Digital Motor Protection Relay

< DSP-CSM, New Display Meter:DM II >

Samwha DSP Ltd.


DM - II

Contents

Digital Motor Protection Relay

< DSP-CSM, New Display Meter:DM II >

1.Abstraction

Installation	Model	Protection	Description
Panel Flush Mounting Type	DSP-CSM	▸ Over/Under Current ▸ Phase Loss ▸ Reverse Phase ▸ Locked Rotor ▸ Current unbalance ▸ Ground Fault ▸ Shock/Stall ▸ Short circuit	▸ Password, ▸ self-diagnostics, ▸ Alarm

Panel Flush Mounting Type	
Wire Through Type	Wire Terminal Type
	

2. Main Feature

◯ To give a guarantee to authorized operator: Password
◯ MCU based digital control : precised motor protection
◯ Compact size, Multi-function
*Protection : Over current/Under current/Phase loss/Reverse phase /Locked rotor/Shock(Stall)/Current unbalance,Ground fault,Short circuit
*Indication :Current/L1, L2, L3 , earth current ,accumulated working time[AWT], Bar Graph[operating/“oc” preset],Alarm LED,Trip LED

*Digital communication : 485 Modbus/RTU

◯ To cover a wide and precised current range for the protection
*10 Type : 0.5A～10A or 0.5A~6A exclusively,for external CT and for short circuit protection
*70 Type : 5A～70A or 5~25A for short circuit protection
*Extended current range with external CT : 1A～3000A

◯ To show a trip cause and operation information in character and/or number : 5 Digit Window

◯ To realize instant trip for short circuit protection : 0.05sec

◯ "Shock" protection : useful for instant mechanical shock due to over load while crasher,roller,conveyer,etc are working

◯ To indicate a necessasary information in every 3 sec

◯ Convenient installation of ZCT to sense a zero phase current for GF protection
*Standard type : to use external ZCT(200mA/1.5mA)
*Optional type : to use embedded ZCT**(not available for external CT application)**

◯ High sensitive level and wide range for ground fault protection : 30mA～2A/Zero-phase sequence current

◯ Possible to analyze a correct trip cause : stored wave of 2 cycle right before trip instant/able to check by "samdsp"

◯ Various way for reset: Manual or Automatic /to response flexibly for applied sequence system

◯ To keep a stable operation under frequency variation from Inverter : 30Hz ～ 400Hz

◯ Self-diagonostic test by one touch for "SET" key

◯ Alarm befor Tripping by over current

◯ To memorize latest number of 8 among trip events

◯ To have stable state under the noise environment :connection cable with line noise filter between indication meter and converter/panel flush mounting type

◯ Convenient installation into existed meter hole:65Φ hole or rectangular hole/ display meter of panel flush mounting type

3. Function

Protection	Operating time	Description
Over current	·d-time :1～300sec/def. ·o-time :Definite/1～60sec :Inverse/5~30 Class	·to protect over current of each phase /L1,L2,L3
Under current	·U-time :1～30 sec/def.	·to protect under current of each phase/L1,L2,L3
Current unbalance	8 sec	·adjustable:30%～90%: ·rate=[(max-min)/max]*100[%]
Phase loss	1~5 sec	·to protect phase loss of each phase,L1,L2,L3, based on load current
Reverse phase	0.5 sec	·to ptotect reverse phase based on load current
Locked rotor	dt + 0.1 sec	·to protect locked rotor in starting state
Shock/ Stall	0.5～3sec/def.	·to make a trip if preset value is sensed during working ·preset range to "OC" :180% ～ 700%
Ground fault	Edt:1～25sec, Eot:0.5～30sec/def	·to ptotect GF by zero phase sequence current sensed through ZCT
Short circuit	0.05 sec	*current range for short circuit protection -10 type:0.5～5A -70 type:5～25A *preset % for short circuit protection in "SSc" mode --possible preset value:2000%/max *Trip output comes through AUX output (05-06-08) to make trip for MCCB with short circuit current capacity -SS-tr is shown in "Auo" mode if "SS' & "SSc" mode is able state to protect short circuit -AUX output is tripped faster than main output
Indication	**Description**	
Rotated indication during the operation	*Indication in every 3 sec :3 phae current >> Earth current >> AWT *Load factor :displayed in bar graph[actual running current / preset value of "oc"] *AWT:accumulated working time *Possible to fix one of rotated factor or to release : repeated one touch with "CLR" key	

to check and/ or to change preset value of each mode during the operation	* Possible to check a value and a mode as pressing "SET" key once during the operation ▸preset value and mode are appeared alternatively ▸next mode as pressing “CLR” Key or previous mode as pressing “SET” key * Possible to change a preset value after entering into working state if the preset value of “OPSET” mode belonged to “CAB” mode group is “ON”/ factory default value is “OFF” * Return to operating mode as pressing both “SET” and "CLR" key in the same time or waiting for 10sec as storing adjusted value
Alarm	* Able to make alarm before tripping if actual current is kept over preset alarm rate to "OC" preset value over 3 sec * "AL" & "Preset value %" is shown in the order of alarmed phase rotation as “AL” % is flickering
Aux	**Description**
RS485	*Possible to monitor the operation data by "Samdsp"

4. Technical Specification

DIV		**Description**
Load Current range	10 Type	*0.5A～10A or external CT(0.5~6A) *0.5~6A for short circuit protection
	70 Type	*5A～70A *5~25A for short circuit protection
	With External CT	1A～3000A
Ground fault Current	Zero phase current	*30mA～2A *sensed through external ZCT or embeded ZCT
Time preset	Starting delay time(dt)	1～300 sec/def.
	over current trip delay time(ot)	*1～60 sec/definite T-I *5～30Class/inverse T-I
	under current trip delay time(ut)	1～30sec/def.
	Ground fault starting delay time(Edt)	OFF,1～25 sec/def.
	Ground fault trip delay time(Eot)	*0.5～30 sec/def.
	Shock/stall trip delay time(st)	0.5～3sec/def
	Phase loss trip delay time(PLc)	1~5sec/def
Allowable tollerance	Current	C<=2A:0.2A,C>2A:±5%
	Time	t<=2sec:± 0.2sec, t>2sec:±10%
Control power		*AC100V ～ AC240V,50/60Hz (DC90V ～ DC370V)
Control power		*DC24V(Optional)
Trip output	Main:95-96-98	1c(1-SPDT),3A/Resistive

relay	Aux:05-06-08)		1c(1-SPDT),3A/Resistive(possible to alarm output one of Ec/Ect/AL/uc/Shoc
Application environment	temperature	Operation	-25^{O}C～+70^{O}C
		Storage	-40^{O}C～+80^{O}C
	Humidity		30～85%/Relative,non-condensing
Current tollerance against changeable frequency from inverter			Average +,- 5%,30Hz～400Hz
Max Main Conductor Size			25SQ
Screw Torque			Max 0.6 N.m
Insulation Resistence/IEC-60255-5			100Mohm or more/500VDC,circuit-case
High Voltage Withstand Test/ IEC-60255-5			*circuit-case:AC2000V,60Hz, 1 min *contact-contact:AC1000V,60Hz,1min
Lightning Impulse Voltage Withstand Test / IEC-60255-5			*Circuit-Ground,Circuit-Circuit:1.2/50uS, 5KV *Control Circuits:1.2/50uS, 5KV
1 MHz Burst Immunity Test: IEC 61000-4-18			2.5KV,Positive/Negative under 2sec
Electrostatic Discharge:IEC-61000-4-2			Air:Level 3, 8KV,Contact:Level 3,6KV
Radiated Electromagnetic Field Disturbance:IEC-61000-4-3			Level 3, 10V/m
Electric Fast Transient Burst :IEC-61000-4-4			Power,Realy output:Level 4, 4KV
Surge Immunity test:IEC-61000-4-5			Relay output:1.2X50uS,2KV (0^{O},90^{O},180^{O},270^{O})
Voltage variation:IEC-61000-4-11			3ms/0, 300ms/70%
Digital communication		Physical	2 wire RS 485,Modbus/RTU
		Address	1～250
		Speed	9.6/19.2/38.4/57.6/76.8/115.2kbps
		Connection	Terminal:TRX(+),TRX(-)
		Termination resistance	it needs to use external resistance with 120 Ω if necessary
		Cable	Sheathed 2 Pair
Power consumption			6W Max

5.Preset Description

▶ Main Mode

Press "SET" key to enter into setting mode ,then enter password.
The more detail is described in "Operation of Control key "

Mode	Function/ range	Description	Factory Setting value
P****	Password	*need to input a number of digit , "0000",to enter setting mode *need to move a cursor from first digit(1000unit) to last unit(1unit) to pass over next mode as pushing CLR key(Enter function) 4 times. *possible to change password in "PEdIt" mode in CAB mode group	0000
Out/a/b	to define the pattern of main trip output in initial state	*Trip output : 1c(95-96-98) *a:output state is changed from the original state as the control power is ON/96-96→open,95-98→close *b:output state is not changed from the original state as the control power is ON/ 96-96→close, 95-98→ open	b
ct/setting value(CT ratio)	to preset a ratio of external CT	*This mode is available for 10 Type *To preset CT ratio [primary value/5] *CT ratio:1~600 *2t:twice winding through CT hole /0.3~3A *4t:four times winding through CT hole/0.2~2A *1:to sense a current through its own CT or external CT with 5/5 ratio	1
oc/setting value	to preset a range to protect over current	*Current range -10 Type : 0.5～10A/short circuit protection & external CT:0.5～6A -70 Type : 5A～70A/short circuit protection : 5A～25A *Whenever the preset current value over protection range for short circuit protection is appeared during preset job, SSC becomes naturally disable	10:10 70:70
dt/OFF/setting value	to preset starting delay time	*Trip delay time to prevent unwanted trip caused by starting current *1～300sec	5sec

		*available for sensing current over 0.2A , otherwise preset dt is not adopted internally	
Otc/deF/ Inv	to select time-current chracteristics for over current protection	*to decide T-I characteristics:deF /Inv *deF(definite):trip based on preset value for “OC”and “ot” *inverse ▸dt=0 : trip based on cold curve ▸dt>0 :trip based on hot curve after dt is elapsed(actually dt+calculated time in inverse curve) ▸Available multiple value in each type: -10Type:0.5~5A/600% -70Type:5~30A/600%	deF
Ot/ setting value	to preset trip delay time	*to preset time to make a trip when a current exceeds preset value *definite:1sec～60sec *inverse:0.2～30 Class	5sec
Lc/oFF /on	to protect Locked Rotor	*OFF:disable for this mode *ON:to make a trip in 0.1sec after eleapsed dt("Otc"=def,inv) if starting current exceeds 300% to oc preset value during dt	On
SS/oFF/on	to define available term for short protection	*oFF:disable only for starting time (dt), but this function is able after dt is elapsed *on:able from starting initially *Trip through AUX output within 0.05sec	on
SSc/OFF/Setting Value	to define short protection % to "OC"	*current range for short circuit protection -10 type:0.5～5A -70 type:5～25A *preset % for short circuit -possible preset value:2000%/max *OFF:disable for this function	*10:2000 *70:2000
Shoc/ oFF/setting value	Shock protection during working	*OFF:disable for this function *preset to "OC":followed calculation , max 700% -10Type:180%～[30/"OC"preset value]% -70Type:180%～[200/"OC" preset value]%	oFF

st/setting value	to preset a time for shock protection	*0.5～3sec/def. *this mode is shown as "st--" if shock mode is disable	"--"
PLc /oFF/ on	to protect phase loss by load current	*OFF:disable *ON:to make a trip to protect phase loss based on load current *preset time:1~5 sec	OFF
RPc /oFF/ on	to protect reverse phase by load current	*OFF:disable *ON:to make a trip to protect reverse phase based on load current within 0.5sec	OFF
Ec/oFF/setting value	to preset zero phase current	*for ground fault protection *OFF:disable *sensitive range:30mA～2A	OFF
Edt/oFF/setting value	to preset starting trip delay time	*definite T-I *preset range :1～25sec *this mode is shown alternatively as "Edt" & "--" if "Ec" mode is disable”	"－－"
Eot /setting value	to preset operating trip delay time for GF protection	*0.5～30sec/def. *this mode is shown alternatively as "Eot" & "--" if "Ec" mode is disable”	"－－"
uc/oFF/ setting value	to preset a range to protect under current	*preset range:0.4A～under "OC" preset value *In case preset "OC" value is under 0.6A, "UC" function is not available	OFF
ut/setting value	to preset trip delay time for under current	*1～30sec	"－－"
ub / oFF/ value	to define current unbalance rate	*to protect current unbalance among each phase *calculation : [(max-min)/max]* 100[%] *preset range : 30%～90%	50%

Au-o/oFF/Ec/AL/uc/ Shoc/Ec-tb/[SS-tr]	to preset a kind of AUX (07-08-10) trip output	*oFF:to make same output as main trip *trip output for AL/Uc/Shoc/Ec is independent from main trip and selected factor is not available in main trip,also if trip cause is clear, this trip output is reset naturally *Ec:only for ground fault protection *Uc:only for under current protection *shoc:only for shock protection *AL:only for alarm to oc before trip *Ec-tb: only for ground fault protection ,but this is not reset even if trip cause is clear,also main trip is acted with this aux trip together *Trip output to protect short circuit comes through AUX output (05-06-08) to make trip for MCCB with enough current capacity *SS-tr is shown in "Auo" mode only if "SS' & "SSc" mode is able state to protect short circuit *AUX output is tripped faster than main output	OFF
AL/setting value	to preset alarm level rate(%) to “OC”	*if other factor except "AL" in ”Auo” mode is preset, this mode is shown “AL--“ *preset range to"OC":15%～100% alarm is come out as the condition of preset alarm % is keeping for 3 sec or more → “95” point LED in bar graph and “AL” are flickering together	90
ALt/setting value & Clear	to preset a limit of accumulated working time necessary to give alarm & clear	*possible to preset a value between 0.1 hr～6553.5 hr by 0.1 hr unit *able to accumulate time in case 0.2A or more is sensed *indicated value is flickering as preset value is elapsed *To clear and to preset new value : enter into “ALT” mode in motor stop state, then put new required value by using "UP","DN" and come out the operation mode by pressing both "SET" & "CLR", lastly clear and new value preset is done in the same time	6500

rota/oFF/on	to decide a number of indicated factor in the order	*OFF:3 phase current(L1,L2,L3), GF current *ON:[3 phase current] + [AWT] *interval time between each displayed factor : 3sec	oFF
rESEt/Hr/ AuL-#	to decide how to reset trip state	*Hr:manual reset/Password input *Er:electrical reset :"Reset" key :"CLR" Key :Control power-off *AuL-#(n times):Auto reset by followed condition/max=9 :n=1:possible to do only by entering password :n>1 ▸1(once)～(n-1) times: reset automatically according to preset reset time without entering password ▸n(last times) : possible to do only by entering password : trip state is kept on untill making password reset even though the control power is off(password lock) *Password reset:reset is done by Coming out from operating mode after input password *Auto:only available for "OC" trip	Er
Aut/setting value	to preset auto reset time	*time range :0(instant), 0.1sec, 1～300sec *If Hr is preset in "rESEt" mode, this mode becomes disable	0
t-Aut/ setting value	to preset total possible time available for executing defined times of auto reset	*possible total allowable time to have the preset number of auto reset *time range:30min~60min *only possible for over current trip *the preset time is counted from the instant of first trip and return to the preset condition for auto reset after the allowable time is elapsed *Password lock in Auto Reset :able in case the preset number of auto trip is done within preset total reset time :otherwise, the counted number of trip time is initialized to previous preset value	30

		*If Hr is preset in "rESEt" mode, this mode becomes disable	
trIP /8 ～1 /trip cause /trip value	to show latest number of 8 trip cause	*to show the number of 8 trip cause in the order *press "UP" or "DN" in the "trip" mode state, then trip cause and value is shown alternatively *press "CLR" or ""SET" to check next event or previous event *In order to enter setup state on the way of trip condition, press both "SET" and “CLR” in the same time, finally release	
Addr /Setting value	to put self-address to communicate with PC	*to preset an address for 485 communication *range of number : #1 ～ #250	1
bPS /setting value	to decide communic ation speed	*to select communication speed :9.6/19.2/38.4/57.6/76.8/115.2kbps	9.6
Test	*to check if this relay is ready to work normally or not. *"tESt" is appeared in case the operator presses "CLR" key for 3 sec or more, then release pressed "CLR" key *main(95-96-98) & aux trip(05-06-08) output will be trip after counting down preset o-time(definite T-I) *make reset as pressing “Reset” key or “CLR” key		

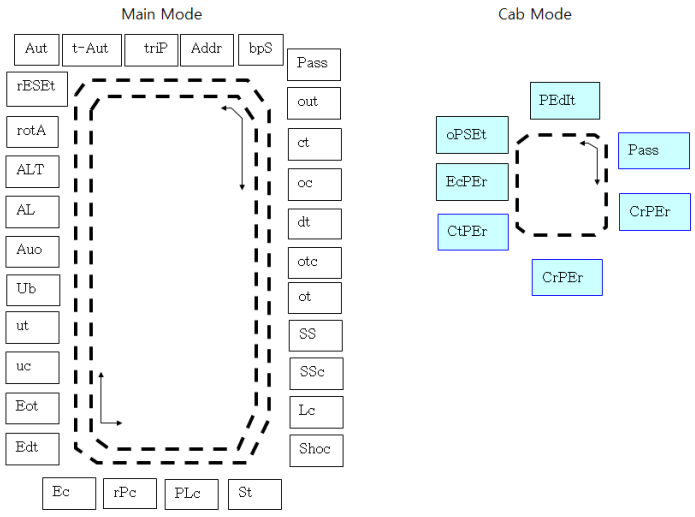
▶ Cab(calibration) Mode

This mode is appeared as pressing "SET" key for 5 sec or moe ,and is disappeared as "SET' key once more

Mode	Function/ range	Description	Factory Setting value
P****	Password Input	*need to input password to adjust this mode group so that authorized person may be able to adjust. *How to input is same as it of main mode	0000
CrPEr	to have a calibration for phase R"current		100
CSPEr	to have a calibration for phase "S" current		100

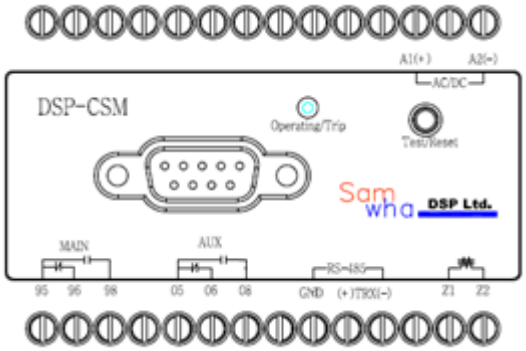
CtPEr	to have a calibration for phase "T" current	*Possible to adjust within +,- 50% by using "UP"."DN" key.	100
EcPEr	to have a calibration for GF current		100
OPSET/ON/ OFF	to decide if a preset value can be changed or not during normal operation	*ON:possible to change a preset value during normal operation *OFF: not possible to change a preset value during normal operation *This mode can not interfere “out” mode in any case	OFF
PedIt	to change Password	*Possible to enter new digit by using "UP" or "DN" key after positioning a cursor on the required digit as using "SET" & "CLR" key with directional job *How to complete password change : firstly press "CLR" key to come out "setting mode" ,then press both "SET" & "CLR" key	

6. The order of Rotated Mode

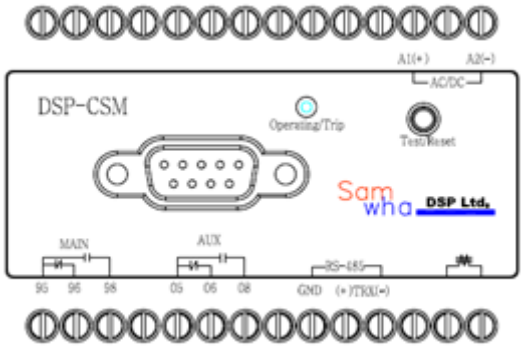


7.Input-Output terminal

‣External ZCT Type



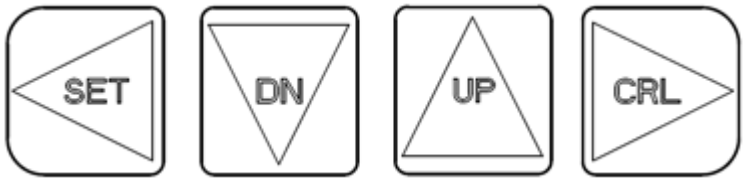
‣Embeded ZCT Type



DIV	Feature	Terminal	Description	
Input	Control power	A1(+),A2(-)	*85～250VAC,50/60Hz *90～370VDC	
	Z1,Z2	ZCT	*200mA/1.5mA in case using external ZCT : Basic Type *with Embeded ZCT :Optional Type	
Stae Indication	RED		Operating	Available for the converter of display meter type
	Green		Power/Stop	
	Yellow		Trip	
Output	Main Trip	*1c:95-96-98	*Over Current *Under Current *Locked Rotor *Phase Loss *Reverse Phase *Ground Fault *Current Unbalance *Shock/Stall	

	Aux	1c:05-06-08	*Au-o/oFF/Ec/AL/uc/Shoc/Ec-tb/SS-tr *Selected factor is excluded from main trip *SS-tr:short circuit *In case "SSc" Mode is preset in "ON", this mode is naturally preset in "SS-tb"
	485	TRX(+) TRX(-)	*RS485 digital communication

8. Operation of Control key

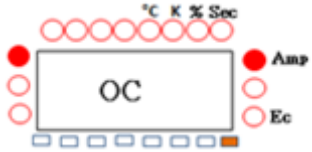
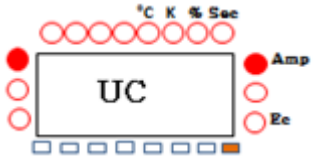
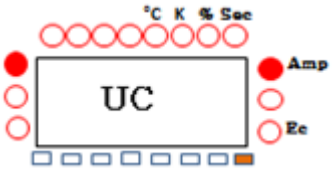
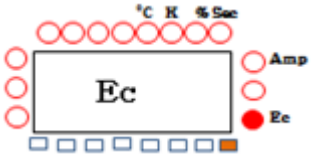
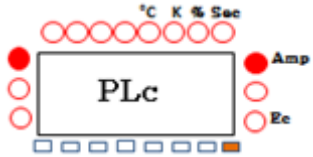


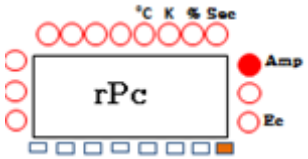
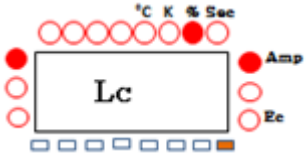
1."SET" key	*Press "SET" Key to enter into setting mode, then "P0000"(factory default password) is shown *Move cursor from first digit to right end digit by pressing “CLR" key ,finally press once more, if password is not changed from factory default value, but if password is changed, then make required digit by using "UP","DN" key untill operator meets changed password. *If there is no input for 15sec or pressing both "SET" and "CLR"key, it can be entered into operating condition.
2.Changed feature of Setting Key	*After entering into posible state for preset , each key acts its job as follows :SET→backward direction ,CLR→ foward direction, UP.DN→able to select number or character in preset mode. *The previous mode based on setting mode is come out as pressing "SET" key during doing a prest job
3."SET" Key & "CLR" Key/to select MODE	*Possible to select Mode by using "SET" or "CLR" key
4."UP" key & "DN" Key/Adjust	*Possible to preset required value as selection a character and or number by using UP/DOWN
5."SET" & "CLR" Key/Store	*The storage for preset data is completed by pressing both SET and CLR key in the same time or after 10sec is elapsed
6."CLR" key	*While each factor is rotated, one of rotated factor is fixed by pressing "CLR" key *After fixing a operating factor, the operator is able to rotate manually one by one as pressing "UP"(forwardly), "DN"(reversely)
To check preset value of each mode during operation	*possible to check value and mode as pressing “SET” key once during operation, *preset value and mode are appeared alternatively *possible to check next mode as pressing “CLR” Key *return to operating mode as waiting for 15sec without any touch *Not possible to change existed preset value

Test/Reset:"CLR" Key	*to check if this relay is ready to work normally or not. *"tESt" is appeared in case the operator presses test sw on the converter or "CLR" key for 3 sec or more, then release pressed test sw or "CLR" key *main(95-96-98) & aux trip(05-06-08) output will be trip after counting down preset o-time(definite T-I) *In case of display meter type, LED on the converter is turned on after a trip *After making trip, press "CLR" key for the reset action
The centered LED of Control key	This is turned on in case 485 digital communication is executed normally(CSL Type)

9. Trip Indication

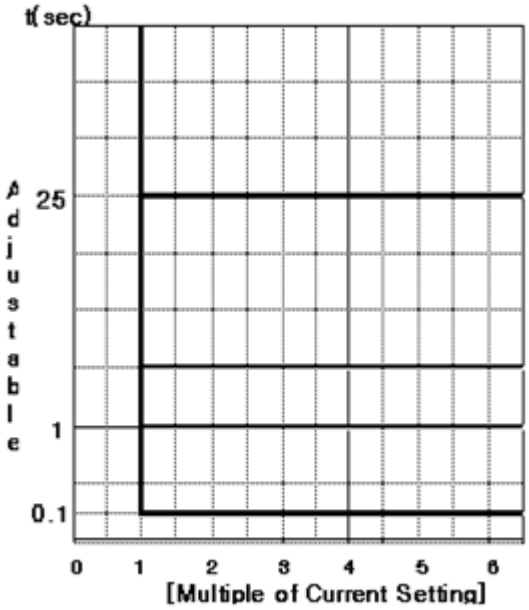
Trip cause and caused value is appeared alternatively

Trip	Display	Cause
Over current(oc)		*trip caused by over current in phase L1
Under current(Uc)		*trip caused by under current in phase L1
Current unbalance		*trip caused by unbalanced current in phase L1
GF		*trip caused by ground fault current
Phase loss		*trip caused by phase loss of phase L2 in load part

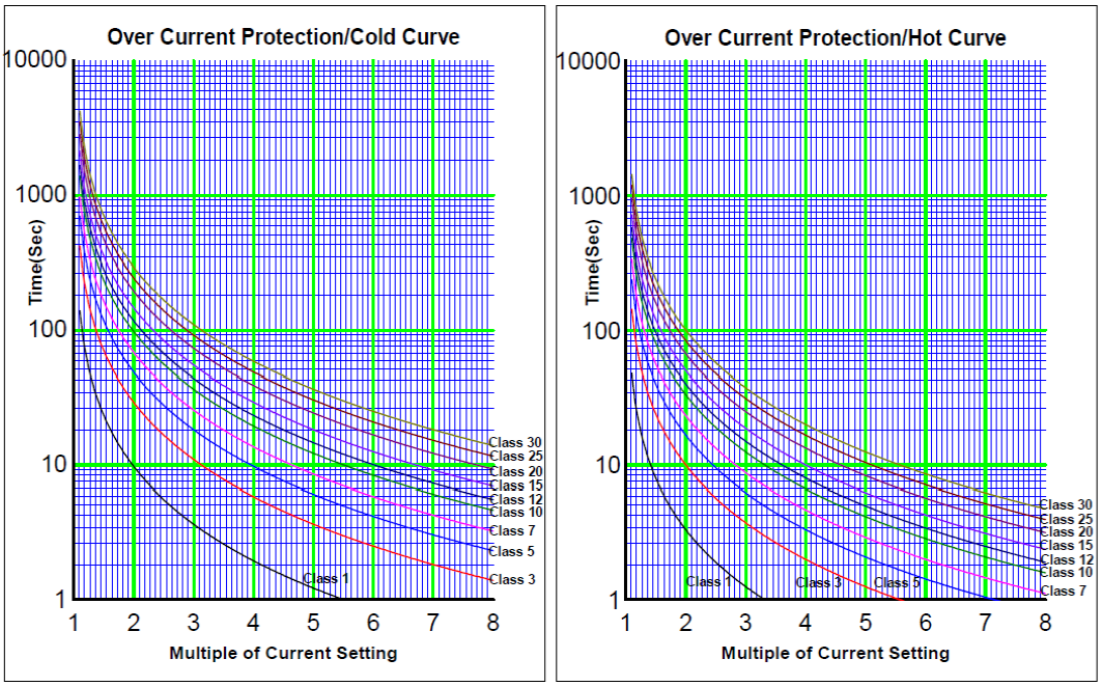
Reverse phase		*trip caused by reverse phase in load part
Shock/stall		*trip caused by instant shocking current in load part
Locked Rotor		*trip caused by locked rotor current in phase L2 during motor starts
Short circuit		*trip caused by short circuit in phase L2

10.T-I Characteristcs

▸Definite

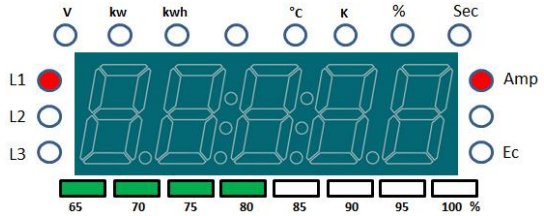


▸Inverse

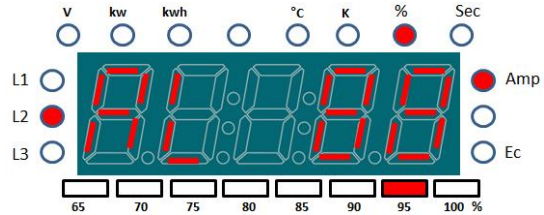


11. Rotated indication

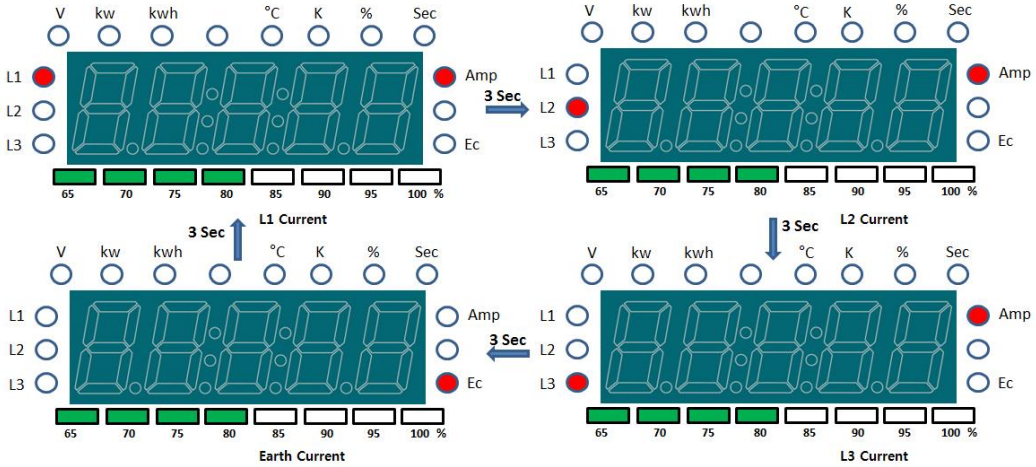
▸ Bar Graph : the % value with 5% point unit is shown based on the next formular, [(actual current value/“OC” preset value)*100], under the range of 65~100% while a motor is working



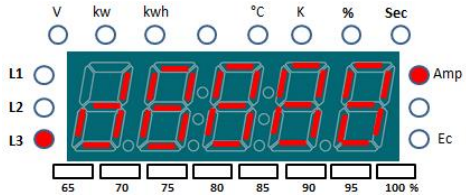
▸ “95%” point LED and “AL” are flickering without turning on bar graph LED if the preset alarmed level to “oc” is happened



▸ Each phase current(L1,L2,L3) >> GF current:"rota" mode/OFF



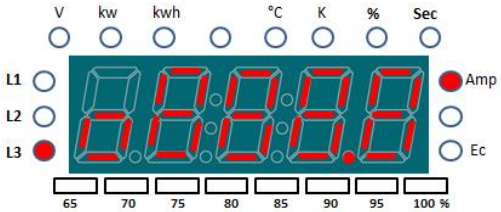
▸ Indication during d-time for mortor starting



→“d & Current value” is indicated if “d-time” is executed for mortor starting , but “d” is flickering in every 1sec

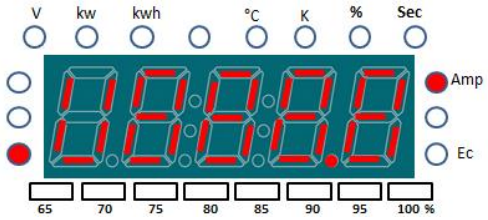
▸ Indication during preset operating time before trip in followed each case

- “OC” trip



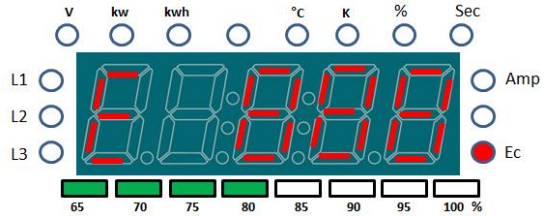
→ “o & Current value” is indicated if “o-time” is executed for over current protection ,but “o” is flickering in every 1 sec

● “UC” trip



→ “u & Current value” is indicated if “u-time” is executed for under current protection ,but “u” is flickering in every 1 sec

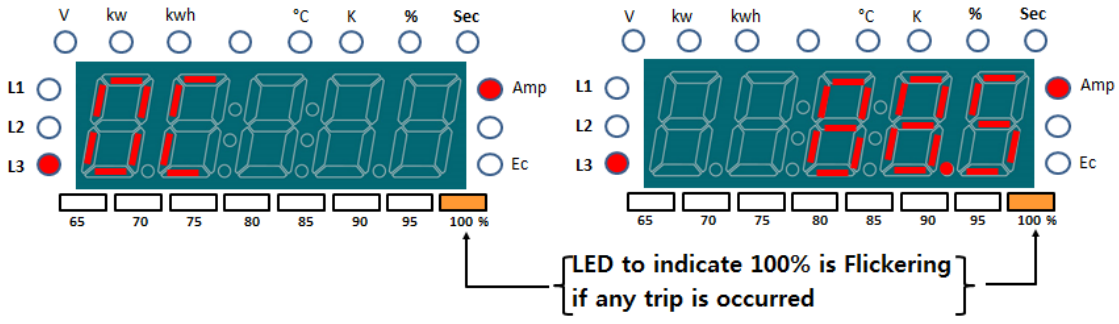
● “Ec” trip



→ “E & Ec Current value” is indicated if “u-time” is executed for under current protection ,but “E” is flickering in every 1sec

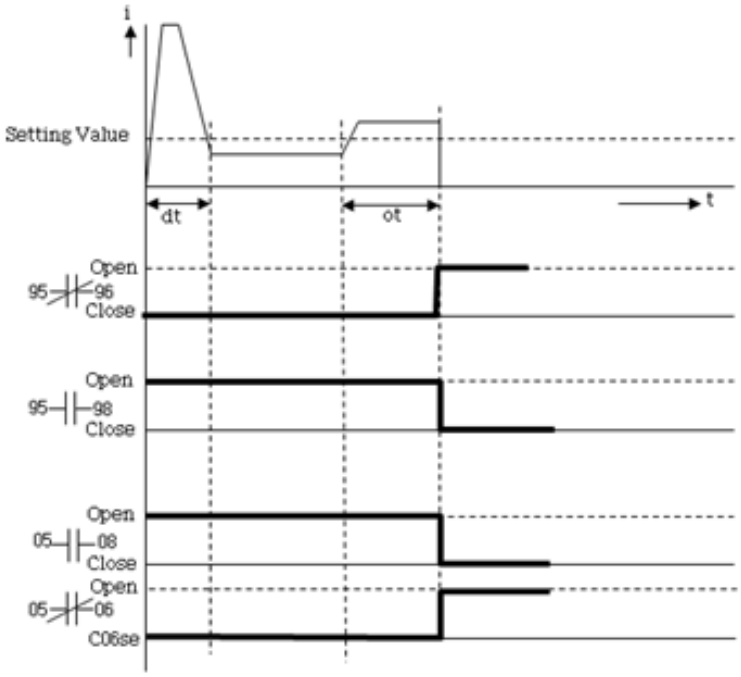
☞ "Ec-ct" is flickering if ZCT is not connected with a terminal of Z1-Z2 in motor stop state while the condition of "Ec" is available

▸ Indication after trip in every each case is that “trip cause” and “trip value” are shown alternatively as “100%” point LED in bar graph is flickering

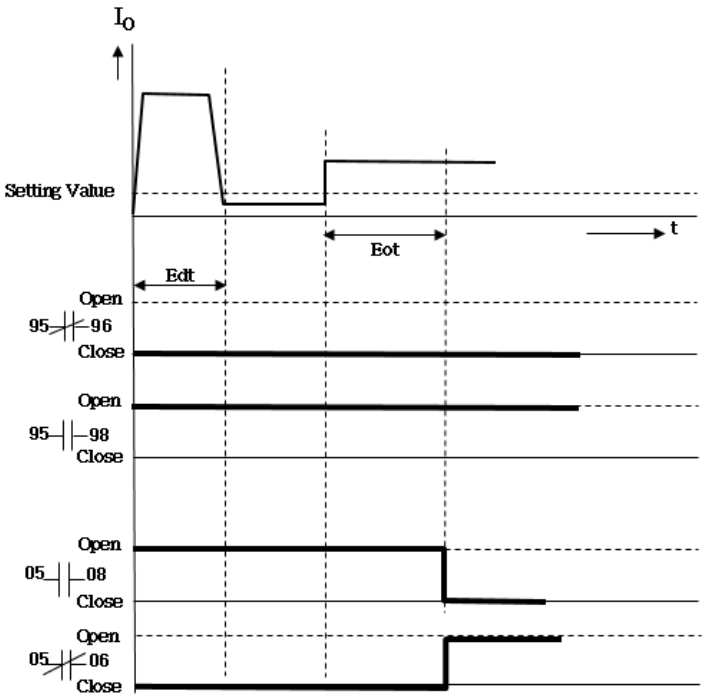


12. Time Based Trip relay Output

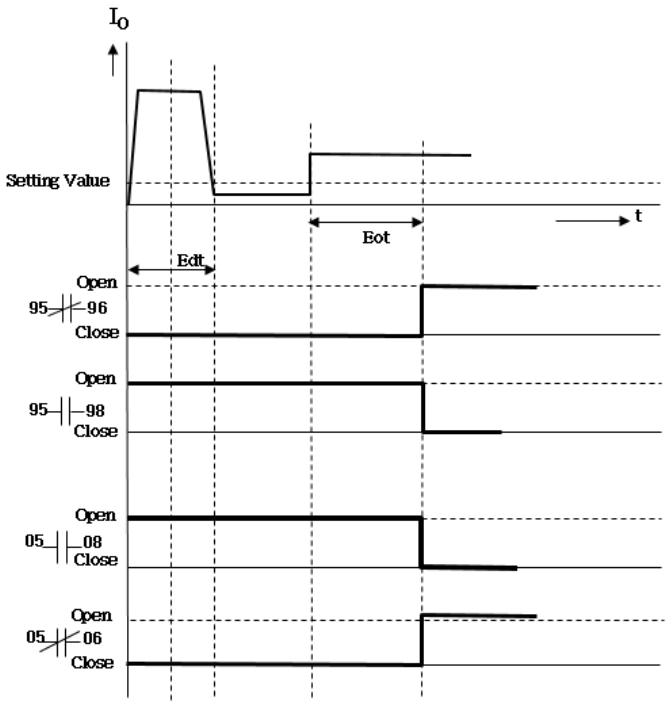
- Over current protection/"Au-o" mode:OFF/“out” mode:b



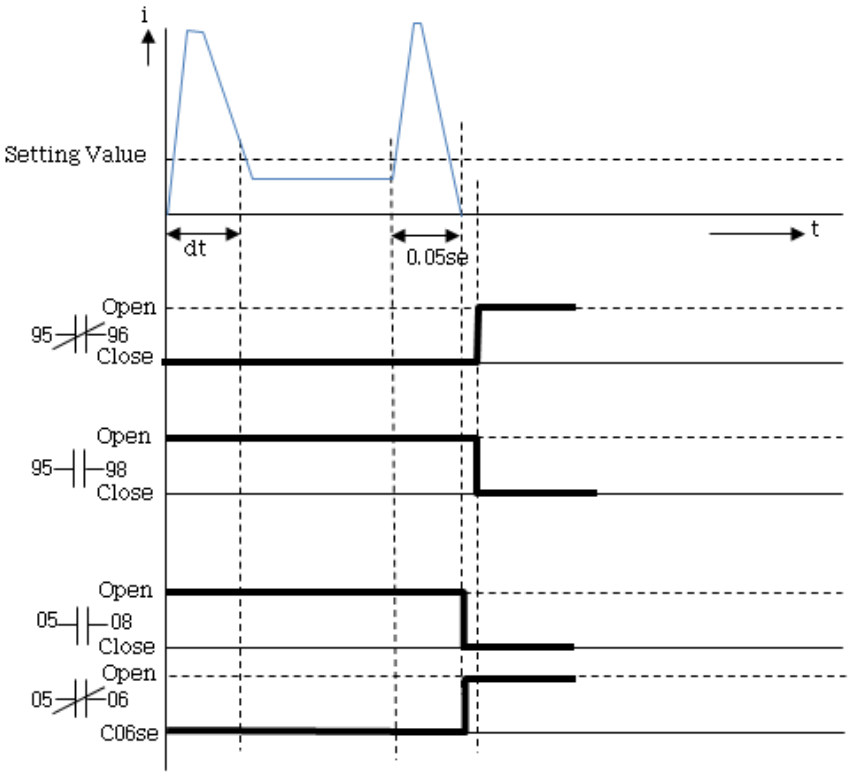
- GF protection/"Au-o" mode:Ec(05-06-08)



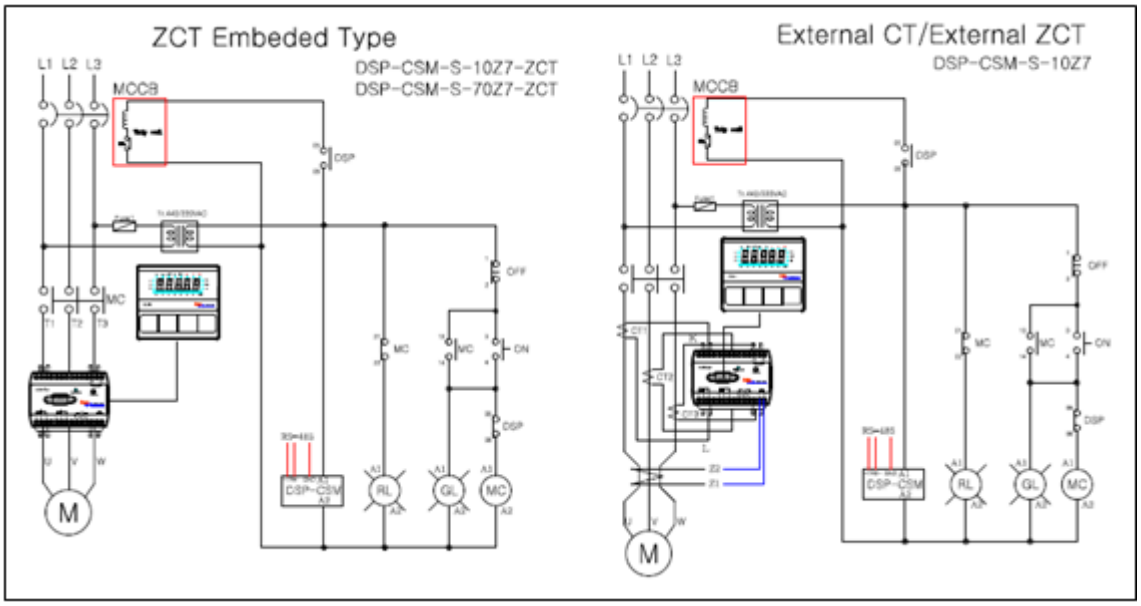
- GF protection/"Au-o" mode:OFF(05-06-08)



- Short protection/"Au-o" mode:SS, SS mode:OFF



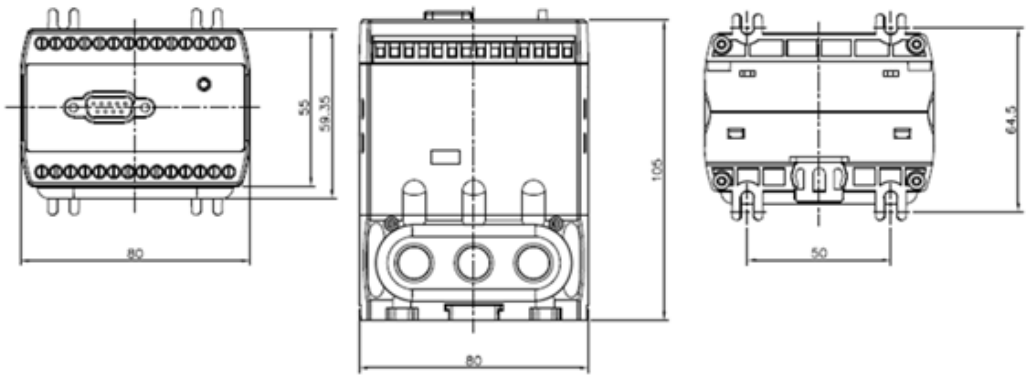
13. Application Sequence Diagram



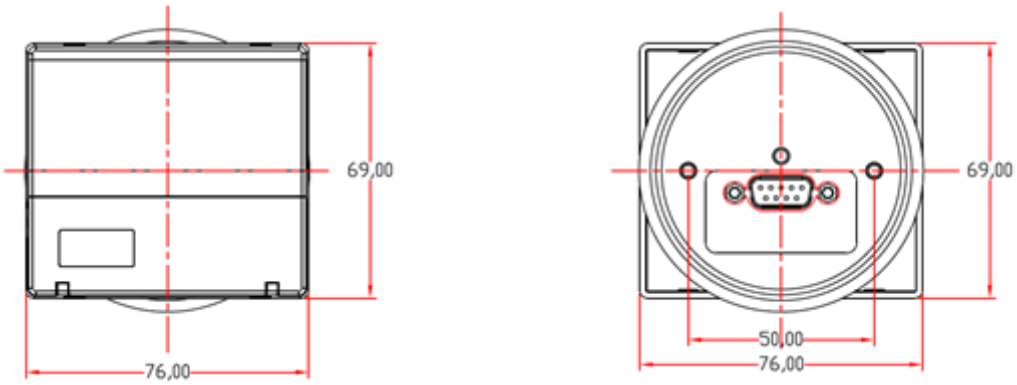
※Trip output caused by short circuit protection must be applied for AUX trip output so that this trip make a trip for MCCB with interrpting capacity by short circuit as selecting “SS” in “Auo” mode

14. Dimension

- Converter



•Display Meter



15. Order form

DSP-1(Type)-2(Rating current)-3(Control Power)-4(ZCT Embeded)
-P(Optional)

Item	Reference Code	Description
DSP-CSM	DSP-CSM-10Z7	Panel Flush Mounting Type,seperated meter type , 0.5A～10A(0.5~6A for short circuit protection), 85～260VAC , 50/60Hz (90～370VDC),external ZCT
DSP-CSM	DSP-CSM-10Z7 -ZCT	Panel Flush Mounting Type,seperated meter type, 0.5A～10A(0.5~6A for short circuit protection), 85～260VAC,50/60 Hz(90～370VDC),embedded ZCT/not available for external CT
DSP-CSM	DSP-CSM-70Z7	Panel Flush Mounting Type,seperated meter type,5A～70A(5~25A for short circuit protection), 85～260VAC, 50/60Hz(90～370VDC),external ZCT
DSP-CSM	DSP-CSM-70Z7 -ZCT	Panel Flush Mounting Type,seperated meter type, 5A～70A(5~25A for short circuit protection), 85～260VAC,50/60 Hz (90～370VDC),embedded ZCT/not available for external CT
Terminal Type	Basic reference code +T	Three terminal through CT hole of each phase is composed with one body

*Accessory

Item	Refeence	Description	Remarks
Cable	DSP-CABLE-12	1.2m	
Cable	DSP-CABLE-18	1.8m	
Cable	DSP-CABLE-30	3m	
Cable	DSP-CABLE-50	5m	
ZCT	DSP-ZCT-XX	100mA/1.5mA	XX:Inner diameter of ZCT
Display Meter	DSP-ID-DM IV	Input device/ Display Meter	

16. Monitoring program "samdsp" Operation

17.1 General

○ The user's PC basically based on Window XP and Window 7 should be embeded by following file

*.net framework 4.0(dotnetfx40_full_setup.exe) for MS Window :able to down load from MS or www://samwhadsp.com

○ PC has to use protocol converter(DSP-CMB/CMB-A) to connect between PC and DSP-CCM/CSM : CCM(TRX+,TRX-)/485 ↔ PC/USB, 232 Port

17.2 How to install "Samdsp"

○ Down latest "samdsp-v(version number)" file provided by Samwha DSP Co.(Web page www:samwhadsp.com) or CD, then make a release for compressed file.

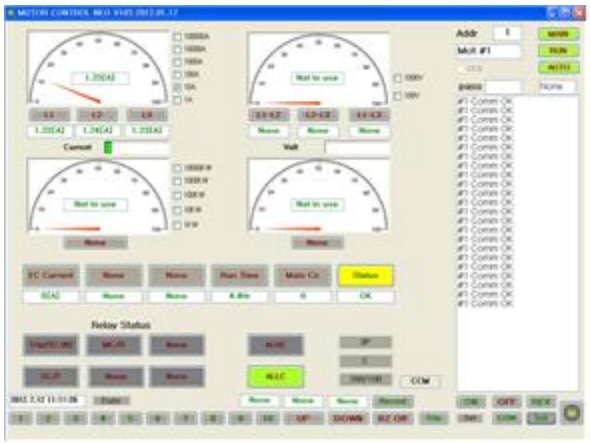
○ Check if "samdsp" folder is created in C:/ and make double click 

,then followed window is shown

○ If Comm Error is shown, make Pop-up window be shown as making click "COM" in the right bottom to preset communication condition

○ Preset communication speed of DSP-CCM and select usable port to preset correct port in used port in Pop-up window.
Finally make SAVE and come out as making click "close symbol" in the upper right corner,then normal initial window is come and "Comm OK" sign is shown.

○ F2 Key in PC works as toggle switch to select DSP-CCM or VIP-5CM
○ Make click "Main" to monitor an operation state of DSP-CCM



○ Make click "SET" after entering password to check a preset value of DSP-CCM/ CSM or to preset changed preset value
- LOAD : to show preset value of "samdsp" that is operating in PC
- SAVE : to save changed preset value among loaded preset value in PC
- SEND : to save loaded preset value in PC into converter of DSP-CCM
- DN : to call preset value of converter of DSP-CCM

·Make click "Trip" to check trip state of DSP-CCM/CSM