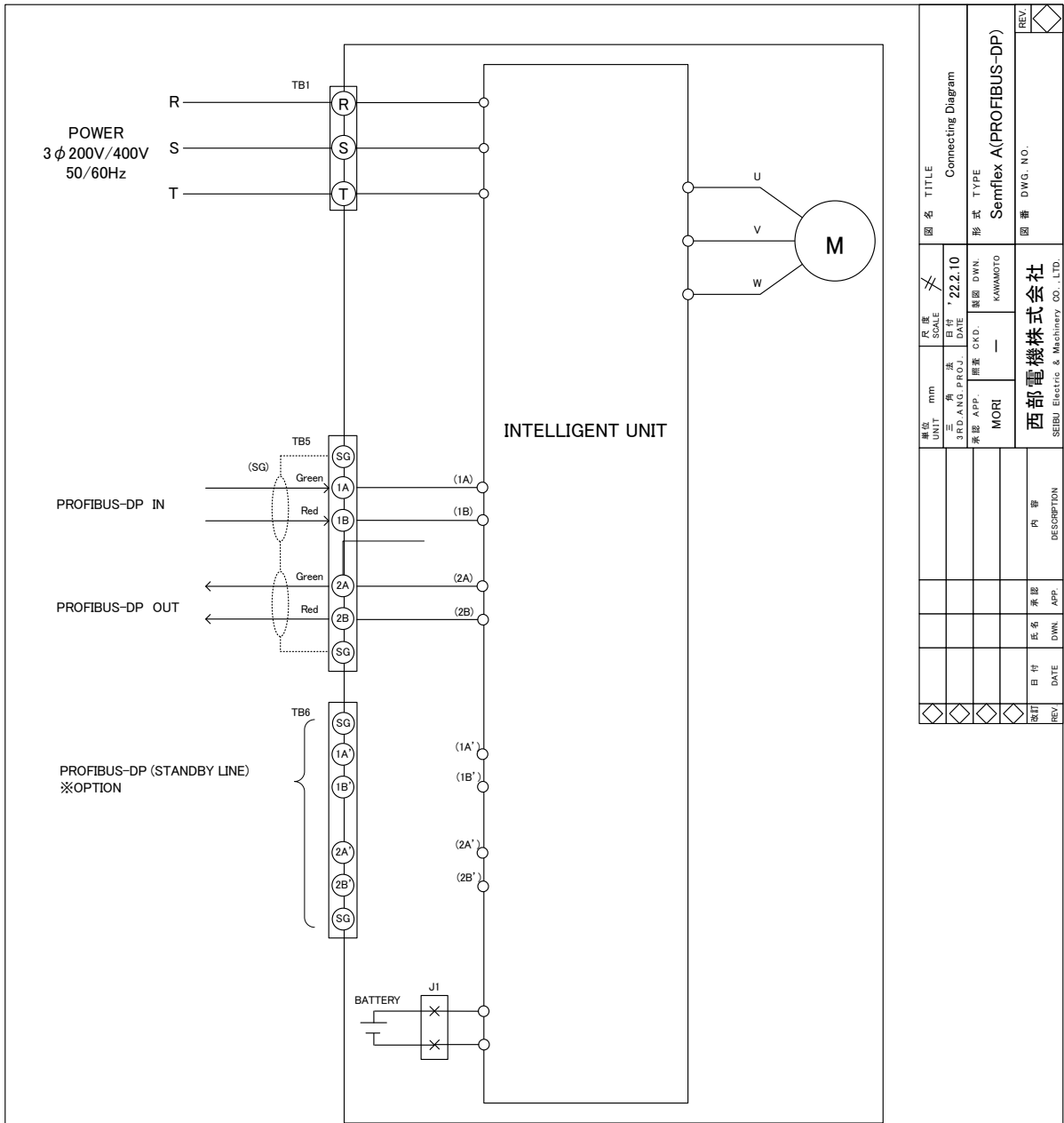
Communication protocol	PROFIBUS-DP	
Interface	RS-485	
Transmission rate / Cable length	Baud rate (kbit/s)	Cable length (without repeater)
	9.6	1200m
	19.2	1200m
	93.75	1200m
	187.5	1000m
	500	400m
	1500	200m
12000	100m	
Transmission Wiring	Twist pair cable (SIEMENS : 6XV1830-0EH10)	
Station Type	DP Master class 1 DP Master class 2 DP slave	
Number of stations	32 stations without repeater, with repeater expandable up to 125	
Communication setting	Data : 8bit Parity : Odd number Stop bit : 1bit	
Encoding method	Non Return to Zero	

Data of actuator controls (A) series with PROFIBUS – DP interface:

Electronic controls	Integral controls Seibu Semflex – series
Baud rate recognition	Automatic
Command signals	OPEN STOP CLOSE Proportion control : Option
Feedback signals	Limit switch OPEN/CLOSE Torque switch OPEN/CLOSE Opening/Closing signals Position REMOTE Valve position (Option) Self diagnosis data (Option)
Fault signals	1.Motor protection tripped 2.Torque abnormal 3.Other abnormal

3) Wiring Diagram

<Semflex-A>



単位 UNIT	mm	尺 SCALE	図名 TITLE
三 角 法 3RD-ANG-PROJ.	日付 DATE	22.2.10	接続図 Connecting Diagram
承認 承認 APP.	照査 照査 CKD.	—	形式 形式 TYPE
MORI	製図 製図 DWN.	KAWAMOTO	Semflex A(PROFIBUS-DP)
社内 社内	氏名 氏名 DWN.	西 西	図番 図番 DWG. NO.
日付 日付	REV	SEIBU Electric & Machinery CO., LTD.	REV

(Semflex-A)

- SW1「SKIP」

Switching connection and disconnection with the internal INTELLIGENT UNIT of MAIN LINE.

NORMAL(usually) : Connecting with the internal INTELLIGENT UNIT

SKIP : Disconnecting with the internal INTELLIGENT UNIT
- SW2「Termination resistor」

Switching MAIN LINE termination resistor ON/OFF.

ON : Termination resistor = ON

OFF(usually) : Termination resistor = OFF
- SW3「SKIP」(※option)

Switching connection and disconnection with the internal INTELLIGENT UNIT of STANDBY LINE.

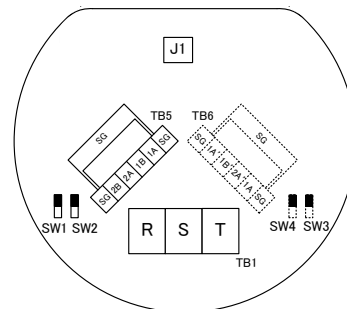
NORMAL(usually) : Connecting with the internal INTELLIGENT UNIT

SKIP : Disconnecting with the internal INTELLIGENT UNIT
- SW4「Termination resistor」(※option)

Switching STANDBY LINE termination resistor ON/OFF.

ON : Termination resistor = ON

OFF(usually) : Termination resistor = OFF



4) PROFIBUS Cable Connection

■ Connecting Cable

Connecting cable for PROFIBUS, which Seibu recommend is following models.

Refer to Siemens or Fujikura related manual for cable specification, connecting method and so on.

Maker	Model
Siemens	6XV1830-0EH10
Fujikura	F-LINK-P

■ Recommended Bus Connector

It is recommended to use connector called "bus connector" on RS-485 as PROFIBUS connecting cable. PROFIBUS cable is easily connected by using this connector.

Recommended bus connector is listed as below.

Refer to Siemens or Phoenix Contact related manual for connector specification, connecting method and so on.

Maker	Model
Siemens	6ES7 972-0BA11-0XA0
	6ES7 972-0BB11-0XA0
	6ES7 972-0BA40-0XA0
	6ES7 972-0BB40-0XA0
	6ES7 972-0BA50-0XA0
	6ES7 972-0BB50-0XA0
Phoenix Contact	SUBCON-PLUS-PROFIB/PG/SC2

5) Electric Unit Environmental Performance

Ambient temperature	-5°C~80°C	
Relative humidity	RH 45~95%	
Vibration-resistance	50Hz/10G 1hr	(JIS C 0040)
Impact-resistance	30G/11ms X,Y,Z Each 3 time	(JIS C 0041)
Noise-resistance	INPULS±2000V clear	(IEC61000-4-4)
Static electricity	contact±8kv In the air±15kv	(IEC61000-4-2)
Surge (Thunder)	4kV (1.2/50 μ s) Protection	(IEC61000-4-5)
Conductive disturbance	10V/m clear	(IEC61000-4-6)
Electric wave noise	10V/m clear	(IEC61000-4-3)

6) Interface Specification

• Profibus communication port

Item	Specification
Signal level	RS-485
Baud rate	Max 12Mbps
Parity	Even number
Data length	8Bit
Stop bit	1Bit
Connector	D-Sub 9 pin

• Screw connecting type plug allocation (Terminal block board side)

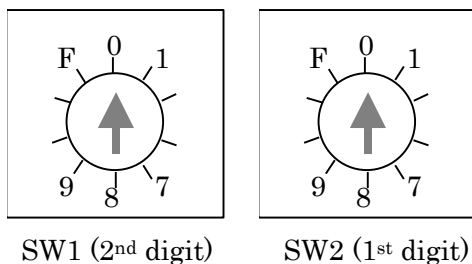
< Semflex-VM >

Communication	Terminal block	Terminal No. (Signal Name)	I/O
MAIN	TB7	1A	IN
		1B	
	TB8	2A	OUT
		2B	
STANDBY	TB11	1A'	IN
		1B'	
	TB12	2A'	OUT
		2B'	

< Semflex-VP >

Communication	Terminal block	Terminal No. (Signal Name)	I/O
MAIN	TB6	1A	IN
		1B	
	TB6	2A	OUT
		2B	
STANDBY	TB5	1A'	IN
		1B'	
		2A'	OUT

• Rotary Switch (SW1, SW2) (Built-in type board switch)

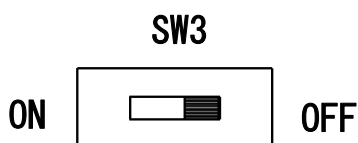


Item	Specification
SW2	Network address high order byte of PROFIBUS(7~F)
SW3	Network address low order byte of PROFIBUS(0~F)

* Setting range is 01 to 7D

*Address setting is 1 to 125

• Sliding Switch (SW3) (Users can NOT use)



Set the switch at R83 side (OFF side. Set by Seibu)

*Does not work properly when set to LED3 side.

• LED

	Status Specification
LED1	Status of MAIN LINE ON : Normal, OFF : Not communicating
LED2	Status of STAND BY ON : Normal, OFF : Not communicating
LED3	PROFIBUS Power status ON : MAIN and STANDBY Power is ON Flashing : MAIN or STANDBY Powe is ON OFF : Power is OFF

7) *Transmission contents*

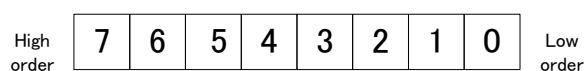
The contents transmitted from our communication unit are as follows..

Updating speed 9600bps, 15byte IN, 15byte OUT

<Input>			<Output>		
Item	Contents	Data length	Item	Contents	Data length
1	Command Signal	8bit	1	Status Display Signal	8bit
2	Position Command Signal (0~100) % Lower	8bit	2	Position Signal (0~100) % Low order	8bit
3	Reset Signal	8bit	3	Position Signal (0~100) % High order	8bit
4	Position Command Signal (0~100) % Upper	8bit	4	Abnormal Signal	8bit
5	Error signal (Smart type)	8bit	5	No. of activations *Lowest order	8bit
6	Blank	8bit	6	No. of activations *Low order	8bit
7	Blank	8bit	7	No. of activations *High order	8bit
8	Blank	8bit	8	No. of activations *Highest order	8bit
9	Blank	8bit	9	Opening Current Max hold value	8bit
10	Blank	8bit	10	Closing Current Max hold value	8bit
11	Blank	8bit	11	Opening Torque Max hold value	8bit
12	Blank	8bit	12	Closing Torque Max hold value	8bit
13	Blank	8bit	13	Opening Torque value	8bit
14	Blank	8bit	14	Closing Torque value	8bit
15	Blank	8bit	15	Torque scale, Emergency upper limit	8bit

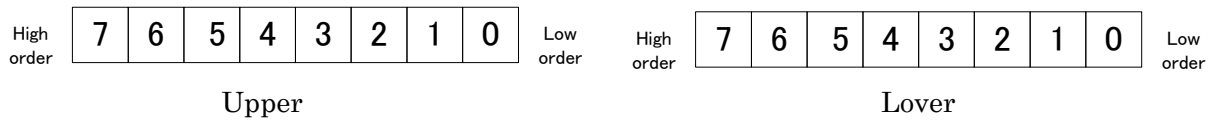
8) *Bit MAP*

Input) Item No.1 : Command Signal (Active=1)

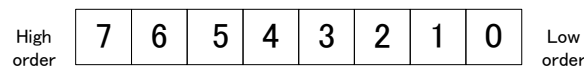


- | | |
|--|-----------------------------------|
| 0bit : Open | (1 shot or Continuous signal) |
| 1bit : Close | (1 shot or Continuous signal) |
| 2bit : Stop | (1 shot or Continuous signal) |
| 3bit : Proportional control | (Continuous signal) |
| 4bit : Maintenance | (Display maintenance sign on LCD) |
| 5bit : Maintenance (Important valve) | (Flashing full open lamp) |
| 6bit : Emergency upper limit | (Continuous signal) |
| 7bit : Position command accuracy selection | (Continuous signal) |

※Command priority : Maintenance > Emergency Upper Limit > Proportional control > Stop > Close=Open

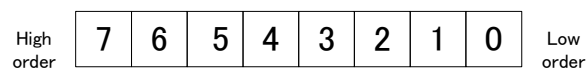
Input) Item No.2 & 4: Position Command Signal (0-100)% Upper/Lower every 0.1% (0~3E8)

With Proportional Control, positioning command in every 0.1% from 0.0 to 100.0% is possible.

Input) Item No.3: Reset Signal (Active=1)

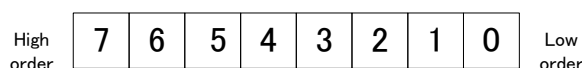
Reset Self-Diagnostic data, Starting current / Starting torque Max holding value.

- 0bit : Starting current reset (1 shot signal)
- 1bit : Starting torque reset (1 shot signal)
- 2bit : Number of activation (1 shot signal)
- 3bit : Blank
- 4bit : Blank
- 5bit : Blank
- 6bit : Blank
- 7bit : Blank

Input) Item No.5: Error Signal (Active=1)

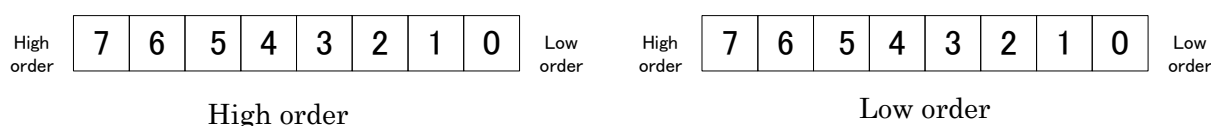
*Communication content with gateway board dedicated to smart valves (not used in PROFIBUS)

- 0bit : Pressure Sensor Error (Continuous Signal)
- 1bit : Device Error (Continuous Signal)
- 2bit : Pressure Drop (Continuous Signal)
- 3bit : Blank
- 4bit : Blank
- 5bit : Blank
- 6bit : Blank
- 7bit : Blank

Output) Item No.1 : Status Display Signal (Active=1)

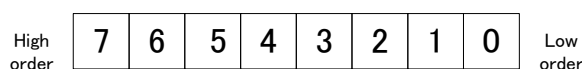
Display the status of valve actuator

0bit : Fully Open Limit	(Continuous signal on fully open limit operation)
1bit : Fully Closed Limit	(Continuous signal on fully closed limit operation)
2bit : Opening	(Continuous signal on opening operation)
3bit : Closing	(Continuous signal on closing operation)
4bit : Open Torque Limit	(Continuous signal on open torque limit operation)
5bit : Close Torque Limit	(Continuous signal on close torque limit operation)
6bit : Remote operation mode	(Continuous signal on remote operation, Local/OFF=0)
7bit : Local operation mode	(Continuous signal on local operation, Remote/OFF=0)

Output) Item No.2,3: Position Signal (0~100) % High/Low every 0.1% (0~3E8)

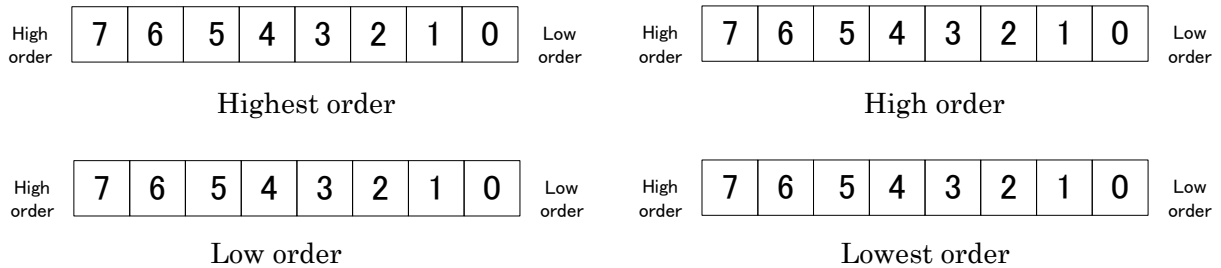
Output the position signal of actuator every 0.1%, 0 to 100% (HEX 0 to 3EB.)

*Setting for every 0.1% is an electrical characteristic and hysteresis occurs due to the backlash in the mechanical mechanism.

Output) Item No.4: Abnormal Signal (Active=1)

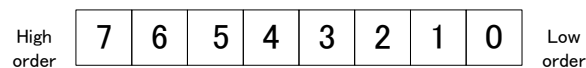
Display abnormal status of actuator.

0bit : Thermal error	(Continuous signal at thermal abnormality) E03,E13
1bit : Overcurrent error	(Continuous signal) E09
2bit : Overvoltage error	(Continuous signal) E10
3bit : Motor rotation error	(Continuous signal when idling motor) E02,E11,E12
4bit : Blackout on operation	(Continuous signal at blackout while operation) E01
5bit : Driver error	(Continuous signal) A01~A05,E04, ,E14
6bit : Buttery error	(Continuous signal) E08,E15
7bit : Profibus Card error	(Continuous signal at Profibus Card abnormality) E06,E07,E16,E17

Output) Item No.5,6,7,8 : Number of activations 0 to 5 Million (HEX 0 to 4C4B40)

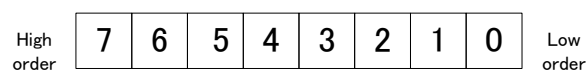
Output the number of activations of magnet conductor (reversible device) in actuator.

Output to the master machine as maintenance information for the reversible device (Able to reset with a reset signal)

Output) Item No.9 : Opening Motor Current Max Hold value, 0.0~25.0A output every 0.1A (0~FA)

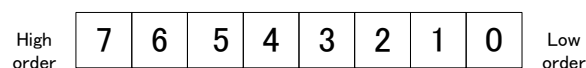
Output starting current Max value of actuator to opening direction every 0.1A in 0.0 to 25.0A (HEX0 to FA).

* Always output Max value and observe secular variation (Able to reset by reset signal)

Output) Item No.10 : Closing Motor Current Max Hold value, 0.0~25.0A output every 0.1A (0~FA)

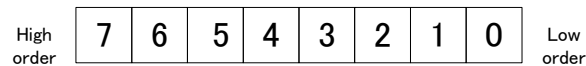
Output starting current Max value of actuator to closing direction every 0.1A in 0.0 to 25.0A (HEX0 to FA).

* Always output Max value and observe secular variation (Able to reset by reset signal)

Output) Item No.11 : Opening Torque Max Hold value, 0~255 output upper 3 digits (0~FF)

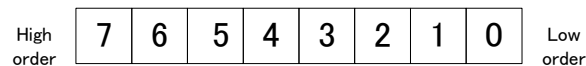
Output starting torque Max value of actuator to opening direction in 0 to 255, upper 3 digits .

* Always output Max value and observe secular variation (Able to reset by reset signal)

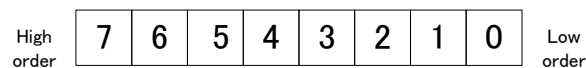
Output) Item No.12 : Closing Torque Max Hold value, 0~255 output upper 3 digits (0~FF)

Output starting torque Max value of actuator to closing direction in 0 to 255, upper 3 digits.

* Always output Max value and observe secular variation (Able to reset by reset signal)

Output) Item No.13 : Opening Torque value, 0~255, Output upper 3 digits (0~FF)

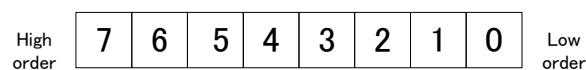
Output torque value of actuator to opening direction in 0 to 255, upper 3 digits .

Output) Item No.14 : Closing Torque value, 0~255, Output upper 3 digits (0~FF)

Output torque value of actuator to closing direction in 0 to 255, upper 3 digits .

Ex.) When output 150Nm, output 150

When output 1,800Nm, output 180

Output) Item No.15: Torque scale, Emergency Upper Limit (Active=1)

- 0bit : Torque scale E1 (Torque value x 10)
- 1bit : Torque scale E2 (Torque value x 100)
- 2bit : Torque scale E4 (Torque value x 10000)
- 3bit : Interlocking (Continuous signal during interlocking)
- 4bit : Emergency operation (Continuous signal during emergency operation)
- 5bit : Emergency upper limit (Continuous signal during emergency upper limit)
- 6bit : Proportional control (Continuous signal during Proportional control)
- 7bit : Blank

9) GSD ファイル

<Semflex-A>

; =====

; GSD-File for Seibu PROFIBUS UNIT (Type:PROFIDP-TBA-01)

; Profibus-Module 1-channel, max. 12MBaud

;

; File name : SEIB102D.GSD

; Version 1.0 Dec. 5, 2017

; =====

;

#Profibus_DP

GSD_Revision = 1

Vendor_Name = "Seibu"

Model_Name = "PROFIDP-TBA-01"

Revision = "1.00"

Ident_Number=0x102D

Protocol_Ident = 0 ; 0 = PROFIBUS-DP

Station_Type = 0 ; 0 = DP-Slave

FMS_supp = 0 ; 0 = NOT FMS

Hardware_Release = "A1.0"

Software_Release = "Z1.0"

9.6_supp = 1

19.2_supp = 1

93.75_supp = 1

187.5_supp = 1

500_supp = 1

1.5M_supp = 1

3M_supp = 1

6M_supp = 1

12M_supp = 1

MaxTsdr_9.6 = 15

MaxTsdr_19.2 = 15

MaxTsdr_93.75 = 15

MaxTsdr_187.5 = 15

MaxTsdr_500 = 15

MaxTsdr_1.5M = 25

MaxTsdr_3M = 50

MaxTsdr_6M = 100

MaxTsdr_12M = 200

```
Redundancy=0
Repeater_Ctrl_Sig=1
Implementation_Type="SPC3"
Bitmap_Device="Seibu_A"
; Slave-Specification:
Freeze_Mode_supp      = 1
Sync_Mode_supp        = 1
Auto_Baud_supp        = 1
Set_Slave_Add_Supp=0
Fail_Safe=1
Min_Slave_Intervall   = 1
Max_Diag_Data_Len     = 6
Modul_Offset          = 1
Slave_Family          = 3           ;I/O
Modular_Station=1
Max_Module             = 1
Max_Input_Len         = 16
Max_Output_Len        = 16
Max_Data_Len          = 32
User_Prm_Data_Len     = 0
; Module-Definition-List
Module = "16DI/DO" 0x3F
EndModule
```