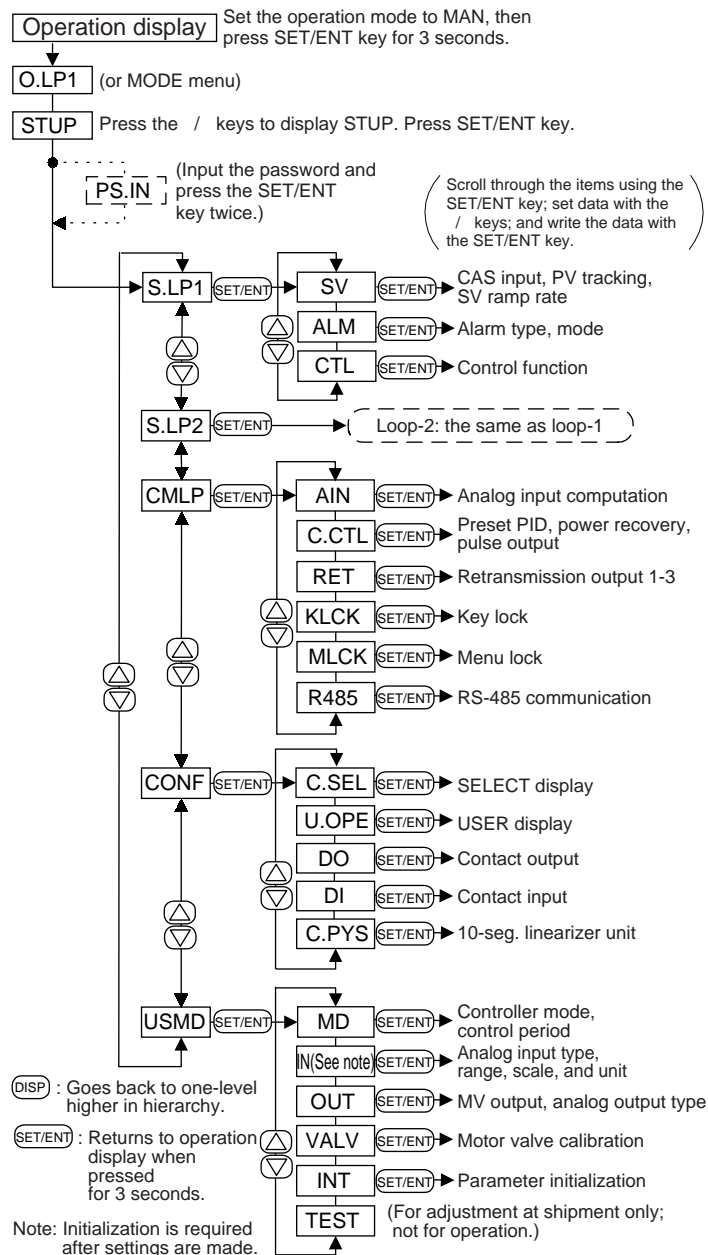## Setup Parameters (for building functions)

IM 5D1A01-81E 1st Edition Oct. 1998

Setup parameters are used to configure controller functions and cannot be changed during operation. (You must stop the control to change setup parameters.)

| Operation display | Set the operation mode to MAN, then press SET/ENT key for 3 seconds. |

O.LP1 (or MODE menu)

STUP Press the / keys to display STUP. Press SET/ENT key.

PS.IN (Input the password and press the SET/ENT key twice.)

Scroll through the items using the SET/ENT key; set data with the / keys; and write the data with the SET/ENT key.

S.LP1 [SET/ENT] → SV [SET/ENT] → CAS input, PV tracking, SV ramp rate
ALM [SET/ENT] → Alarm type, mode
CTL [SET/ENT] → Control function

S.LP2 [SET/ENT] → (Loop-2: the same as loop-1)

CMLP [SET/ENT] → AIN [SET/ENT] → Analog input computation
C.CTL [SET/ENT] → Preset PID, power recovery, pulse output
RET [SET/ENT] → Retransmission output 1-3
KLCK [SET/ENT] → Key lock
MLCK [SET/ENT] → Menu lock
R485 [SET/ENT] → RS-485 communication

CONF [SET/ENT] → C.SEL [SET/ENT] → SELECT display
U.OPE [SET/ENT] → USER display
DO [SET/ENT] → Contact output
DI [SET/ENT] → Contact input
C.PYS [SET/ENT] → 10-seg. linearizer unit

USMD [SET/ENT] → MD [SET/ENT] → Controller mode, control period
IN(See note) [SET/ENT] → Analog input type, range, scale, and unit
OUT [SET/ENT] → MV output, analog output type
VALV [SET/ENT] → Motor valve calibration
INT [SET/ENT] → Parameter initialization
TEST (For adjustment at shipment only; not for operation.)

(DISP) : Goes back to one-level higher in hierarchy.

(SET/ENT) : Returns to operation display when pressed for 3 seconds.

Note: Initialization is required after settings are made.

■ Setup Parameter List

Parameters marked with an asterisk (*): Be sure to check (and change) the settings.
Other parameters: Use their default settings for general use, and change as necessary.

Code	Description	Setting range	Default
SV			
CMS	Cascade input selection	AIN = analog input, CPT = communication	AIN
PVT	PV tracking selection	OFF, ON	OFF
TMU	Time unit for ramp-rate setting	0 = 1 hour, 1 = 1 minute	0
DVB	Deviation display range	EUS(0.0 to 100%)	EUS(1.65%)
ALM			
* AL1	Alarm 1 type	OFF, 1 to 29 (PV high limit = 1, PV low limit = 2. See the table overleaf for other alarms.)	1= PV high
* AL2	Alarm 2 type		2= PV low
* AL3	Alarm 3 type		1= PV high
* AL4	Alarm 4 type		2= PV low
HY1 - HY4	Alarm 1 to 4 hysteresis	MV alarm: 0 to 100.0%, EUS(0.0 to 100.0%)	EUS or MV alarm 0.5%
PVR.T	PV velocity alarm duration time	1 to 9999 seconds	1 second
AMD	Alarm mode	0 = Always enabled, 1 to 5	0
CTL			
MVR	Output velocity limiter	OFF, 0.1 to 100.0% per second	OFF
* MOD	PID control mode	0 = batch, 1 = fixed point	1
AR	Anti-reset windup	AUTO, 50.0 to 200.0%	AUTO
FFS	Feedforward input selection	OFF = disabled, AIN = analog input	OFF
AIN			
A.BS1	Analog Input-1(AIN1)bias	EUS(-100.0 to 100.0%)	EUS(0.0%)
A.FL1	AIN1 filter	OFF, 1 to 120 seconds	OFF
A.SR1	AIN1 square-root computation	OFF, ON	OFF
A.LC1	AIN1 square-root low signal cutoff	0.0 to 5.0%	1.0%
A.BO1	AIN1 burnout action	OFF, UPS, DNS	OFF
A.RJ1	AIN1 reference junction compensation	OFF, ON	OFF
A.BS2 to A.RJ2: Parameters for analog input-2 (the same as for AIN1)			
A.BS3 to A.BO3: Parameters for analog input-3 (the same as for AIN1), but without RJ			
C.CTL			
PPID	Preset PID function selection	0 = disabled, 1 = SV no., 2 = zone PID	0
R.MD	Restart mode (upon power recovery for power failures of no less than 2 seconds)	HOT = continues the operation prior to power failure, COLD = starts in MAN mode	COLD
R.TM	Restart timer	0 to 60 seconds	0 seconds
* CT1, 2	Cycle time of MV1, MV2	1 to 1000 seconds	30 seconds
CTc1, 2	Cycle time of cooling-side MV1, MV2	1 to 1000 seconds	30 seconds
RET			
RET1	Retransmission output-1 type	OFF=disabled,1=PV1, 2=SV1, 3=MV1, 4=PV2, 5=SV2, 6=MV2	3=(MV1)
RTH1	Max. value of retransmission output-1 scale	RTL1<RTH1(EU(100.0%)	100.0

Code	Description	Setting range	Default
RTL1	Min. value of retransmission output-1 scale	EU(0.0%)(RTL1<RTH1	0.0
RET2	Retransmission output-2 type	OFF=disabled, 1 to 6	2=(SV1)
RTH2, RTL2	Max./min. values of retransmission output-2 scale	The same as RTH1 and RTL1	P.RL to P.RH
* RET3	Retransmission output-3 type	OFF=disabled, 1 to 6	1=(PV1)
RTH3, RTL3	Max/min values of retransmission output-3 scale	The same as for RTH1 andRTL1	P.RL to P.RH

KLCK

Code	Description	Setting range	Default
SVC	SV setting keylock	OFF, ON	OFF
/	Data setting keylock	OFF, ON	OFF
< / >	MV operation keylock	OFF, ON	OFF
C	CAS mode keylock	OFF, ON	ON
A	AUTO mode keylock	OFF, ON	OFF
M	MAN mode keylock	OFF, ON	OFF

MLCK

Code	Description	Setting range	Default
MODE	MODE menu lock	OFF, ON	OFF
O.LP1	O.LP1 menu lock	OFF, ON	OFF
O.LP2	O.LP2 menu lock	OFF, ON	OFF
PID	PID menu lock	OFF, ON	OFF
USR	USR menu lock	OFF, ON	OFF
PYS1, PYS2	PYS1/2 menu lock	OFF, ON	OFF
PWD	Password setting	0 = no password, 1 to 30000	0

R485

Code	Description	Setting range	Default
PSL	Protocol selection	0 = MODBUS(ASCII), 1 = MODBUS(RTU), 2 = PC-link communication 3 = As above (but with sum check)	0
BPS	Baud rate	600 to 38400bps	9600
PARI	Parity	N = none, E = even, O = odd	E
STP	Stop bit	1, 2	1
DLN	Data length	7, 8	8
ADR	Controller address	1 to 99	1
RSP.T	Minimum response time	0 to 10 (x 10ms)	0

C.SEL and U.OPE

Code	Description	Setting range	Default
C.S1 - C.S5	Registration for the SELECT display 1 to 5	OFF, 201 to 773	OFF
U.1AL	USER display of loop-1 alarm	OFF, ON	OFF
U.2AL	USER display of loop-2 alarm	OFF, ON	OFF
U.SVN	USER display of SV number	OFF, ON	OFF
U.1PI	USER display of loop-1 PID group No.	OFF, ON	OFF
U.2PI	USER display of loop-2 PID group No.	OFF, ON	OFF
U.AI1 - 3	USER display of AIN1 to 3 measured values	OFF, ON	OFF
U.PV1 - 2	USER display of PV1, 2	OFF, ON	OFF
U.SMP	USER display of sampling error counter	OFF, ON	OFF

DO

Code	Description	Setting range	Default
DO1 - DO7	Output flag registration for DO1 to 7	(Refer to the instruction manual)IM5D1A01-01E	

DI

Code	Description	Setting range	Default
CAS1	Loop-1 mode switchover to CAS	Set the I-relay number of the contact input to be connected. DI1= 5161, DI2= 5162 DI3= 5163, DI4= 5164 DI5= 5165, DI6= 5166 DI7= 5167	Depends upon the mode of the controller.
AUT1	Loop-1 mode switchover to AUTO		
MAN1	Loop-1 mode switchover to MAN		
CAS2 - MAN2	Loop-2 mode switchover to CAS/AUTO/MAN		
O/C	Open/Close switchover of internal cascade loop		
R/S	RUN/STOP switchover		
TRF1, TRF2	Loop-1,2 tracking flags		
SV.B0 - SV.B3	Bit 0-3 of SV number setting		
DP1, DP2	Operation display for interruption 1, 2		
MG1 - MG4	Message interruption display 1 to 4		

C.PYS

Code	Description	Setting range	Default
PY1X	10- segment linearizer-1 input unit	0 to 15 12=EU(PV1), 13=EUS(PV1) 14=EU(PV2), 15=EUS(PV2)	12
PY1Y	10- segment linearizer-1 output unit		13
PY2X, PY2Y	10- segment linearizer-2 input/output unit		14/15

MD

Code	Description	Setting range	Default
* USM	Controller mode (US mode)	1 to 21 (See "Controller Mode (USMD-MD) and ApplicableController Type."	1
SMP	Control period	50, 100, 200, 500 ms	200

IN

Code	Description	Setting range	Default
* TYP1	Analog input-1 (AIN1) type	1 to 56 (See "Analog Input Type List (for setting IN-TYPn).")	41
* UNT1	AIN1 unit	˚C (Celsius),˚ F (Fahrenheit)	˚C
* RH1	Max. value of AIN1 range	Within instrument range	Max. value of instrument range
* RL1	Min. value of AIN1 range	Within instrument range	Min. value of instrument range
* SDP1	AIN1 decimal point position	0 to 4	1
* SH1	Max. value of AIN1 scale	-19999 to 30000	100.0
* SL1	Min. value of AIN1 scale	-19999 to 30000	0.0
TYP2 to SL2 : Parameters for analog input-2 (the same as AIN1 parameters)			
TYP3 to SL3 : Parameters for analog input-3 (the same as AIN1 parameters except for the unit)			
P.DP1**	PV1 decimal point position	0 to 4	1
P.RH1**	Max. value of PV1 range	-19999 to 30000	100.0
P.RL1**	Min. value of PV1 range	-19999 to 30000	0.0
P.DP2, P.RH2, P.RL2: Parameters for PV2 (the same as PV1 parameters)			
** P.DPn, P.RHn, P.RLn are used for loop control with PV switching/auto-selector.			

OUT

Code	Description	Setting range	Default
* MVS1, * MVS2	MV1, MV2 selection	1 to 12 (See "MV Output Types (for setting OUT-MVS1,MVS2).") 2 = current	2
AO1 - AO3	Analog output 1/2/3 type	0 = 4 to 20 mA, 1 = 0 to 20 mA, 2 = 20 to 4 mA, 3 = 20 to 0 mA	0
RVOP	Reverse display and operation of MV	OFF, ON	OFF

VALV (US1000-21 only)

Code	Description	Setting range	Default
V.RS	Reset valve position	0 = normal position, 1 = reset position data	0
V.L	Valve in fully-closed position	Close the valve completely using the key, then press SET/ENT to save the position.	
V.H	Valve in fully-opened position	Open the valve completely using the key, then press SET/ENT to save the position.	
V.AT	Auto-calibration for valve positioning	OFF, ON	OFF

INT

Code	Description	Setting range	Default
* INIT	Parameter initialization	OFF, ON	OFF

■ Analog Input Type List (for setting IN-TYPn)

Type		Setting	Range (˚C)			Range (˚F)		
Thermocouple	K	1	-270.0	to	1370.0 ˚C	-450.0	to	2500.0 ˚F
		2	-270.0	to	1000.0 ˚C	-450.0	to	2300.0 ˚F
		3	-200.0	to	500.0 ˚C	-200.0	to	1000.0 ˚F
	J	4	-200.0	to	1200.0 ˚C	-300.0	to	2300.0 ˚F
	T	5	-270.0	to	400.0 ˚C	-450.0	to	750.0 ˚F
		6	0.0	to	400.0 ˚C	-200.0	to	750.0 ˚F
	B	7	0.0	to	1800.0 ˚C	32	to	3300 ˚F
	S	8	0.0	to	1700.0 ˚C	32	to	3100 ˚F
	R	9	0.0	to	1700.0 ˚C	32	to	3100 ˚F
	N	10	-200.0	to	1300.0 ˚C	-300.0	to	2400.0 ˚F
	E	11	-270.0	to	1000.0 ˚C	-450.0	to	1800.0 ˚F
	L	12	-200.0	to	900.0 ˚C	-300.0	to	1600.0 ˚F
	U	13	-200.0	to	400.0 ˚C	-300.0	to	750.0 ˚F
		14	0.0	to	400.0 ˚C	-200.0	to	1000.0 ˚F
	W	15	0.0	to	2300.0 ˚C	32	to	4200 ˚F
	Platinel 2	16	0.0	to	1390.0 ˚C	32.0	to	2500.0 ˚F
	PR20-40	17	0.0	to	1900.0 ˚C	32	to	3400 ˚F
	W97Re3 W75Re25	18	0.0	to	2000.0 ˚C	32	to	3600 ˚F
RTD	JPt100	30	-200.0	to	500.0 ˚C	-300.0	to	1000.0 ˚F
		31	-150.00	to	150.00 ˚C	-200.0	to	300.0 ˚F
	Pt100 (ITS90)	35	-200.0	to	850.0 ˚C	-300.0	to	1560.0 ˚F
		36	-200.0	to	500.0 ˚C	-300.0	to	1000.0 ˚F
		37	-150.00	to	150.00 ˚C	-200.0	to	300.00 ˚F
Standard signal	0.4 to 2.0 V	40	0.400	to	2.000			
	1 to 5 V	41	1.000	to	5.000			
DC voltage	0 to 2 V	50	0.000	to	2.000			
	0 to 10 V	51	0.00	to	10.00			
	-10 to 20 mV	55	-10.00	to	20.00			
	0 to 100 mV	56	0.0	to	100.0			

■ Alarm Type List (for setting ALM-AL1 to AL4)

Alarm type	Setting	Alarm type (11 to 20: with waiting action)	Setting
PV high limit	1	PV high limit	11
PV low limit	2	PV low limit	12
High limit deviation	3	High limit deviation	13
Low limit deviation	4	Low limit deviation	14
Deviation of high limit passive	5	Deviation of high limit passive	15
Deviation of low limit passive	6	Deviation of low limit passive	16
Deviation of high and low limits	7	Deviation of high and low limits	17
Deviation within high and low limits	8	Deviation within high and low limits	18
PV high limit passive	9	PV high limit passive	19
PV low limit passive	10	PV low limit passive	20
SV high limit	21	PV velocity alarm	25
SV low limit	22	PV velocity alarm passive	26
MV high limit	23	Self-diagnostic alarm	27
MV low limit	24	Self-diagnostic alarm passive	28
		FAIL passive	29

■ Controller Mode (USMD-MD) and Applicable Controller Type

Controller mode	Setting	Type of US1000		
		-00	-11	-21
Single-loop control	1	✔	✔	✔
Cascade primary-loop control	2	✔	✔	–
Cascade secondary-loop control	3	✔	✔	✔
Cascade control	4	✔	✔	✔
Loop control for backup	5	✔	✔	✔
Loop control with PV switching	6	✔	✔	✔
Loop control with PV auto-selector	7	✔	✔	✔
Loop control with PV-hold function	8	✔	✔	✔
Dual-loop control	11	–	✔	–
Temperature and humidity control	12	–	✔	–
Cascade control with two universal inputs	13	–	✔	✔
Loop control with PV switching and two universal inputs	14	–	✔	✔
Loop control with PV auto-selector and two universal inputs	15	–	✔	✔
Custom computation control	21	–	✔	✔

✔ = Applicable

■ MV Output Types (for setting OUT-MVS1,MVS2)

MV output	Setting	MV output	Setting
Time proportional PID with relay output	0	On/off control with relay output	3
Time proportional PID with voltage pulse output	1	Position proportional PID	–
Continuous PID with current output	2		

- Single-loop/cascade control with heating and cooling output (H = heating output, C = cooling output)
    4=(H=relay, C=relay), 5=(H=pulse, C=relay), 6=(H=current, C=relay),
    7=(H=relay, C=pulse), 8=(H=pulse, C=pulse), 9=(H=current, C=pulse),
    10=(H=relay, C=current), 11=(H=pulse, C=current), 12=(H=current, C=current)
- Dual-loop/temperature & humidity control with heating and cooling output (H = heating output, C = cooling output)
    4=(H=pulse, C=relay), 5=(H=relay, C=pulse), 6=(H=current, C=relay),
    7=(H=relay, C=current)