1 Range Change

1) CPU (8085)

* Not necessary to change the CPU.

2) Rear Panel

Rear Panel Needed

* Thermocouple input type

81401281-0T1	: 100/110	Vac
81401281-0T2	: 210	Vac
81401281-0T5	: 120	Vac
81401281-0T6	: 240	Vac

* RTD , mA , mV and V input types

81401281-0P1	: 100/110	Vac
81401281-0P2	: 210	Vac
81401281-0P5	: 120	Vac
81401281-0P6	: 240	Vac

3) PROMs (2764)

* Necessary to plug in four PROMs (U1,U2,U3,U4) corresponding to the range that will be used.
* There are three sets of PROMs.
  - no. 2008 (four PROM set) deg C for Japan
  - no. 2009 (four PROM set) deg C for the U.S. and Europe
  - no. 2010 (four PROM set) deg F for the U.S.
* For further details, see table-1.

4) Range Card

* Necessary to plug in the range card corresponding to the range that will be used.
* See table-1

2. Set Up for Calibration

1) Power Supply Voltage (Vac)

* 100V type : 105 +- 1 Vac
* 120V type : 120 +- 1 Vac
* 210V type : 210 +- 2 Vac
* 240V type : 240 +- 2 Vac
* (Turn off when connecting terminals)

2) Ambient Temperature

* 23.0 +- 1.0 degree C

3) DIP Switch Settings (0: off, 1: on)

* SW1 (upper)	00000000	
* SW2 (middle)	00001111	; linear input
* SW3 (lower)	00000000	; current output

4) Parameter Settings

* C01 =	100.0	; MV output upper limit
* C02 =	0.0	; MV output lower limit
* C07 =	0	; decimal point location
* C08 =	5000	; 100% value setting of input range
* C09 =	0	; 0% value setting of input range

5) Warm-up

* Wait at least two hours for device stabilization.
* Short-circuit terminals A+ and B- during warm-up.

3. Input Adjustment

1) Amplifier off-set adjustment
   * Short-circuit terminals A+ , B- and C.
   * Open jumper W70 (On the range card)
   * Adjust VR72 to set a PV=2500+-0 display on DCP511.
   * Short-circuit W70 by a wire-wrapping.

2) Connection between DCP511 and equipments

   Equipments Needed

   * Thermocouple type: (See figure 1 on page 6)

     - Thermocouple extension wires corresponding with the type of thermocouple being calibrated
     - Two insulated copper leads for connecting the thermocouple extension wire from the cold junction compensation box to the millivolt generator.
     - A millivolt generator
     - A cold junction compensation box

   * Volt,Milliampere type: (See figure 2 on page 6)

     - A volt(Milliampere) generator
     - Two insulated copper leads for connecting the volt generator to DCP511

   * RTD type: (See figure 3 on page 7)

     - A resistance box
     - Three insulted copper leads for connecting the resistance box to DCP511

3) Current adjustment of cold junction compensation resistance

   * Thermocouple type only (without type B)

   * Short-circuit two insulated copper wires.

   * Connect a voltmeter to terminals, A (or #20) and C.
     (Terminal #20 is connected to terminal A.)

   * Wait at least ten minutes.
     (Terminal temperature stabilization)

   * Adjust VR71 to get a specific voltage value on a voltmeter.
     (See table-1,value-1)

4) Input zero adjustment

(Input zero means 50% input. The A/D converter is a duplex type)

* Set a millivolt generator or a resistance box to a specific value.
(See table-1, value-2)

* Adjust VRxx to set a PV=2500 display on DCP511.

T/C,V,mV,mA type: VR70
RTD type: VR71

5) Input span adjustment

(Input span means 100% input.)

* Set a millivolt generator or a resistance box to a specific value.
(See table-1, value-3)

* Adjust VR73 to set a PV=5000+-1 display on DCP511.

6) Input zero/span adjustment repetition

* Repeat input zero adjustment and input span adjustment at least three times for confirmation.

7) Input 0% check

* Set a millivolt generator or a resistance box to a specific value.
(See table-1, value-4)

* Confirm that PV display is within 0+-2.

* If PV display is not within 0+-2, return to Input zero adjustment and repeat.

-- Six Pots (side view)

{ VR72 } offset
{ VR73 } input span

{ VR70 } T/C,mA, mV,V :input zero
{ VR71 } T/C: current RTD: input zero

{ VR74 } output span
{ VR75 } output zero

A Calibration Procedure of DCP 511

TABLE - 1

DIP sw	RANGE	(3) CJ Comp value-1	(4) Zero value-2	(5) Span value-3	(1) Input Zero value-4	
****** Domestic (ROM no. 2008) ******						
1	K09: CA ; 0 < 1200 'C	9.416	24.414	48.828	0	mV
2	P46: Pt(JIS) ; -199.9 < 200.0 'C	--	97.35	177.13	17.57	ohm
3	P05: Pt(JIS) ; 0.0 < 500.0 'C	--	192.01	284.02	100.00	ohm
4	W43: WRe0-26 ; 0 < 2300 'C	0.556	19.185	38.369	0	mV
5	E08: CRC ; 0 < 800 'C	14.205	30.511	61.022	0	mV
6	R16: PR13 ; 0 < 1600 'C	1.384	9.421	18.842	0	mV
7	J08: IC ; 0 < 800 'C	12.039	22.749	45.498	0	mV
8	W23: WRe5-26 ; 0 < 2300 'C	3.254	18.461	36.922	0	mV
9	B18: PR30-6 ; 0 < 1800 'C	--	6.793	13.585	0	mV
10	T44: CC ; -200 < 300 'C	7.329	4.629	14.860	-5.603	mV
11	S16: PR10 ; 0 < 1600 'C	1.398	8.386	16.771	0	mV
12	D19: PR40-20 ; 0 < 1900 'C	0.089	2.516	5.031	0	mV
15	C01: LINEAR ; Programmable	--	12.0	20.0	4.0	mA
15	V01: LINEAR ; Programmable	--	3.0	5.0	1.0	V
15	M01: LINEAR ; Programmable	--	5.0	10.0	0.0	mV
****** Export degree C (ROM no. 2009) ******						
0	H01: Pt(IEC) ; -199.9 < 200.0 'C	--	97.19	175.84	18.54	ohm
1	K09: CA ; 0 < 1200 'C	9.416	24.414	48.828	0	mV
2	H02: Pt(BS) ; -199.9 < 200.0 'C	--	96.27	175.83	16.70	ohm
3	H03: Pt(BS) ; 0.0 < 500.0 'C	--	190.49	280.98	100.00	ohm
5	E08: CRC ; 0 < 800 'C	14.205	30.511	61.022	0	mV
6	R16: PR13 ; 0 < 1600 'C	1.384	9.421	18.842	0	mV
7	J08: IC ; 0 < 800 'C	12.039	22.749	45.498	0	mV
8	W23: WRe5-26 ; 0 < 2300 'C	3.254	18.461	36.922	0	mV
9	B18: PR30-6 ; 0 < 1800 'C	--	6.793	13.585	0	mV
10	T44: CC ; -200 < 300 'C	7.329	4.629	14.860	-5.603	mV
11	S16: PR10 ; 0 < 1600 'C	1.398	8.386	16.771	0	mV
12	D19: PR40-20 ; 0 < 1900 'C	0.089	2.516	5.031	0	mV
15	C01: LINEAR ; Programmable	--	12.0	20.0	4.0	mA
15	V01: LINEAR ; Programmable	--	3.0	5.0	1.0	V
15	M01: LINEAR ; Programmable	--	5.0	10.0	0.0	mV
****** Export degree F (ROM no. 2010) ******						
1	KF1: CA ; 0 < 2400 'F	9.416	26.124	52.939	-0.692	mV
3	HF1: Pt(IEC) ; -300 < 900 'F	--	150.07	274.96	25.18	ohm
5	EF1: CRC ; 0 < 1800 'F	14.205	36.999	75.024	-1.026	mV
6	RF1: PR13 ; 0 < 3100 'F	1.384	10.093	20.275	-0.089	mV
7	JF1: IC ; 0 < 1600 'F	12.039	24.587	50.059	-0.885	mV
8	WF1: WRe5-26 ; 0 < 4200 'F	3.254	18.416	37.066	-0.234	mV
9	BF1: PR30-6 ; 0 < 3300 'F	--	6.884	13.763	0.006	mV
10	TF1: CC ; -300 < 700 'F	7.329	6.877	19.095	-5.341	mV
11	SF1: PR10 ; 0 < 3100 'F	1.398	8.950	17.993	-0.092	mV
13	ZF1: Ni/NiMo ; 0 < 2500 'F	9.111	35.335	71.330	-0.661	mV
15	C01: LINEAR ; Programmable	--	12.0	20.0	4.0	mA
15	V01: LINEAR ; Programmable	--	3.0	5.0	1.0	V
15	M01: LINEAR ; Programmable	--	5.0	10.0	0.0	mV

3. Output Adjustment

1) Milliamperes Output Adjustment (4 to 20 mA)

* Connect a voltmeter and resistances to terminals, 21 and 22. (See figure 6)
  Resistances: 500 ohms (1/2 W) in series with 100 ohms (Standard Resistance)
  Voltmeter: Measure the 100 ohms standard resistance
* Press AUTO/MANUAL key to get into a manual output setting mode.
* Set OUT=0.0 (Output zero adjustment)
* Adjust VR75 to get 0.4 V+-10 microV output.
* Set OUT=100.0 (Output span adjustment)
* Adjust VR74 to get 2.0 V+-10 microV output.
* Repeat zero and span adjustment at least four times for confirmation.
* Press AUTO/MANUAL key to get out of a manual output setting mode.

2) Time Propotional Output Adjustment

* Not necessary to adjust

4. Range Setting

Back to the original range from a linear input/output range

* Set dip swithes. BINARY FROM TABLE 1
* Do general reset.

How to do general reset

- Slide the internal chassis forward.
- Set the memory switch(M.P. M.E.) inside the device to M.E. position.
- Press and hold reset key (RESET) on front panel.
- Push and release general reset switch (G.R.) inside the device.
- Wait for ready lamp on front panel (RDY) to light (about 3 seconds).
- Release reset key (RESET) on fron panel.

5. Check in an Original Range

* Check some input points in an original range.