

Motor Working Recorder

<Model : DSP-MWR-S/"Samdsp">



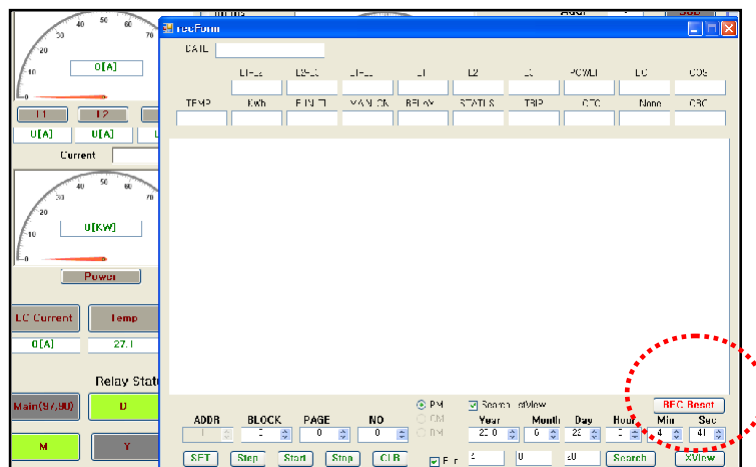
Sam
Wha DSP Ltd.

Motor Working Recorder

1.Feature

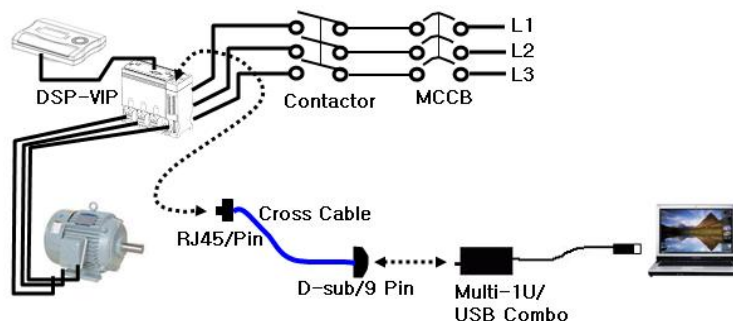
❑ Motor is working

- Internal communication with a converter of VIP by RS232
- External communication with Master(PC, PLC) through 485 as a RTU/Modbus
- Operating data is stored in every second while the motor is working
- Able to communicate with PC directly through a protocol converter with 485 <> USB/232
- Convenient engagement for a termination resistance of extreme end unit by DIP SW
- Possible to select data storage interval time(DSIT) in DIP SW
 - ▶ DSIT : 0.05sec, 0.1sec, 0.2sec, 1sec
 - ▶ Data is recorded while the motor operated only by logic input is working
- Convenient wiring connection through RJ45 or 10P screw terminal
 - ▶ RJ45 : only available for the test
 - ▶ screw terminal : available for actual field connection
- Evacuate a storage space of this recorder prior to adopt actual job as clicking “REC Reset” ,which is shown as pressing F10 of User’s PC after entering into record mode in main window ,then existed data is clear and this recorder is ready to work.

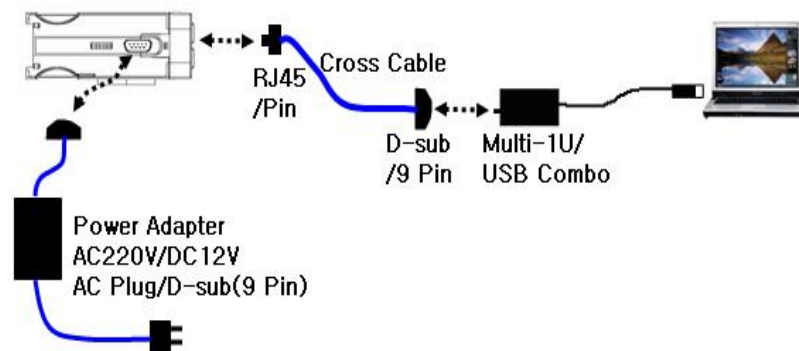


❑ Motor is stopping

- Possible to monitor and to retrieve a data from DSP-VIP combined with MWR-S in the field by the PC executed in “samdsp”



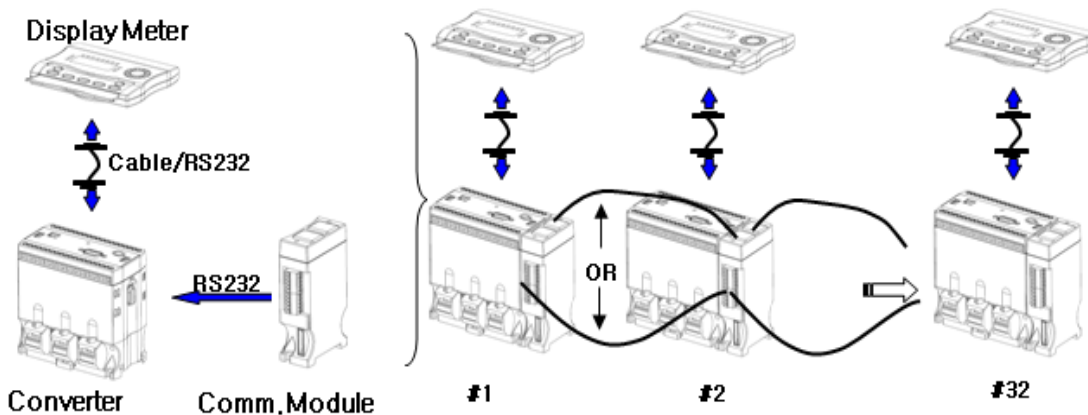
- Possible to monitor and to retrieve a data from this separated recorder in the office by the PC executed in “samdsp”, but to do so, DC 12V must be supplied for this recorder as followed connection diagram.



- Possible to retrieve a raw data by Excel format
- Possible to analyze a data by the typical graphic format

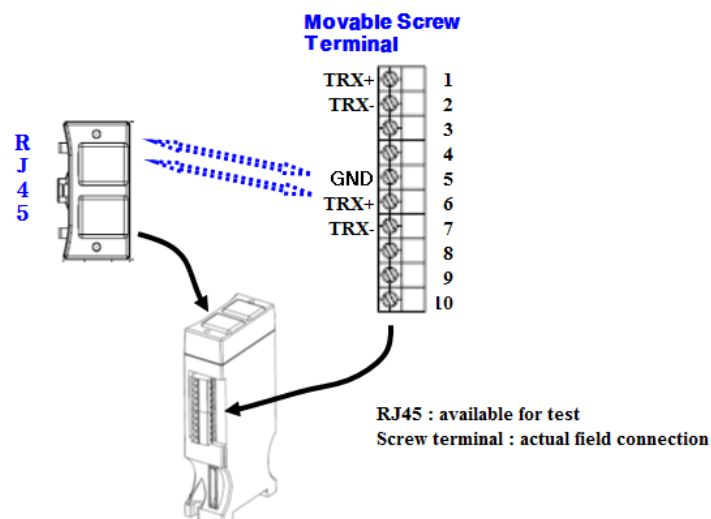
2. Structure

a. Coupling with converter



b. Detailed communication & recorder module

► Serial communication wiring through RJ45 or screw terminal



3. Technical Specification

- Memory capacity : 1 Gbyte Flash Memory
- Embeded calendar / real time clock
 - *life time :10 years under power-off state
 - *time count : Year,Month,Hour,Minute,Second
 - *time adjustment : possible by “samdsp”
- Convenient function selection in DIP SW
 - *Communication speed : 9.6Kbps~230.4Kbps
 - *Data Storage Interval Time
 - *Read only mode
 - *Master/Slave
- Serial communication wiring through RJ45 or screw terminal
 - *RJ45 : convenient test by “Samdsp” monitoring program
 - *Screw terminal : actual field wiring
- Possible to evacuate stored data
- DIP SW selection

DIP SW No.		Function	Description			
OFF ON 1 2 3 4 5 6 7 8	1	Termination Resistance	1	2	Terminal Resistance	
	2		ON	ON	Loaded	
			OFF	OFF	Not Loaded	
	3	M/S	ON:Worked as Master OFF:Worked as Slave			
	4	Data Storage Interval Time	4	5	Interval(sec)	Number recorded for 1 sec
			OFF	OFF	1	1
			OFF	ON	0.2	5
			ON	OFF	0.1	10
			ON	ON	0.05	20
	6	bps set	8	7	6	bps(Kbps)
	OFF		OFF	OFF	9.6	
	OFF		OFF	ON	19.2	
	OFF		ON	OFF	38.4	
	OFF		ON	ON	57.6	
7		ON	OFF	OFF	76.8	
		ON	OFF	ON	115.2	
8		ON	ON	OFF	230.4	
		ON	ON	ON	Auto baud	
3~8	Read Only Mode	*DIP SW #3~#8 :ON *Address & bps is preset naturally for 1 & 115.2Kbps *Possible to read only by PC				

◆ #3 in DIP SW : M/S

→M(Master)

: MWR-S leads a communication in terms of VIP, so VIP responses only for a call from MWR-S

: ”comm.” Mode in VIP must be preset in “Slave”

→S(Slave)

: VIP send a data to MWR-S in one direction without a call from MWR-S

- : "comm." Mode in VIP must be preset in "Master"
- : Available only for storage 20 of data per sec
- ◆ Auto baud
 - MWR-s is able to send a data to master as automatically matched with communication speed bps from VIP
- ◆ Read Only Mode
 - : this function makes an address of separated module from VIP to be #1 so that PC operated by "samsdp" may recognize the separated module
 - : This function is useful for user to analyze stored data under the state which MWR-S is separated from VIP.
 - : Basically MWR-S must be connected with VIP through a connection cable so that a data may be recorded prior to analyze
- ◆ DSTI(Data Storage Interval Time) vs bps
 - : The value for both DSTI and bps is relative each other,so preset value for these factor is contradicted each other. It means that bps is naturally changed according to DSIT.
 - : The relationship between bps and DSIT is as followed

Storage Interval		Possible stored number of Data according to preset bps						
Number	Time(sec)	9.6Kbps	19.2Kbps	38.4Kbps	57.6Kbps	76.8Kbps	115.2Kbps	230.4Kbps
1	1	1	1	1	1	1	1	1
5	0.2	2	4	5	5	5	5	5
10	0.1	2	4	5	8	10	10	10
20	0.05	2	4	5	8	10	20	20

4.Useful Application

A. Connection with PC

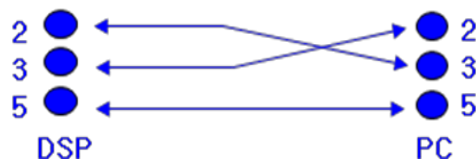
a) Direct communication between PC and Converter

In case the direct interface between Note PC and converter by RS232 to monitor and to preset data , a power source for Note PC also must be provided through an insulated transformer and a proper fuse

Otherwise ,a communication could be interfered from Note PC. Also if a direct connection between PC through a 9 pin connector and a VIP converter is done, a pin position for this wiring must be changed as below

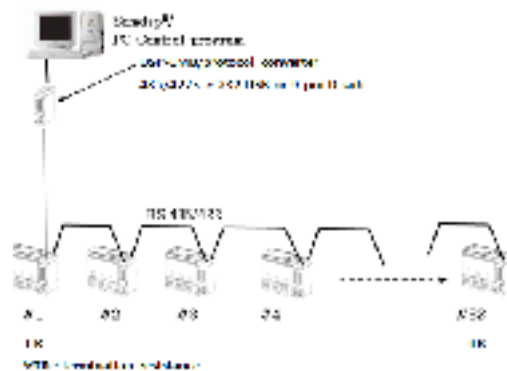


Monitor and input through Note PC

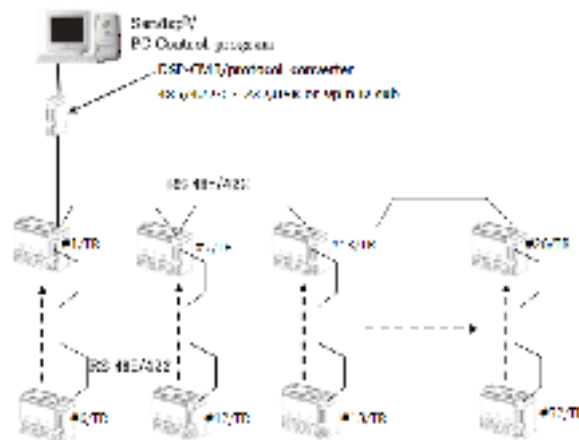


b) 485/422 Serial connection : PC/PLC(Master) < > DSP by RS-485/422

(1) Serial Connection



(2) Serial - Parallel Connection



Note

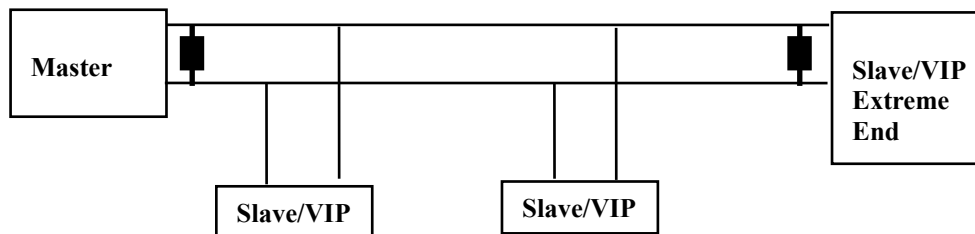
- The serial connection method is determined according to applied field condition
- The end connection device to connect with communication module is available for both RJ45 and/or screw terminal.
But it is mainly recommended to use RJ45 for the test of communication state one by one or a serial group ,on the other hand screw terminal for actual field connection wiring to secure from the vibration, noise, humidity,etc.
The example picture for RJ45 is as follows:



Also the actual connection through screw terminal between Master and Slave(DSP-VIP) in field bus system is as follows:



- In the connection on the concept with Master and Slave, a matching converter (protocol converter) to match 485 of VIP with Master, which is manufactured by other manufacturer, is required to have isolated power from a PC (Master)
- The position of termination resistance for the extreme end unit in serial communication between Master and Slave (VIP) is basically referred as follows, but it could be changed according to a field condition:



B. How to handle

- a. It is not possible that an operator presets an address in VIP while a motor is working, so if user wants to do so, motor must be stopped.
- b. The operator needs to check carefully additional selection by DIP SW before combining. not to make a separation again to preset DIP SW or termination resistance
- c. As possible as you can, do not separate this module once after combining in order not to give a damage caused by an unwanted force while the separation job is done
- d. The operator needs to give a very attention to combine this module with VIP converter through 9 pin D-sub which is located in inside of this module, because a connection pin could be damaged by unwanted enforcement during a combining job.
To prevent a pin damage during a combination, follow a next procedure
 - 1) check a pin condition if there is any defect, crooked state or not.
 - 2) put a hook into the hole in the bottom of VIP converter
 - 3) align correctly both D-sub connector each other
 - 4) press a top side of module slightly toward a converter until a cricking sound is sensed
- e. As like a same manner, a separation for this module from the converter must be done carefully. If a separation is needed inevitably, give a force slightly to expand a clearance between a converter and a module on the center part of top side as using something like a thin driver.
- f. Operator needs to use RS 485 < > RS232 (USB) protocol converter to make a communication between a converter of VIP and Note PC through a this module to operate VIP by using "Samdsp" operation program.
"Samdsp" is provided by a manufacturer in free of charge, also "Samdsp" is loaded in our web site (www://samwhadsp.com)
- g. The model name of protocol converter mentioned above is DSP-CMB (Multi-1U/USB Combo @ Cross Cable) and is not included in basic model of DSP-VIP
So if this is necessary, a purchaser of DSP-VIP needs to order this protocol converter separately

because this item is very common in the commercial market. It is mainly recommended that DSP-CMB is useful to test VIP by using "Samsdp"

h. In actual serial communication, the proper protocol converter is desirably required to have with two of 485 port at least.

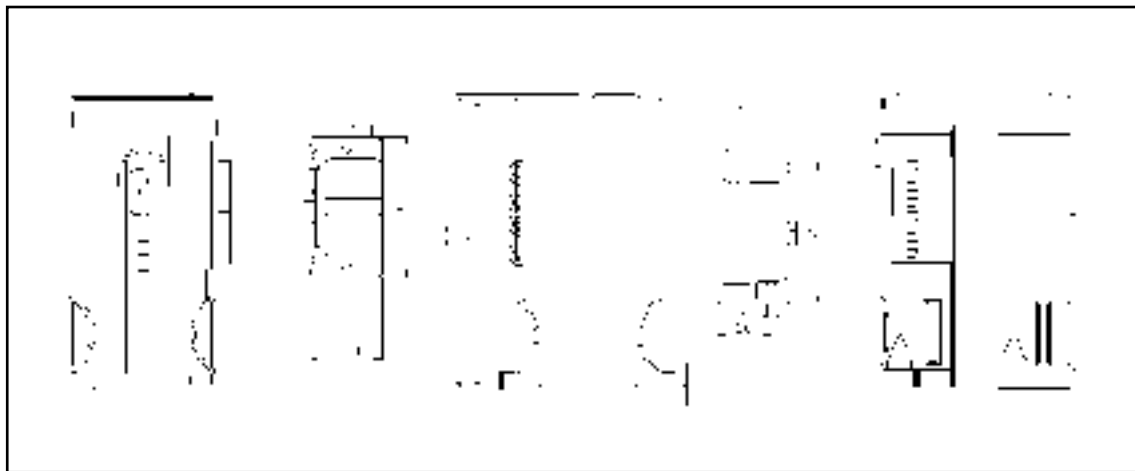
Also one end of cross cable is terminated with RJ45, hence if operator wants to connect this one end with 10P screw terminal of a communication module, please do to cut a RJ45, then connect a wire into screw terminal as follows:

*Screw terminal #1 : white colour wire with orange colour line

*Screw terminal #2 : orange colour line

*Screw terminal #5 : signal ground, make floating commonly if not required intentionally

5. Dimension



6. How to monitor and control : "Samsdp" software

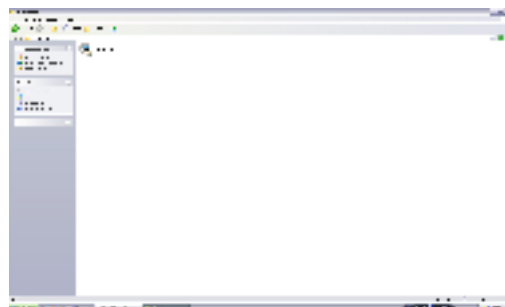
► General

- (1) The basic bps is ranged in 9.6K to 115.2K, but factory default value is 9.6K
- (2) The user needs additional USB/232 $\leftrightarrow$ 485/422 protocol converter like DSP-CMB to make PC communicate with VIP
- (3) The user's PC basically based on Window XP and Window 7 should be embedded by following file
 - *.net framework 4.0(dotnetfx40_full_setup.exe) for MS Window :able to down load from MS or "[www://samwhadsp.com](http://www.samwhadsp.com)"
 - * PC has to have 232C port ,otherwise it must use USB/232C converter

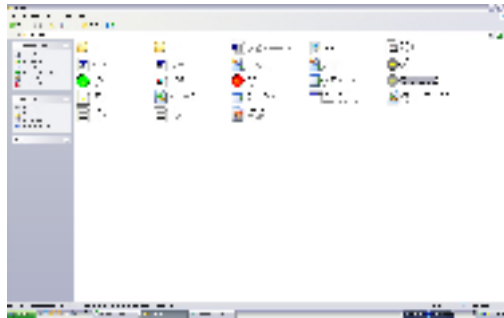
► How to install "samsdp" software

Down load for "samsdp" inside PC from CD or web, then check if c://samsdp is created.

- (1) Down load latest "samsdp-v**(version number)" file provided by SamWha DSP.Co.(web page or CD) in C:// of operator's PC and run into the execution for this file, then compressed file is released.



- (2) "samsdp" recognizes automatically the kind of the terminated unit(PM or RTM/RM) in serial connection
- (3) Check if c:\"samsdp" folder is created or not
- (4) If you find "Samsdp" folder ,execute c:\"samsdp" by making double click for it,then user will meet the circled "M" symbol,hereafter this samsdp** is executive file to open main window.



- (5) Execute "samsdp" with image of motor symbol "M" in circle,then main window is shown.



- (5) In this stage,if communication port to be run in "samsdp" is not matched with it in operator's PC, errorred message in right column is shown, then user can preset a right port number and bps in pop-up window that is shown by pressing "COM" button. After preset port number and bps is selected, make a press "SAVE" button in pop-up Window and come out.

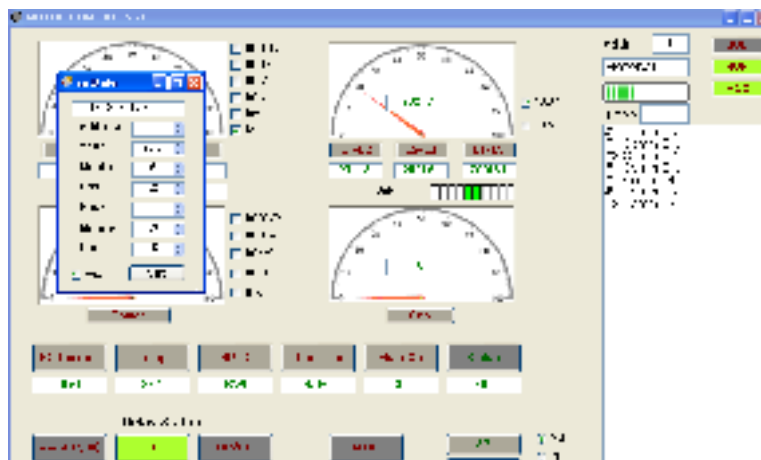


- (6) The customer is able to make it's own picture instead of SamWha DSP in main window and/or in each BMP1~BMP10 window. It is changed as stored its own picture of main window by the name of main.bmp and/or by the name of BMP1.bmp~BMP in "samsdp" folder.

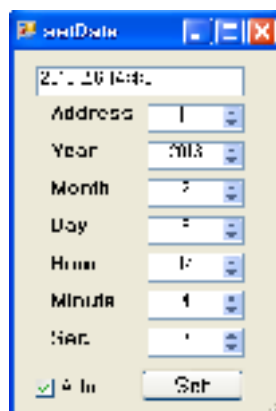
7.How to analyze a data by Software,“Samsdp”

a.General

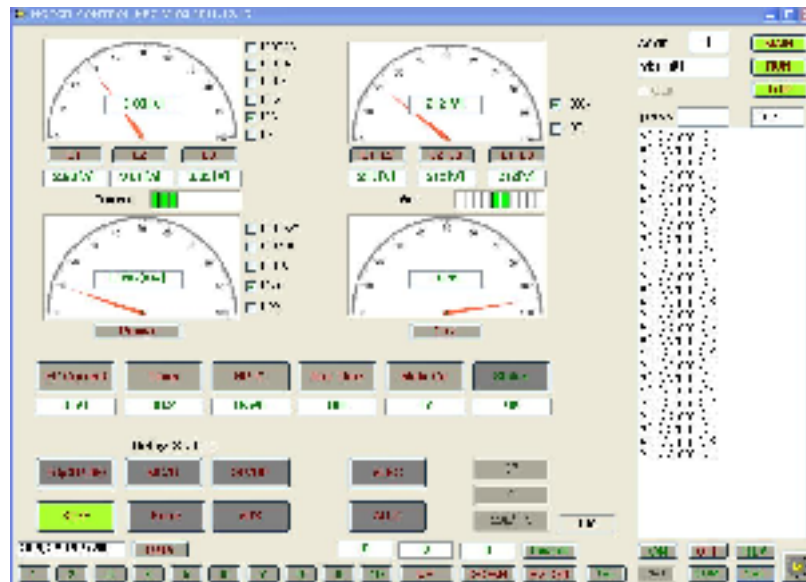
- This is aimed to analyze a data stored in flash memory of this MWR-S. It is possible to search a stored data which is matched with appointed term,also possible to have a raw data by Excel format for a searched data.
Furthermore it is possible to check a searched data in the typical graphic format
- Data stored space/Block-Page-NO
 - *Block : 0~1023
 - *Page : 0~63
 - *NO : 0~31
- Storage capacity/stored by a data per a second : $[1024 * 64 * 32]/[3600*24]=24$ days
- Firstly confirm if a data from VIP is recorded or not , as checking a variable number of Block-page-NO. This recorder is working normally if the number is in the increment orderly during a recording job,
- Make click for “Date” to match with a time appeared in PC ,then pop-up window is appeared as bellow.Consequently make double click “SET” in pop-up window, finally the time of “samsdp” is changed same as it of PC and comes out



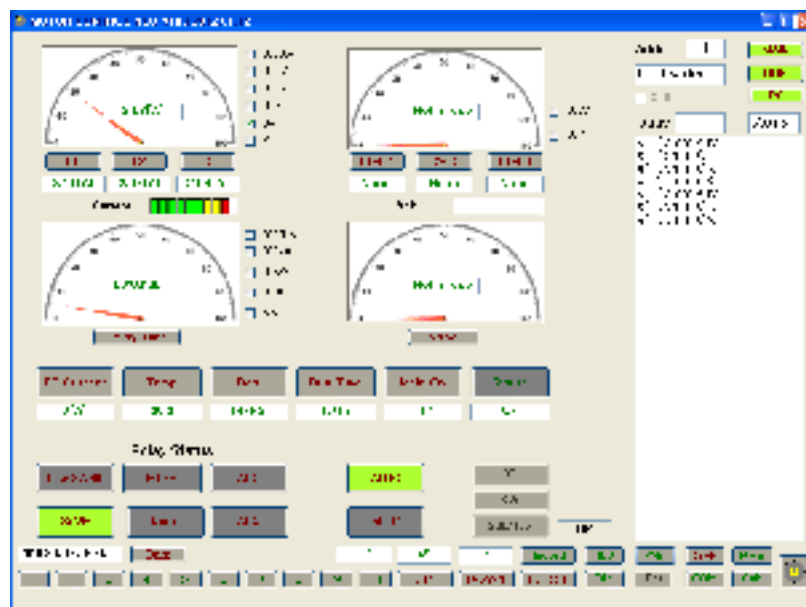
- “MAIN”, “RUN/OFF”, “LOP/RCS/MCC/PC” in right upper area
 - * MAIN : to identify a main window
 - * RUN/OFF : to indicate motor is running or stopping
 - * LOP/RCS/MCC/PC : to indicate a control position for motor according to logic input selection
- It means normal ready state that “ALLC” box is turned on which shows the state of main trip output and a daily time is varied.
- Identification for VIP Type : press “SET” after entering password and address ,then press “DOWN” ,”SAVE” to take an information from VIP , and come out to have main window.
Finally VIP type is shown in the bottom.
- How to match a daily time with PC if there is a difference each other: press “Date” and click “Auto”, “SET” , then come out



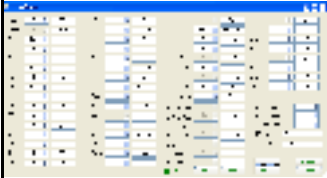
- Raw data in Excel format: the searched data is stored by the file name of recorder in C:/samsdp/excel as pressing “XView”
- Customized picture for main and/or each(BMP1~BMP10) window : the user is able to change a picture of main and/or each window as storing a file of customized picture by the name of main.bmp and/or bmp1.bmp~bmp10.bmp in C:/samsdp/, but the size of picture should be adjusted same as a existed size which is shown on the file due to mouse arrow.
- The each function in main window
→PM Type



→RTM Type

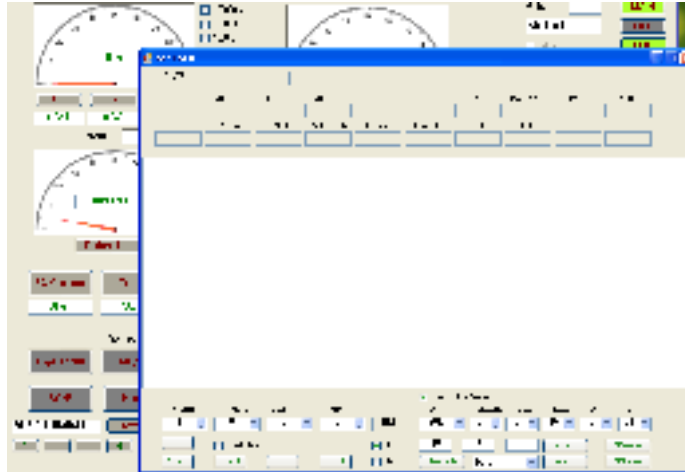


Division		Function
Indication	ADDR	*Address for VIP to communicate with the master in 485 serial connection
	Main/Sub[right bottom]	*to show operational window -Main : initial company logo window stored by c//main.bmp -Sub : operational working window
	MAIN - RUN/OFF – LOP /rCS /MCC/PC[right top]	*to show motor operation state, working window, control position according to logic input condition
	Graphic indication	PM/PL →Current *Line current for L1,L2,L3 *Centered value:average current for L1,L2,L3 →Voltage *Line voltage:L1-L2, L2-L3, L3-L1 *Centered value:average voltage for L1-L2, L2-L3, L3-L1 →Power:efficient power[KW] →Cos:power factor
		RTM/RTL →Current *Line current for L1,L2,L3 *Centered value:average current for L1,L2,L3 →Delay time:wating time for next measurement after first measurement action/the next measurement is done after 6 sec from motor stop if the next measurent time is on the motor working state
		Indication Scale *Scale to recognize indicated value
	Value Indication and Status	*PM/PL type -Ec : earth current -Temp : temperature sensed by PT100 (if PT100 is not connected, 516 is shown) -HP-C :KWH -Run Time :accumulated working time -Main Cn :the number of main contactor ON/OFF -Status : normal or abnormal about total indication state *RTM/RTL type -Ec : earth current -Temp : temperature sensed by PT100 (if PT100 is not connected, 516 is shown) -Res:latest measured insulation resistance -Run Time :accumulated working time -Main Cn :the number of main contactor ON/OFF -Status : normal or abnormal about total indication state
	Relay Status	*to show the state of trip output *PM/PL type :97-98,SC/F-MC/R, OP/UP,AUX

		*RTM,RM/RTL,RL Type : 97-98, C-F- R,AUX
	ALHC	All of VIP : higher level alarm
	ALLC	PM/PL Type:lower level alarm
	3P,KW,200/100	Status of selected DIP SW
	Date	Present time
	1 ~ 250 in bottom box	*Same address shown by right upper box(Addr) *every 10 is increased or decreased by UP,DOWN button
	BZ OFF	*to make a mute for trip buzzer sound
	Res	*to check a measured resistance value
	Record	*to analyze stored data
Command	TRIP	*to check a relative data of trip instant
	SET 	*MAXCOM : allowable number to manage a terminated unit in 485 serial connection. *SET ADDRESS : able to recognize an address of the connected unit. *AL Rst Time : able to interval time to show pop-up window shown in the trip event. *NAME : to edit a load name *Password : able to change password. *LOAD :able to load a stored data in the terminated unit into PC *DOWN : able to call a stored data from the terminated unit *SAVE : able to save a data shown in the window *SEND : able to send a shown data to the terminated unit *XView : available for MWR-S *XSave : available for MWR-S
	COM	*preset bps and communication port
	SUB/Main	To select Main or Sub window
	ON(Forward)	*to start a motor in PC
	OFF	*to stop a motor in PC
	REV	*to start reverse operation in PC

c. How to analyze stored data : call main window

1) Press "Record" button in the "MAIN" window , then the window is appeared as follows



2) Stored position of searched data(Block-Page-No)

a data storage job is stopped in the instant that "record" button is pressed while a data is recorded and its position is shown in the blank box according to the order of Block-Page-No from the left side box.

3) Data search

- firstly, the user needs to check if an address in the "ADDR" box is what the user wants to search a data
- make input a proper value of Block-Page-No or year-date-time in left side as referring a stored position vale of the instant which pressed "Record" button and is shown in the right bottom.
- if a wanted data according to input value for a storage position or stored time is searched, "data found" message is shown and a data just matched with input value is lined in the end of searched data

• Two ways to search

(a) Y-M-D-M-S : put expected time to search a data and press "Start" under the right bottom area. The user needs to try a few time until the data is searched.

(b) Block-Page-NO

- (1) Input a proper vale as referring a stored position of final instant to be recorded which is shown in right bottom area.
- (2) Make click for "Start use"
- (3) Select "Run" or "back"
- (4) "Run" : a data before input valued B-P-N is searched
- (5) "back" : a data after input valued B-P-N is searched
- (6) Press "Start" in the left bottom area

• Stop: make stop for searched job

• Clear: make clear for searched data

4) Date-Run toggle-Trip

This used to sarch a functional specialuzed data more easily

*Date: possible to search by the year-date-time criteria

*Run Toggle : possible to search a data concerned with first motor start-stop

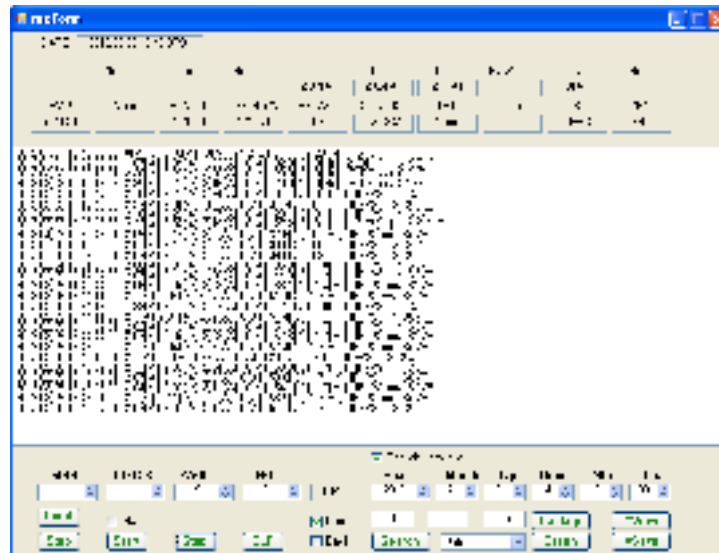
*trip : possible to search a data concerned with first trip

5) Step : possible to search a data one by one

6) If OK is shown in the "CRC" box in the right upper side, it means that data search job is done

normally. Otherwise, the user has to check a process again

c.How to manage a searched data



1) How to clear existed stored data

In case the user clicks “Rec Reset” which is appeared as by pressing F10 key of user’s pc, all of existed stored data is clear

2)How to take Excel format raw data

*The user is able to take all of stored data in Excel format by pressing “backup”,but this function should be used carefully because a lot of time is nedded to retrieve a data.

It is required that this function should be used particularly to retrieve all of data

*Load : the user is able to bring a recorded dtat in order to analyze which is automatically stored in c:/samdsp/excel/

*The searched raw data can be transformed by excel format as pressing “XVIEW”

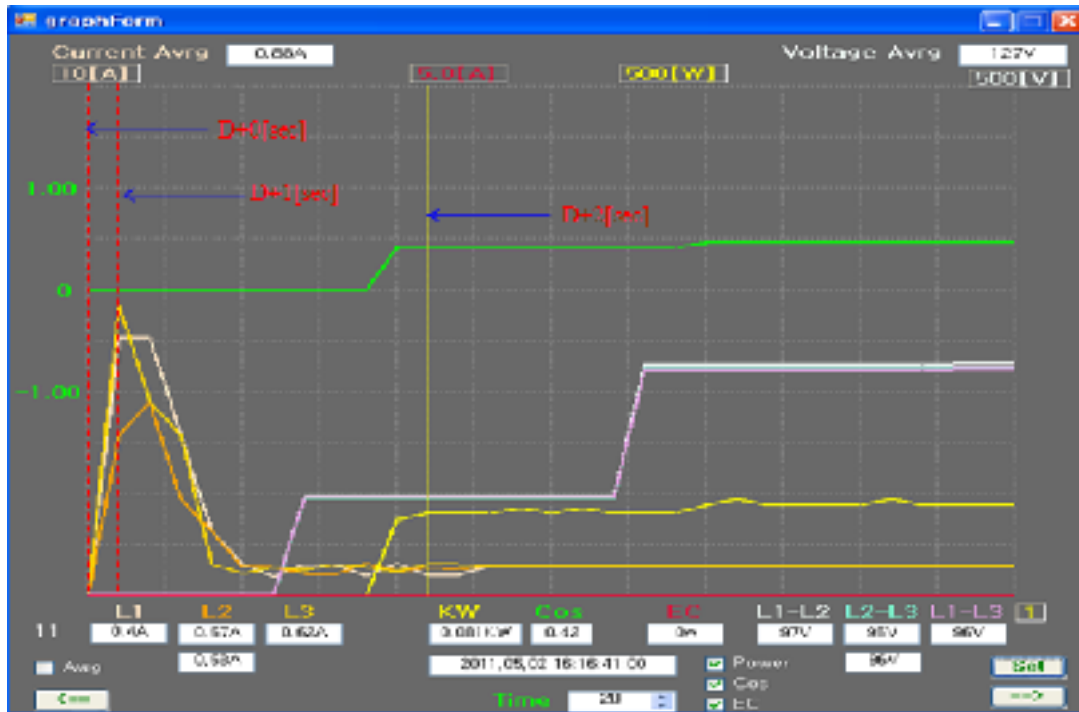
The image shows a screenshot of an Excel spreadsheet. The spreadsheet contains a large table of data with multiple columns and rows. The data appears to be a list of records, with columns for various attributes. The spreadsheet is displayed in a standard Excel format, with a grid of cells and a ribbon at the top. The data is organized into a structured format, likely representing the raw data mentioned in the text.

3)How to save Excel format raw data

The user is able to save automatically in the folder like c://“samdsp” as pressing “XSAVE”

4)How to make typical graphic diagram

The user is able to make a complexed typical graphic diagram as pressing “Graph”



- *The kind of displayed graph is classified by the colour of the character in the bottom
- *The number of the division in X-Y axis is 12-10 and the value inside a box upper part indicates a scale for the such graph to show a value of a point moved by the mouse of PC. This scale value is changed according to click the value box by the mouse and the shown value indicates the value of upper end point in Y-axis, but the value of lower end point in X-axis is fixed to zero.
- However, the scale value for the voltage is always fixed to 500V.
- *The yellow vertical line can be movable by the mouse and the value for the changed position on the X-axis is indicated inside each factor box in the bottom part.
- *The +1 and -1 with green colour on the Y-axis is only available for the power factor
- *The value of "Time" box in the bottom means time division,so the more this value is higher(20/max), the more the graph is detailed.
- *The extreme bottom end box value[Time]on the X-axis takes sec unit and this is changed according to click the value box or arrow symbol in the right and left bottom corner by the mouse.
- Whenever the user press this arrow one by one, the start time position of the shown graph begins in minus time or plus time from the box value on the Year-Date-Time
- *Choose a factor what you want to check , then press "SET"
- *Time : to adjust a width of graphic window
- *Colour match : the value of each factor is matched with a value with a same colour in the graph
- *Value check : move a cursor followed by a mouse to the point of the graph and make click, then each information is shown in the each factor box.

8.Order Form

Item	Reference Code	Description
Motor working recorder	DSP-MWR-S	*422/485/Modbus RTU *Data Recorder
Protocol converter	DSP-CMB	*485<> 232 USB :to connect to PC *RJ45,485<>232,9Pin D-Sub/ PC *Only for test,input,retrieval for VIP- CM44 combined with VIP by using “Samdsp”
Power adapter	DSP-ADT22	*AC220V/DC12V *Input/AC 220V Plug,Output/ DC12V:9Pin D-sub *To supply a power to MWR-S in case the operator analyzes a data from MWR-S in the office

Samwha DSP CO.,LTD
UNITAL STANDARD PROTECTION

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