

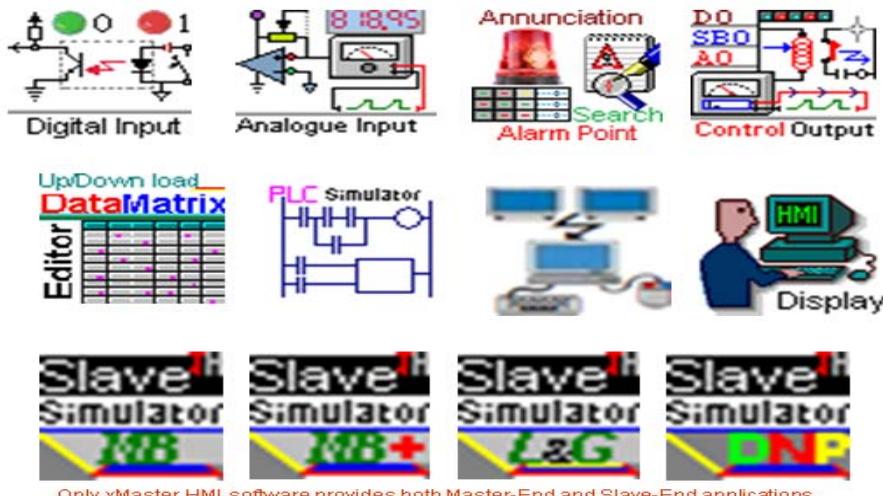
How-To-Do with xMasterSlave

- **xMaster**

- DNP3.0
- Modbus (RTU Serial, TCP/IP)
- Modbus Plus
- L&G 8979
- Hostlink (Omron, etc.)

- **xSlave**

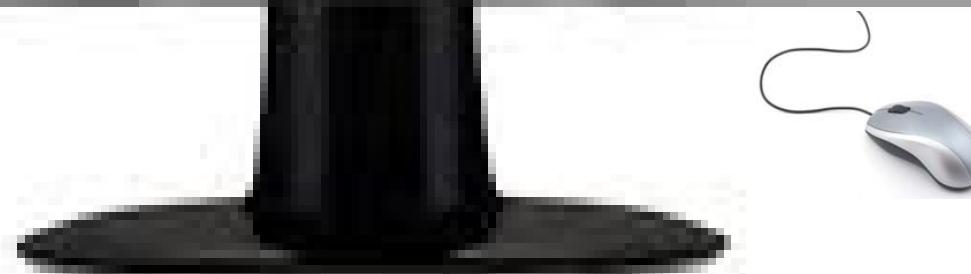
- DNP3.0
- Modbus (RTU Serial, TCP/IP)
- Modbus Plus
- L&G 8979



A powerful MMI HMI SCADA system that features full process visualization, data collection and management, data logging and graphic display, historical trending, alarming, data archiving and recipe handing, and supervisory control, and much, much more in one complete Windows software package.

Preliminary version 2019-2-13
(Total 123 slides) by JH

For A Sample of How To
Setup a Test Bench **and Slave
Simulator**, refer to slides in
Section 38.



The latest version of xMasterSlave is
Version 2. 2019-1-22

Note:

xMaster Application manual is xMaster_Manual.pdf (2007)

xSlave Application manual is xSlave_Manual.pdf (2015)

Reversion note: ReadMe.txt or ReadMe.pdf

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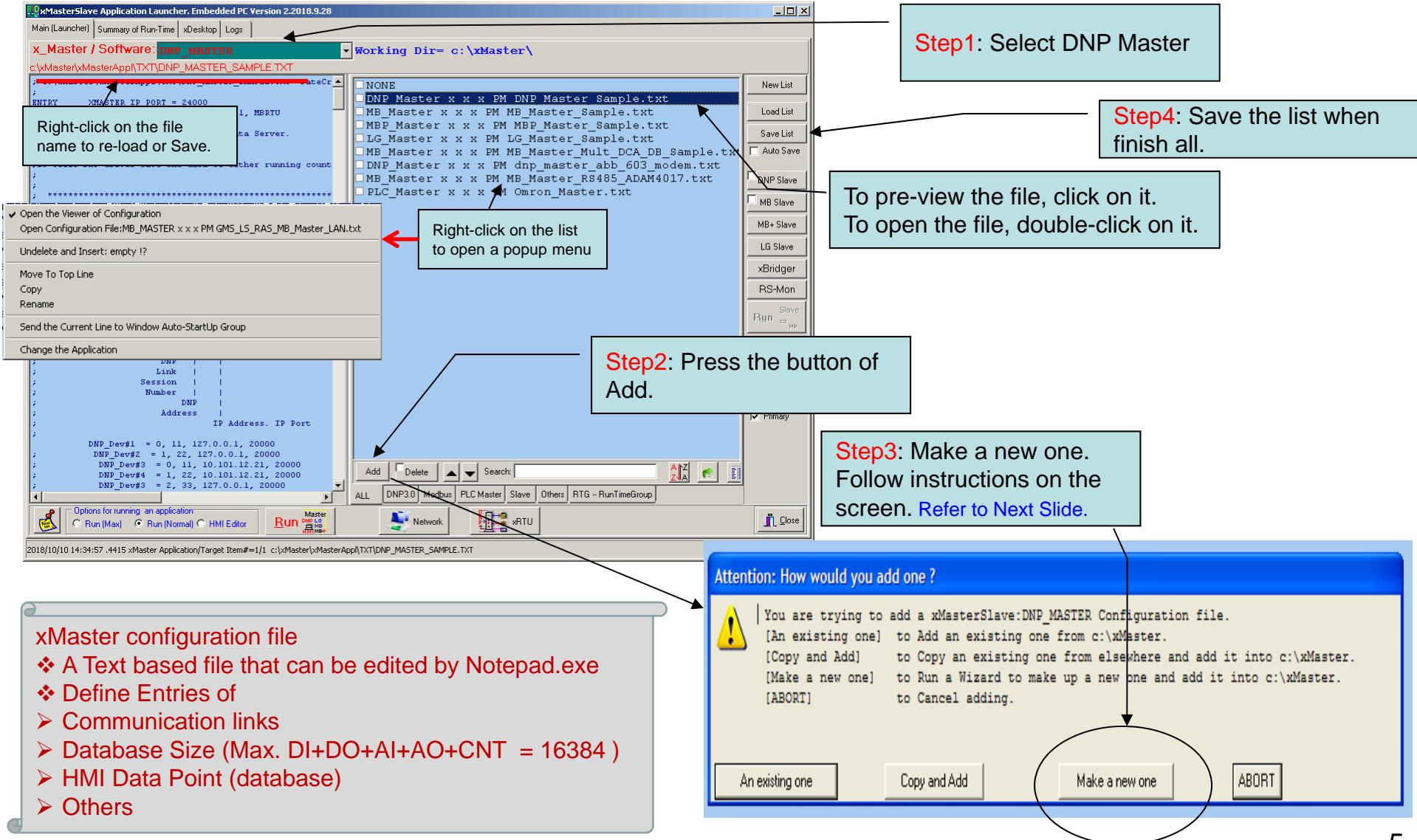
continue

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xBridge -- Ethernet Serial Servers, Serial-Line-Monitoring, etc. |

1. To Create a Point Database

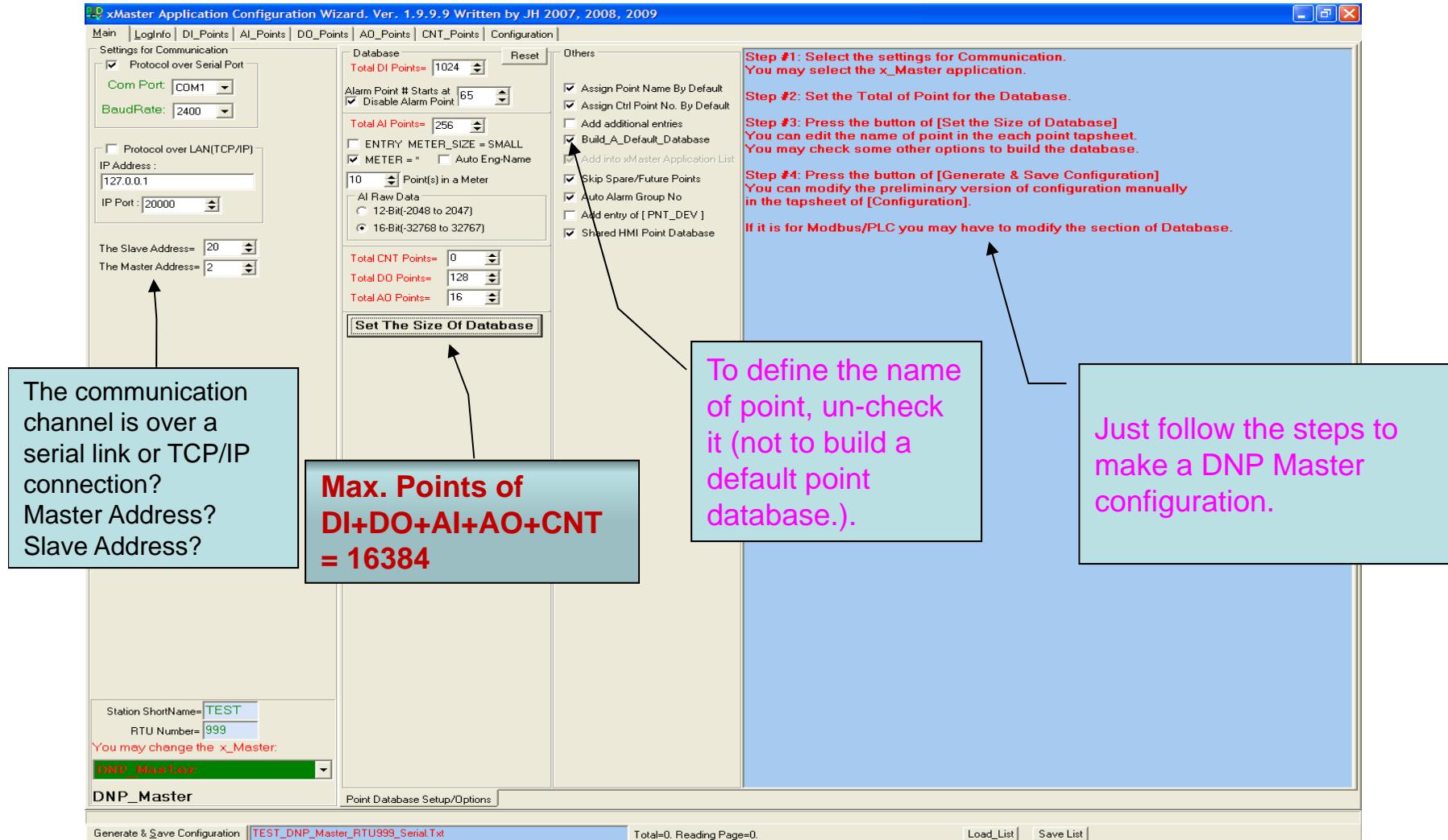
Create a DNP3 configuration Running DNP3 Master from xMaster as shown as follows:



1. To Create a Point Database

continue

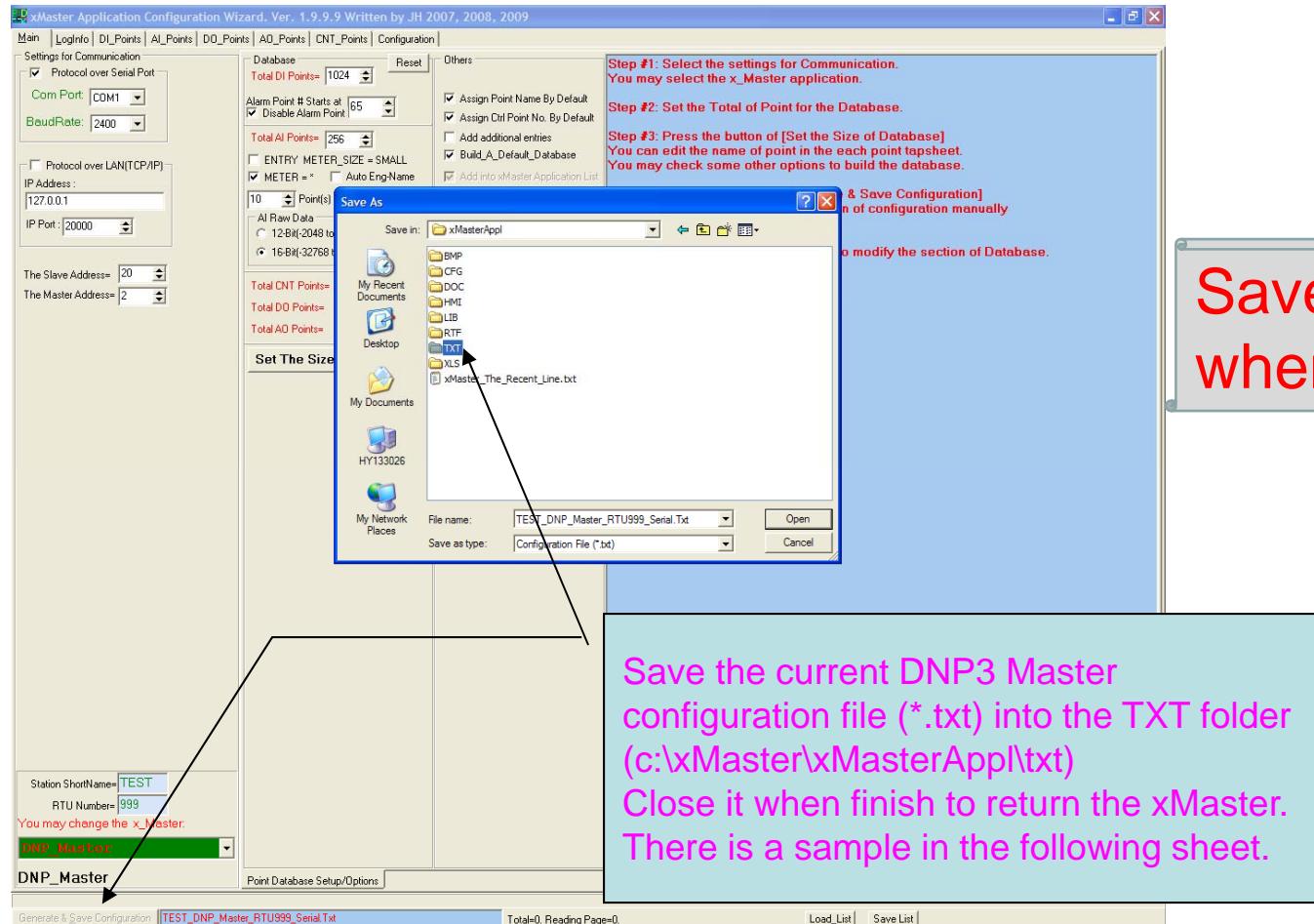
Make a new one for DNP3 Master



1. To Create a Point Database

continue

Make a new one for DNP3 Master



1. To Create a Point Database

continue

Master Application configuration is a Text based file that can be modified by any text editor (i.e. Notepad). Refer to Section 1.4 .13 to .20 in the manual (xMaster_Manual.pdf).

```

;ENTRY      SAVE_RUNNING_COUNTERS = YES
ENTRY      DEV_MASTER      = 2
;define the master end address
;ENTRY      DEV_LINK        = MODEM ATC1Q0E0S12=20S30=60 ATS37=6
ENTRY      DEV_LINK        = SERIAL
    PORT = 1
    BAUDRATE = 9600
    CONTROL_TIMEOUT = 6
    POLL_INTERVAL = 1000 300000
;
    DO_CTRL_MODE = NOACK
    DO_CTRL_MODE = YESACK
    DO_CTRL_MODE = SBO
    LINK_TIMEOUT = 15000
;
    MULTI_DROP_TIME_DELAY = 20 1234
SESSION = 0 1234
SESSION = 1 4321
;
PHONE_NO = 0,1234567890
PHONE_NO = 91234567890
PHONE_NO = PhoneBookFileName
PHONE_NO = @AUTOSITEINFO
;

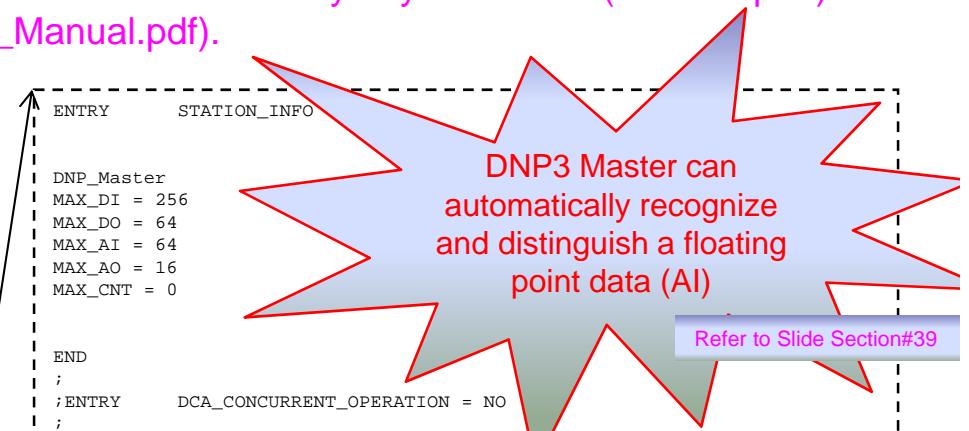
;ENTRY      DEV_LINK        = TCP/IP
MULTI_DROP_TIME_DELAY = 20
;
    TELECOMM_CH = YES
;
    MULT_LAN_IP_AUTO_SWITCH = YES
Dev1 = 0, 1234, 127.0.0.1 0.0.0.0, 20000
;
    POLL_INTERVAL = 1000 300000
;
    DO_CTRL_MODE = NOACK
    DO_CTRL_MODE = YESACK
    DO_CTRL_MODE = SBO
    CONTROL_TIMEOUT = 6
    LINK_TIMEOUT = 6000
END
;;
;0:::::::::::::::::::0
ENTRY      DEV_DATABASE = SIZE
SESSION = 0
;
    ENABLE_DO_CTRL_FEEDBACK_POLL = YES or NO
TIME_SYNC = YES or NO
;
;
    POLL_CLASS2 = NO
    POLL_CLASS3 = NO
    SAVE_RUNNING_CNT = YES
    READ_DNP_OBJ_RESPONSIVELY = YES
;
MAX_DI = 256
MAX_DO = 64
MAX_AI = 64
MAX_AO = 16
MAX_CNT = 0
;
END

```

A comment line starts with its 1st character of ;.

A new one for DNP3 Master

Max. Points of DI+DO+AI+AO+CNT = 16384



DNP3 Master can automatically recognize and distinguish a floating point data (AI)

Refer to Slide Section#39

```

ENTRY      STATION_INFO
;
DNP_Master
MAX_DI = 256
MAX_DO = 64
MAX_AI = 64
MAX_AO = 16
MAX_CNT = 0
;
END
;
;ENTRY      DCA_CONCURRENT_OPERATION = NO
;
ENTRY HMI_SYSTEM = c:\xMaster\HD\xxx
;ENTRY      INFO_FILE = XXX_RTU999_DNP_Master_Serial.Txt
;ENTRY      HMI_FILE = xx_HMI.Pge
;ENTRY      PLC_FILE = PLC_CMD_xxx.txt
;ENTRY      FREE_MEM = YES
ENTRY      METER_SIZE = BIG
;ENTRY      METER_SIZE = SMALL
;
ENDALL_AND_BUILD_A_DEFAULT_HMI_POINT_DB DI_PNT_NAME.TXT AI_PNT_NAME.TXT
;if you want to define the name of point you can put the name of point in a Text file of LIST_OF_STATUS_HMI_POINT_NAME.TXT and LIST_OF_ANALOG_HMI_POINT_NAME.TXT.
;In the file of LIST_OF_STATUS_HMI_POINT_NAME.TXT, the 1st line is to define the 1st DI point, 2nd line is for 2nd DI point and so on.
;The format of a line is
ssssssssssssssssss,1111111111111111,dd.
;The ss...s is the short name of point. The 111...1 is the long name/description. The dd is the address of its control point (DO) or -1 as no control.
;In the file of LIST_OF_ANALOG_HMI_POINT_NAME.TXT, the 1st line is to define the 1st AI point, 2nd line is for 2nd AI point and so on.
;The format of a line is
ssssssssssssssssss,1111111111111111,dd.
;The ss...s is the shortname of point. The 111...1 is the long name. The dd is the address of its control point (AO) or -1 as no control.
;Or uncheck [ ]Build_A_Default_Database and define the name of point in the Tab of points and generate the the current configuration and save it before exit.
;
ENDALL

```

1. To Create a Point Database

continue

```

LABEL_CONST Station_Name_Str xxx LoadShed RAS
LABEL_CONST Station_full_Name_Str xxx Station LoadShed RAS
;
LABEL_CONST Matrix_Title_Str xxx LoadShed RAS Facility
;
LABEL_CONST AREA_DCP_SITE RTU-A to xxxDCP
LABEL_CONST SCC_DCP_SITE RTU-B to yyyDCP
;
LABEL_CONST ACT01_Str xFT-A
LABEL_CONST ACT02_Str xTG
LABEL_CONST ACT03_Str xFM-A
LABEL_CONST ACT04_Str xFM-B
LABEL_CONST ACT05_Str xFM-C
LABEL_CONST ACT06_Str xSQ-A
LABEL_CONST ACT07_Str xOW-A&C
LABEL_CONST ACT08_Str xTG_60KV(xNY)
LABEL_CONST ACT09_Str xTP-A
LABEL_CONST ACT10_Str xTP-B
LABEL_CONST ACT11_Str xSY-A
LABEL_CONST ACT12_Str xSY-B&C
LABEL_CONST ACT13_Str xAL-B
LABEL_CONST ACT14_Str xALM-A
LABEL_CONST ACT15_Str xVO-B
LABEL_CONST ACT16_Str xVO-A
;
LABEL_CONST ACT17_Str xFD
LABEL_CONST ACT18_Str xLD
LABEL_CONST ACT19_Str xNY
LABEL_CONST ACT20_Str xSH
LABEL_CONST ACT21_Str xHA
LABEL_CONST ACT22_Str xVL
LABEL_CONST ACT23_Str xLC
LABEL_CONST ACT24_Str xTZ
LABEL_CONST ACT25_Str xMX
LABEL_CONST ACT26_Str xDY
LABEL_CONST ACT27_Str xWD
LABEL_CONST ACT28_Str xMR_5Lxx&yy
LABEL_CONST ACT29_Str Act29 (Spare)
LABEL_CONST ACT30_Str Act30 (Spare)
LABEL_CONST ACT31_Str Act31 (Spare)
LABEL_CONST ACT32_Str Act32 (Spare)
;

```

```

LABEL_CONST TE01_Str 500KV_G1_0s
LABEL_CONST TE02_Str 500KV_G2_2s
LABEL_CONST TE03_Str 500KV_G3_4s
LABEL_CONST TE04_Str 500KV_G4_6s
LABEL_CONST TE05_Str 500KV_G5_8s
LABEL_CONST TE06_Str 500KV_G6_10s
LABEL_CONST TE07_Str 230KV_G1_1s
LABEL_CONST TE08_Str 230KV_G2_11s
LABEL_CONST TE09_Str 230KV_G3_21s
LABEL_CONST TE10_Str 230KV_G4_31s
LABEL_CONST TE11_Str 230KV_G5_41s
LABEL_CONST TE12_Str 230KV_G6_51s
LABEL_CONST TE13_Str xUVLS_G1_0s
LABEL_CONST TE14_Str xUVLS_G2_2s
LABEL_CONST TE15_Str xUVLS_G3_4s
LABEL_CONST TE16_Str xUVLS_G4_6s
LABEL_CONST TE17_Str xUVLS_G5_8s
LABEL_CONST TE18_Str xUVLS_G6_10s
LABEL_CONST TE19_Str 5Lxx&yyOL_G1_0s
LABEL_CONST TE20_Str 5Lxx&yyOL_G2_2s
LABEL_CONST TE21_Str 5Lxx&yyOL_G3_4s
LABEL_CONST TE22_Str 5Lxx&yyOL_G4_6s
LABEL_CONST TE23_Str 5Lxx&yyOL_G5_8s
LABEL_CONST TE24_Str 5Lxx&yyOL_G6_10s

```

The following is some addition information/configuration.

```

ENTRY DEV_LINK = TCP/IP
; MB_DEV11 = 0, 11, 127.0.0.1 502, 51, 150
; 127.0.0.1 is local host running
MB_Slave to simulate PY/SY PLC.
; HMI WDT written into 40251 (51+200<-AO_MB_REG_START), PLC WDT Reg
40250(150+100<-AI_MB_REG_START)
;
POLL_INTERVAL = 250
END
;
ENTRY LOAD_SUB_CFG_FILE = xxx_LS_RAS_Point_Database.txt

```

A new one for Modbus/PLC Master

1. To Create a Point Database

continue

A new one for Modbus/PLC Master

```
;xxxx LS RAS Point Database
;
ENTRY      HMI_SYSTEM_NAME = c:\xMaster\HD\XXX_RAS
ENTRY      HMI_FILE = XXX_LS_RAS_HMI_MAIN.PGE
ENTRY      METER_SIZE = BIG
ENTRY      CHECK_DAYLIGHT_SAVING_TIME_IS_IN_EFFECT = YES
ENTRY      ALLOW_TO_REBOOT_IF_FAIL = NO
;
ENTRY      DEV_DATABASE = SIZE
SESSION = 0
;DI=====
MAX_DI = 176
;you also can use multi-command of Modbus as follows:
;Leading = PntNo MB-DataType MB-DataAddress TotalPnt          ScanFrequency
;MB_CMD = X    0X,1X,3X,4X StartFrom      Max.1024 for DI, 112 for Reg. 100 -  4294967295 ms
;PntNo can be X as default setting
;
MB_CMD = X    1X    1    48    1000
;MB ADDR 10001-10016, 10017-10032, 10033-10048, DI ADDR 00000-00015, 00016-00031, 00032-00047
;
MB_CMD = X    0X    1    128    1000
;MB ADDR 00001-00016, 00017-00032, 00033-00048, 00049-00064, 00065-00080, 00081-00096, 00097-00112, 00113-00128, 00113-00128
;DI ADDR 00048-00063, 00064-00079, 00080-00095, 00096-00111, 00112-00127, 00128-00143, 00144-00159, 00160-00175, 00160-00175
;
MB_CMD = X    4X    100   16   1000
;
;DO=====
MAX_DO = 128
;you also can use multi-command of Modbus as follows:
;Leading = PntNo MB-DataType MB-DataAddress TotalPnt          ScanFrequency
;MB_CMD = X    0X,4X StartFrom      Max.1024 for DO, 112 for Reg.
;
MB_CMD = X    0X        1        128
;MB ADDR 00001-00016, 00017-00032, 00033-00048, 00049-00064, 00065-00080, 00081-00096, 00097-00112, 00113-00128
;DO ADDR 00000-00015, 00016-00031, 00032-00047, 00048-00063, 00064-00079, 00080-00095, 00096-00111, 00112-00127
;
MB_CMD = X    4X        100       16
;
;AI=====
MAX_AI = 200
;you also can use multi-command of Modbus as follows:
;Leading = PntNo MB-DataType MB-DataAddress TotalPnt          ScanFrequency
;MB_CMD = X    3X,4X      StartFrom      Max.112 for Reg.  100 -  4294967295 ms
;
MB_CMD = X    4X        100       100       1000
MB_CMD = X    4X        200       100       1000
;MB ADDR 40100 to 40299, AI ADDR 00000 TO 00199
;
MB_CMD = X    3X        1        128       2000
;
```

1. To Create a Point Database

continue

A new one for Modbus/PLC Master

```
;AO=====
;      MAX_AO = 77
;you also can use multi-command of Modbus as follows:
;Leading = PntNo MB-Datatype MB-DataAddress TotalPnt
;MB_CMD = X    4X          StartFrom    Max.112 for Reg.
;
;MB_CMD = X    4X          200          52
;MB ADDR 40200 to 40251, AO ADDR 00000 TO 00051
;
;MB_CMD = X    4X          261          2
;MB ADDR 40261 to 40262, AO ADDR 00052 TO 00053
;
;MB_CMD = X    4X          161          23
;MB ADDR 40161 to 40183, AO ADDR 00054 TO 00076
;
;
;BR16=====
;      MAX_BR16 = 10
;you also can use multi-command of Modbus as follows:
;Leading = PntNo MB-Datatype MB-DataAddress TotalPnt      ScanFrequency
;MB_CMD = X    3X,4X      StartFrom    Max.112 for Reg.   100 - 4294967295 ms
;
;MB_CMD = X    4X          501          10          1000
;MB ADDR 40501 to 40510, BR16 ADDR 00000 TO 00009
;
;=====
;      MAX_BR32 = 0
;you also can use multi-command of Modbus as follows:
;Leading = PntNo MB-Datatype MB-DataAddress TotalPnt      ScanFrequency
;MB_CMD = X    3X,4X      StartFrom    Max.112 for Reg.   100 - 4294967295 ms
;
;MB_CMD = X    4X          100          0          2000
;
;      MAX_FR = 0
;you also can use multi-command of Modbus as follows:
;Leading = PntNo MB-Datatype MB-DataAddress TotalPnt      ScanFrequency
;MB_CMD = X    3X,4X      StartFrom    Max.112 for Reg.   100 - 4294967295 ms
;
;MB_CMD = X    4X          100          0          2000
;
;      ENABLE_DO_CTRL_FEEDBACK_POLL = YES or NO
;      MODBUS_32BIT = YES
;      MODBUS_32BIT = NO
;      If YES, the 2nd Word(16bit) is the Bit31-24 of 32bit data, otherwise is Bit15-00 of 32bit data.
;
;Note: for Modbus data collection application, you may have to remove the flag of comment out: ;
;      and define xxx_START= xx xx accordingly. The default settings may not work for your application.
;
;      ENABLE_READING_PLAIN_STATE = YES
;Note: Make sure MB Slave supports Modbus function code 0x11(17). It reads PLC state of RUN or STOP.
;
;      END
;
```

1. To Create a Point Database

continue

A new one for Modbus/PLC Master

```
-----  
ENTRY      DEV_DATABASE = SIZE  
;  
SESSION = 1  
;DI=====  
    MAX_DI = 176  
;you also can use mult-command of Modbus as follows:  
;Leading = PntNo MB-DataType MB-DataAddress TotalPnt          ScanFrequency  
;MB_CMD = X      0X,1X,3X,4X StartFrom      Max.1024 for DI, 112 for Reg. 100 - 4294967295 ms  
;  
;PntNo can be X as default setting  
;  
MB_CMD = X      1X      1     48   1000  
;MB ADDR 10001-10016, 10017-10032, 10033-10048, DI ADDR 00000-00015, 00016-00031, 00032-00047  
;  
MB_CMD = X      0X      1     128   1000  
;MB ADDR 00001-00016, 00017-00032, 00033-00048, 00049-00064, 00065-00080, 00081-00096, 00097-00112, 00113-00128, 00113-00128  
;DI ADDR 00048-00063, 00064-00079, 00080-00095, 00096-00111, 00112-00127, 00128-00143, 00144-00159, 00160-00175, 00160-00175  
;  
;MB_CMD = X      4X      100   16   1000  
;  
;DO=====  
    MAX_DO = 128  
;you also can use mult-command of Modbus as follows:  
;Leading = PntNo MB-DataType MB-DataAddress TotalPnt  
;MB_CMD = X      0X,4X StartFrom      Max.1024 for DO, 112 for Reg.  
;  
MB_CMD = X      0X      1           128  
;MB ADDR 00001-00016, 00017-00032, 00033-00048, 00049-00064, 00065-00080, 00081-00096, 00097-00112, 00113-00128  
;DO ADDR 00000-00015, 00016-00031, 00032-00047, 00048-00063, 00064-00079, 00080-00095, 00096-00111, 00112-00127  
;  
;MB_CMD = X      4X      100       16  
;  
;AI=====  
    MAX_AI = 200  
;you also can use mult-command of Modbus as follows:  
;Leading = PntNo MB-DataType MB-DataAddress TotalPnt          ScanFrequency  
;MB_CMD = X      3X,4X      StartFrom      Max.112 for Reg.  100 - 4294967295 ms  
;  
MB_CMD = X      4X      100       100      1000  
MB_CMD = X      4X      200       100      1000  
;MB ADDR 40100 to 40299, AI ADDR 00000 TO 00199  
;  
;MB_CMD = X      3X      1           128   2000  
;  
-----
```

1. To Create a Point Database

continue

A new one for Modbus/PLC Master

```
;AO=====
;      MAX_AO = 77
;you also can use mult-command of Modbus as follows:
;Leading = PntNo MB-Datatype MB-DataAddress TotalPnt
;MB_CMD = X    4X          StartFrom    Max.112 for Reg.
;
;MB_CMD = X    4X          200          52
;MB ADDR 40200 to 40251, AO ADDR 00000 TO 00051
;
;MB_CMD = X    4X          261          2
;MB ADDR 40261 to 40262, AO ADDR 00052 TO 00053
;
;MB_CMD = X    4X          161          23
;MB ADDR 40161 to 40183, O ADDR 00054 TO 00076
;
;BR16=====
;      MAX_BR16 = 10
;you also can use mult-command of Modbus as follows:
;Leading = PntNo MB-Datatype MB-DataAddress TotalPnt      ScanFrequency
;MB_CMD = X    3X,4X      StartFrom    Max.112 for Reg.   100 - 4294967295 ms
;
;MB_CMD = X    4X          501          10    1000
;MB ADDR 40501 to 40510, BR16 ADDR 00000 TO 00009
;
;=====
;      MAX_BR32 = 0
;you also can use mult-command of Modbus as follows:
;Leading = PntNo MB-Datatype MB-DataAddress TotalPnt      ScanFrequency
;MB_CMD = X    3X,4X      StartFrom    Max.112 for Reg.   100 - 4294967295 ms
;
;MB_CMD = X    4X          100          0      2000
;
;MAX_FR = 0
;you also can use mult-command of Modbus as follows:
;Leading = PntNo MB-Datatype MB-DataAddress TotalPnt      ScanFrequency
;MB_CMD = X    3X,4X      StartFrom    Max.112 for Reg.   100 - 4294967295 ms
;
;MB_CMD = X    4X          100          0      2000
;
;      ENABLE_DO_CTRL_FEEDBACK_POLL = YES or NO
;      MODBUS_32BIT = YES
;      MODBUS_32BIT = NO
;      If YES, the 2nd Word(16bit) is the Bit31-24 of 32bit data, otherwise is Bit15-00 of 32bit data.
;
;Note: for Modbus data collection application, you may have to remove the flag of comment out: ;
;      and define xxx_START= xx xx accordingly. The default settings may not work for your application.
;
;      ENABLE_READING_PLAIN_STATE = YES
;Note: Make sure MB Slave supports Modbus function code 0x11(17). It reads PLC state of RUN or STOP.
;
;
;
;      END
;
```

1. To Create a Point Database

continue

A Typical Point Definition

```
;----- AI -----  
ENTRY NAME      = PSD_AI01  
FORMAT     = PSD_AI  
LONGNAME   = PSD:HMI_SV  
METER      = 1, 1  
PNT_ADDR   = 0  
//          PROCTYPE   = ANALOG MINUTE_HISTORY M=16  
//          PROCTYPE   = ANALOG MINUTE_HISTORY  
//          PROCTYPE   = ANALOG HOUR_HISTORY  
//          PROCTYPE   = ANALOG DAY_HISTORY  
;  
ENTRY NAME      = PSD_AI02  
LONGNAME   = PSD:HMI_SV  
FORMAT     = PSD_AI  
PNT_ADDR   = 0  
D_TYPE     = AI  
PROCTYPE   = AI  
METER      = 1, 2  
ENG_UNIT   = HEX  
DEF_ALARM  = YES  
ALARM_GROUP = 9  
;  
ENTRY NAME      = AI_001  
LONGNAME   = Analogue Input #1  
FORMAT     = AI  
PROCTYPE   = ANALOG MINUTE_HISTORY M=X-Y  
PNT_ADDR   = 0  
PNT_DEV    = 11  
D_TYPE     = AI  
PROCTYPE   = AI  
HI_EUVAL   = +32767.0  
LO_EUVAL   = -32768.0  
HI_SCALE   = +32767.0  
LO_SCALE   = -32768.0  
HI_WNLIM   = +1000.0  
LO_WNLIM   = -1000.0  
HI_ALLIM   = +1500.0  
LO_ALLIM   = -1500.0  
HI_RSLIM   = +32767.0  
LO_RSLIM   = -32768.0  
Z_DBAND   = 10  
SENSE_CHG  = YES  
METER      = 1, 3  
ENG_UNIT   = INT  
ALARM      = YES  
ALARM_GROUP = 9  
;
```

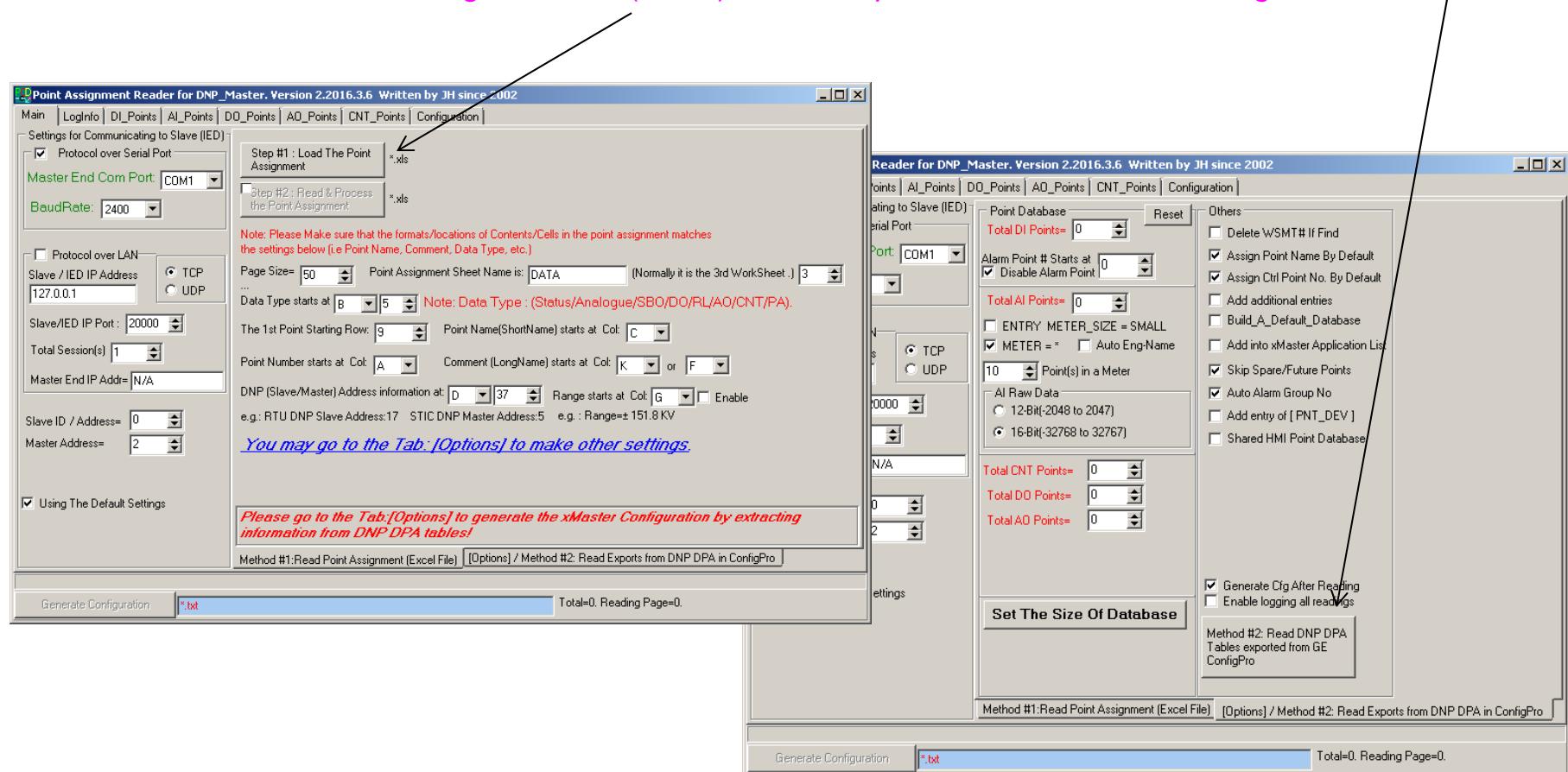
```
;----- DI -----  
ENTRY NAME      = PSD_ALM_G1  
FORMAT     = PSD_DI  
LONGNAME   = It is a PSD_Status to check Alm grp#1  
STATCONV   = NO  
PSD_DI_FUNC = CHK_ALARM_GROUP  
PNT_ADDR   = 0  
ALARM_GROUP = 1  
;  
ENTRY NAME      = PSD_DI01  
FORMAT     = PSD_DI  
LONGNAME   = It is a PSD_Status #1  
STATCONV   = NO  
PSD_DI_FUNC = HMI_SV  
PNT_ADDR   = 0  
ALARM      = YES  
;  
ENTRY NAME      = DI_0001  
LONGNAME   = Digital Input #1;  
FORMAT     = DI  
PROCTYPE   = ONOFF  
STATCONV   = NO  
PNT_ADDR   = 0  
CTRL_ADDR  = 0  
PNT_DEV    = 11  
ALARM_GROUP = 1  
;
```

1. To Create a Point Database

continue

Make a new one for DNP3 Master. Directly run C:\xMaster\PA_Cfg.exe.

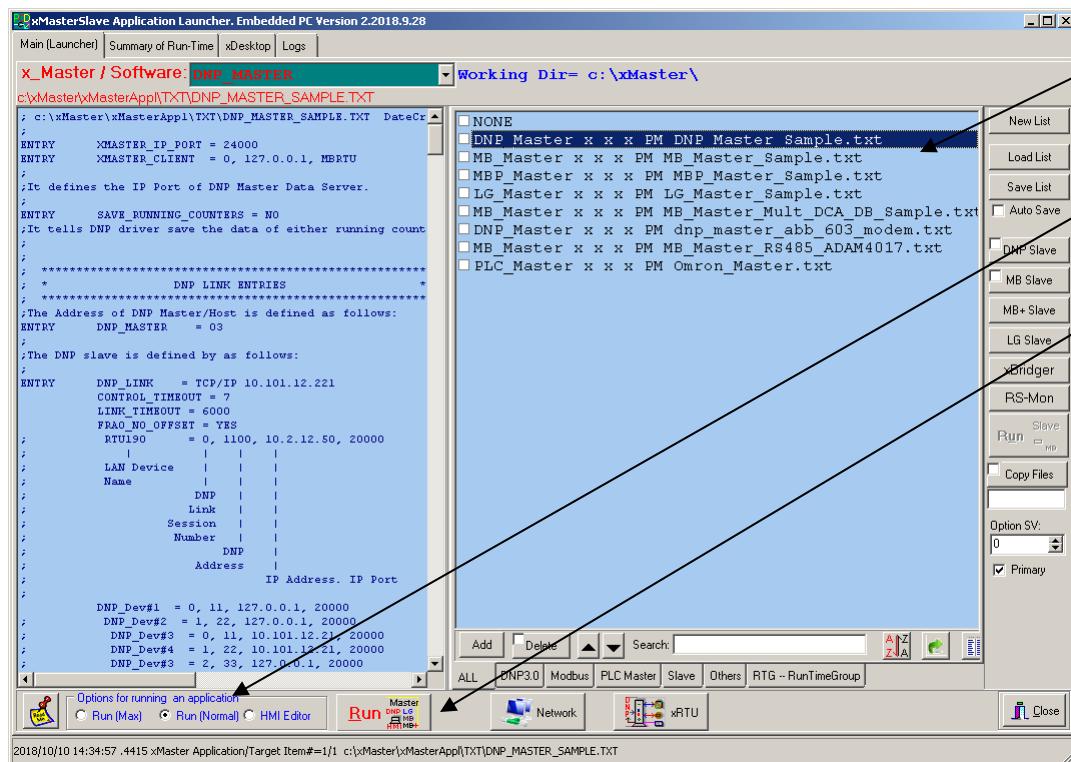
You either load a RTU Point assignment file (Excel) or files exported from GE RTU Configuration Tools -- DPA



1. To Create a Point Database

continue

It's ready to run DNP3 Master software to check and verify the communications and data from DNP3 slave.



Step1: Select an application.

Step2: Select the options for running an application.

Step3: press the button of Run x_Master.

Double-check:

- ? Communication settings: Serial BPS, 8N1? Or TCP IP Address/Port, IP Filter /Security Table
- ? DNP Master and Slave Address
- ? DNP (Obj/Var, Class#) Point database is assigned and mapped



2. To Share Point Database

```

;
ENTRY      SHARING_ALL_POINTS = YES
;
ENTRY      CLEANUP_SHARING_POINTS_AFTER_EXIT = YES
;
ENTRY      SHARING_ALL_HMI_POINTS = YES
;
ENTRY      STATION_INFO
xxx_SIP6_xMaster_Link_11_On_Link_18.Txt
END
;
;ENTRY      DCA_CONCURRENT_OPERATION = NO
;
;
ENTRY      LOAD_SUB_CFG_FILE = xxx_LS_RAS_Point_Database.txt

```

Share the value of Point Database with other application (i.e. xSlave, xRTU18) can access these points.

ENTRY	NAME	= U1-ALM#1
	LONGNAME	= M11-DI-4x1001.0
	FORMAT	= DI
	D_TYPE	= DI
	PROCTYPE	= ONOFF
	STATCONV	= NO
	PNT_DEV	= 11
	PNT_SITE	= 1
	PNT_ADDR	= 0
	AUTH_ST	= OPEN
	PNT_BIT	= 0
	CTRL_ADDR	= 0
	CTRL_BIT	= 0
	ALARM	= YES
	ALARM_GROUP	= 1
	SHARING_PNT	= YES

ENTRY	NAME	= AOU1_CN_FVO_SIC
	LONGNAME	= PSD:HMI_SV ,M11-AO-4x0101
	FORMAT	= PSD_AI
	PNT_ADDR	= SHARED
	; shared data from other application.	
	PNT_DEV	= 11
	CTRL_ADDR	= 0

x_dnpslave_tren_settings.txt:	x_dnpslave_tren_point_setup.txt: (the data file: x_dnpslave_tren_point.txt is similar, except the real-time value)					
x_dnpslave_tren_point.txt	DI:001	0	*	12F53_Radio_Comm_Failed	1	0
x_dnpslave_tren_smp.txt	DI:002	0	*	12F56_Radio_Comm_Failed	1	0
*	DI:003	0	*	12F57_Radio_Comm_Failed	1	0
*	DI:004	0	*	12F58_Radio_Comm_Failed	1	0
1000	DI:005	0	*	12F59_Radio_Comm_Failed	1	0
0	DI:006	0	*	Host_Radio_Comm_Failed	1	0
*	AI:001	0	*	CAP_12F53_A_AMP1	0	
	AI:002	0	*	CAP_12F53_B_AMP1	0	

The point database can be imported or shared from an application that uses a Text based file as a semaphore to exchange data with xMaster. Refer to Section 1.4.3/Note#6 in the manual and the revision Note #7 for xSlave, and Slides in Section 38 below.

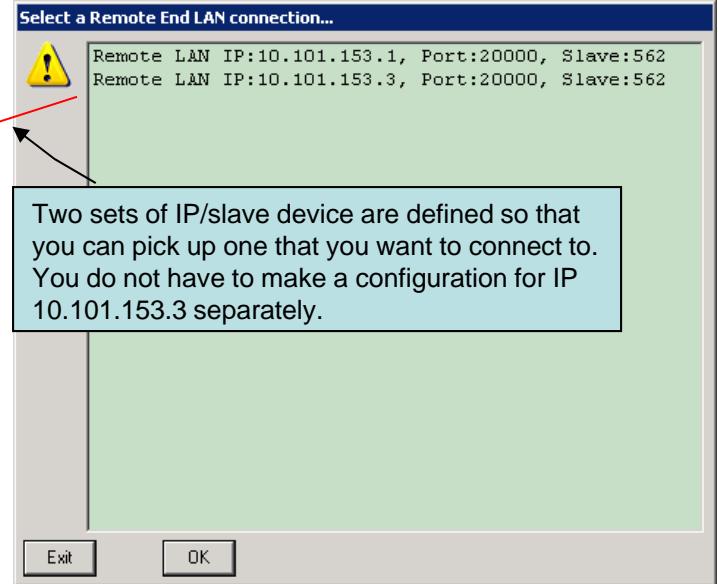
3. To Switch link connections/database (PY&SY communication)

Refer to Section 1.4.1 to .8 in the manual.

```
;  
;  
;  
;  
;  
; ENTRY      DEV_LINK      = TCP/IP 10.101.153.20  
; MULTI_DROP_TIME_DELAY = 20  
TELECOMM_CH = YES  
; MULT_LAN_IP_AUTO_SWITCH = YES  
Dev1 = 0, 562, 10.101.153.1 10.101.153.2, 20000  
Dev1 = 0, 562, 10.101.153.3 10.101.153.4, 20000  
POLL_INTERVAL = 1000 300000  
DO_CTRL_MODE = NOACK  
; DO_CTRL_MODE = YESACK  
; DO_CTRL_MODE = SBO  
; CONTROL_TIMEOUT = 6  
LINK_TIMEOUT = 6000  
  
END
```

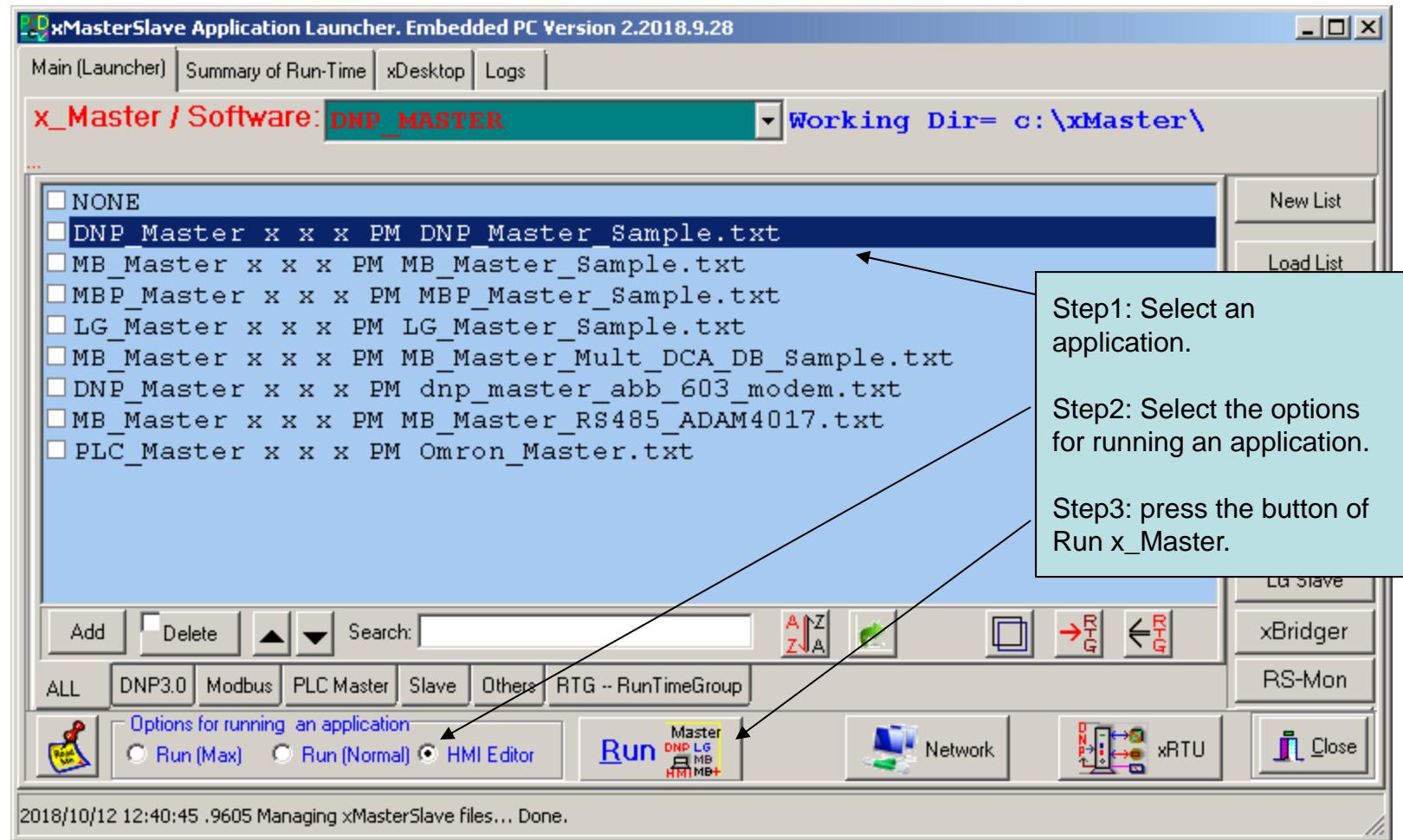
In-band a specific Master End IP Address.

PY: 10.101.153.1 or 10.101.153.3
SY: 10.101.153.2 or 10.101.153.4



4. To Edit a Display

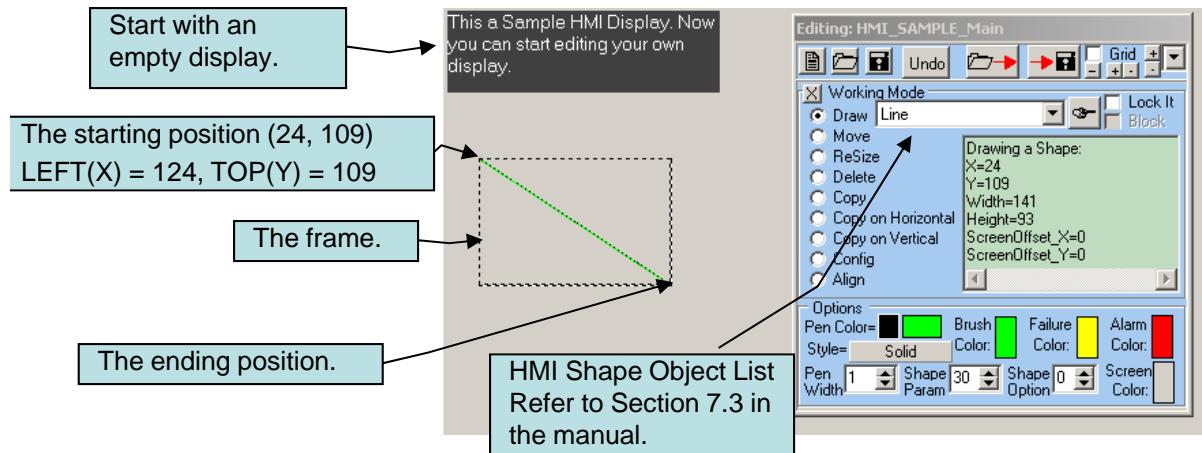
Run HMI Editor when you have a Point database.



4. To Edit a Display

continue

Run HMI Editor when you have a Point database. Refer to Section 7.2 and 7.3 in the manual.



Tips on using Mouse Keys

Left Key to start a selection to move/resize/delete/configure a single HMI shape object.

Moving mouse (do not press key) to relocate/change size/duplicate a shape.

Right Key to finish the current operation.
Use Arrow keys (i.e. \leftarrow or \rightarrow) to adjust X or Y position by +/- 1.

Step#1: Move the mouse to the position of (24, 109) and press the Left Key of the mouse.

Step#2: Hold the Left Key and move the mouse to the ending position.

Step#3: Release the Left Key. The Frame disappears.

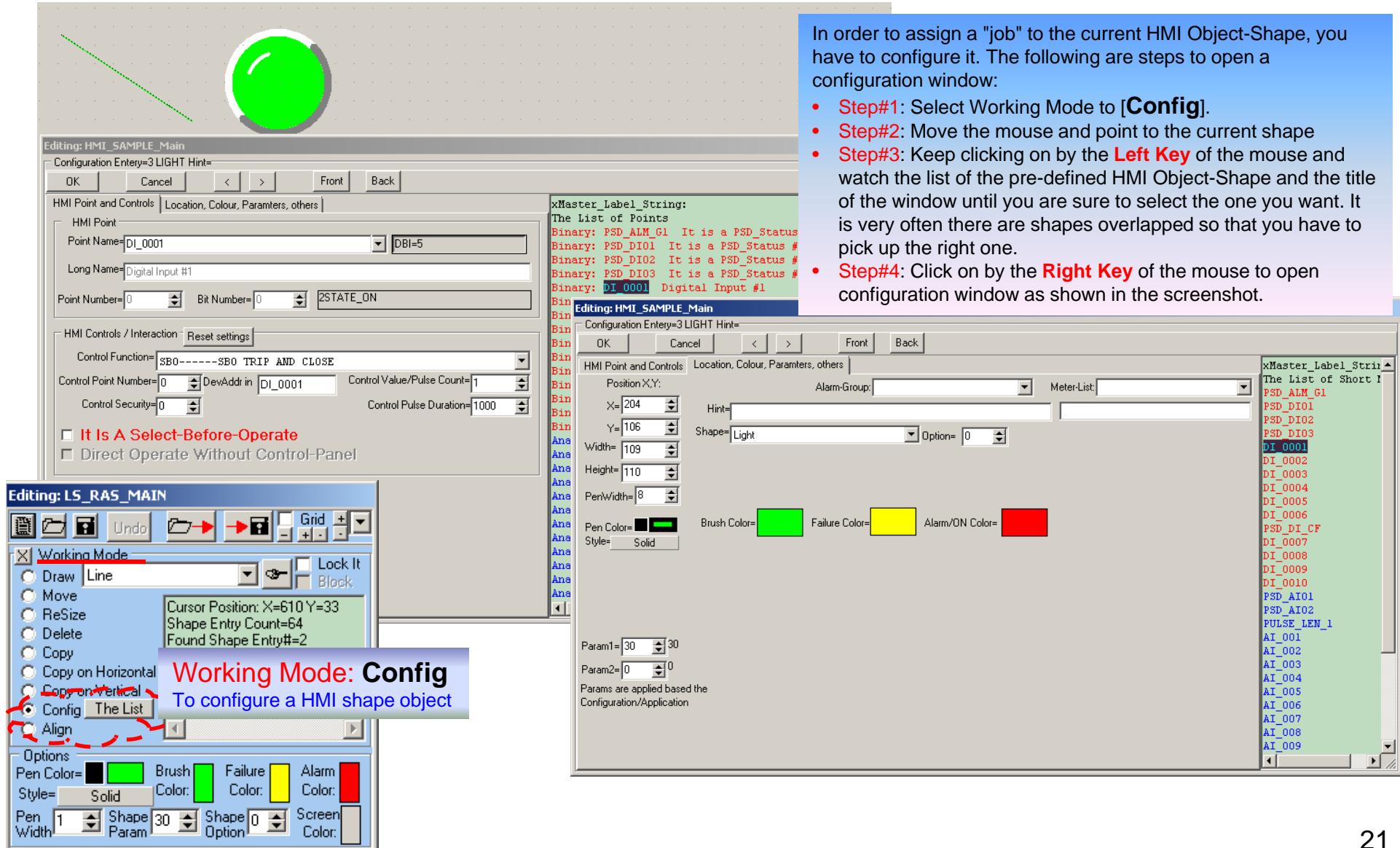
You can do a Double-Click on the current HMI Shape to directly open the configuration window to configure it. Also you can click on and drag the current HMI Shape by the Right-Key of the mouse.

It always appears a frame with DOT LINE around the current shape when you are either drawing or selecting. You can move the mouse to point to the current shape, then click on the Left Key to select the current shape. After the selection you can move the mouse again and the Frame moves and finally clicks on the Right Key to finish the process of either Move, or Resize, or Delete, or Copy, or Configure, or others in the Working Mode. **You can go back to what it was before by clicking the button of "Undo".**

Mode	Functioning
Draw	Drawing the shape that you select.
Move	Moving the current shape.
ReSize	Resizing the current shape.
Delete	Deleting the current shape.
Copy	Copying the current shape.
Copy on Horizontal	Copying the current shape on the Horizontal.
Copy on Vertical	Copying the current shape on the Vertical.
Config	Opening the window of the HMI Object-Shape Configuration.
Align	Aligning shapes with the option of Left/Right/Bottom/Top.
Lock it	Exclusively edit/draw the current shape.
Block	Operating on a block of shapes, including saving a block.

5. To Configure Display and Animation

Configure (making some animation) HMI shape object on a display when you run HMI Editor.
Refer to Section 7.2.5 and 7.3



5. To Configure Display and Animation

continue

Samples: Refer to DNP_Master_Sample.txt

The screenshot displays several windows related to configuration and monitoring:

- Top Left Window:** Shows a "RadioGroup #1" with two options: "LOAD FROM FILE:Sample" (selected) and "LOAD FROM FILE:Save".
- Top Right Window:** A table titled "DI-LIST:DI_0001:6:10" containing the following data:

Name	S
PSD_DI01	#
DI_0002	x
DI_0003	x
DI_0004	x
DI_0005	x
DI_0006	x
- Middle Left Window:** A text file named "c:\xMaster\xMasterApp\RTF\Shape_test.rtf" containing the following content:

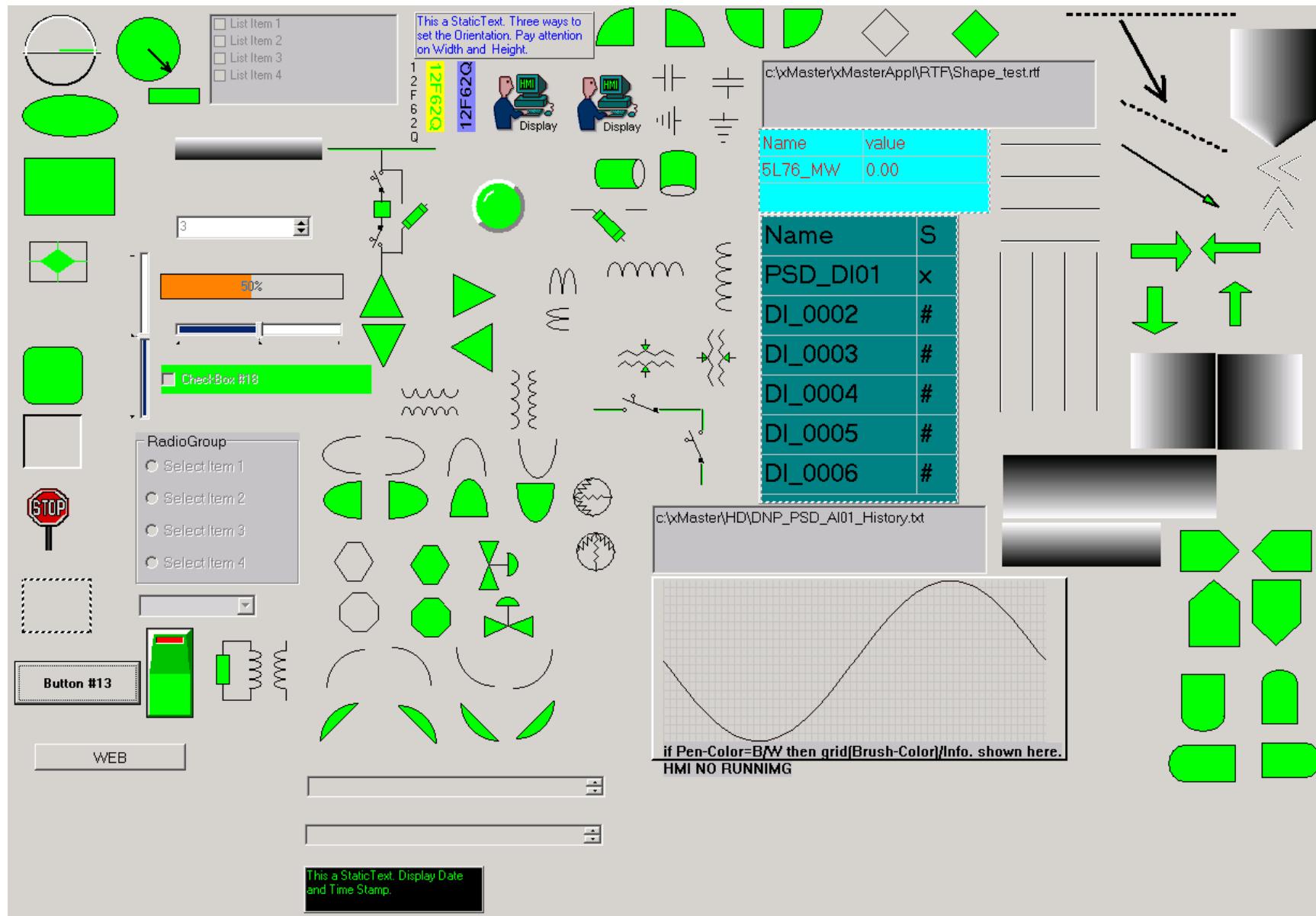
```
METER1
METERNAME1
PSD_AI01=dd.d
PSD_AI02=dd.d
AI_001=dd.d
AI_002=dd.d
AI_003=dd.d
AI_004=dd.d
AI_005=dd.d
AI_006=dd.d
AI_007=dd.d
AI_008=dd.d
```
- Middle Right Window:** A table titled "AI-LIST:AI_001:6:10" which is currently empty.
- Bottom Right Window:** A software interface titled "x_Master / Software [DNP_MASTER]" showing a configuration file "c:\xMaster\xMasterApp\RTF\NMP_MASTER_SAMPLE.TXT". The file contains the following configuration:

```
MASTER_IP_PORT = 24000
MASTER_IP_CLIENT = 0, 127.0.0.1, 0
; defines the IP Port of DNP Master Data Server
; tell DNP driver save the data of either run
; ***** DNP LINE SETTINGS *****
; Address of DNP Master/Slave is defined as follows
; DNP_MASTER = 0
; DNP slave is defined by as follows:
; TCP/IP
; CONTROL_TIMEOUT = 7
; LINE_TIMEOUT = 10000
; READ_NO_OFFSET = YES
; POLL_INTERVAL = 1000 00000
; LINE_TIMEOUT = 10000
; POINT_OFFSET = 0
; MULTI_POLL_TIME_DELAY = 20
; RTVIPO = 0, 1100, 10.2.12.50, 20
; LAM Device
; Name
; Sub
; Link
; Session
; Number
```
- Bottom Left Window:** An empty window titled "ALARM-LIST".

5. To Configure Display and Animation

continue

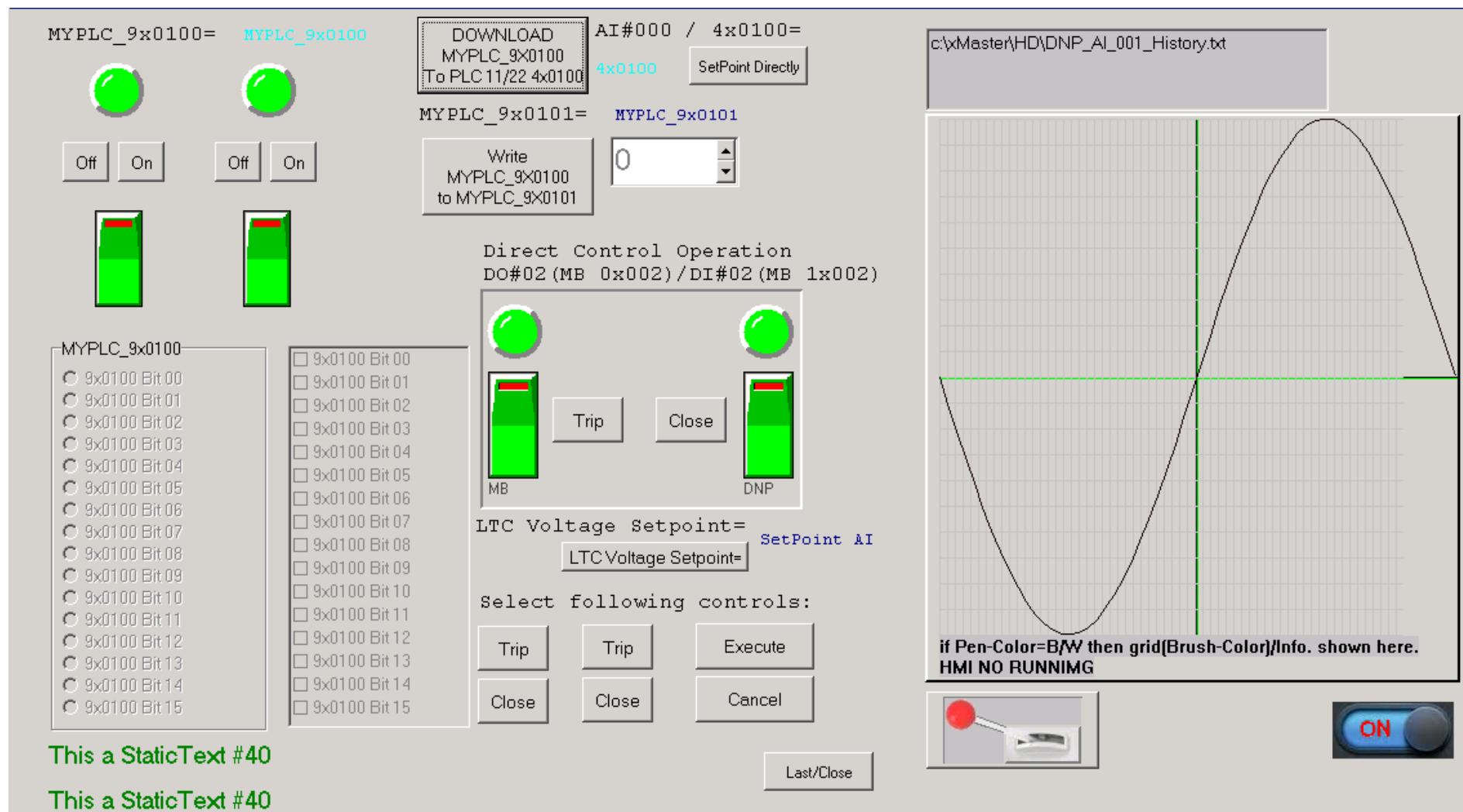
Samples: Refer to DNP_Master_Sample.txt



5. To Configure Display and Animation

continue

Samples: Refer to DNP_Master_Sample.txt



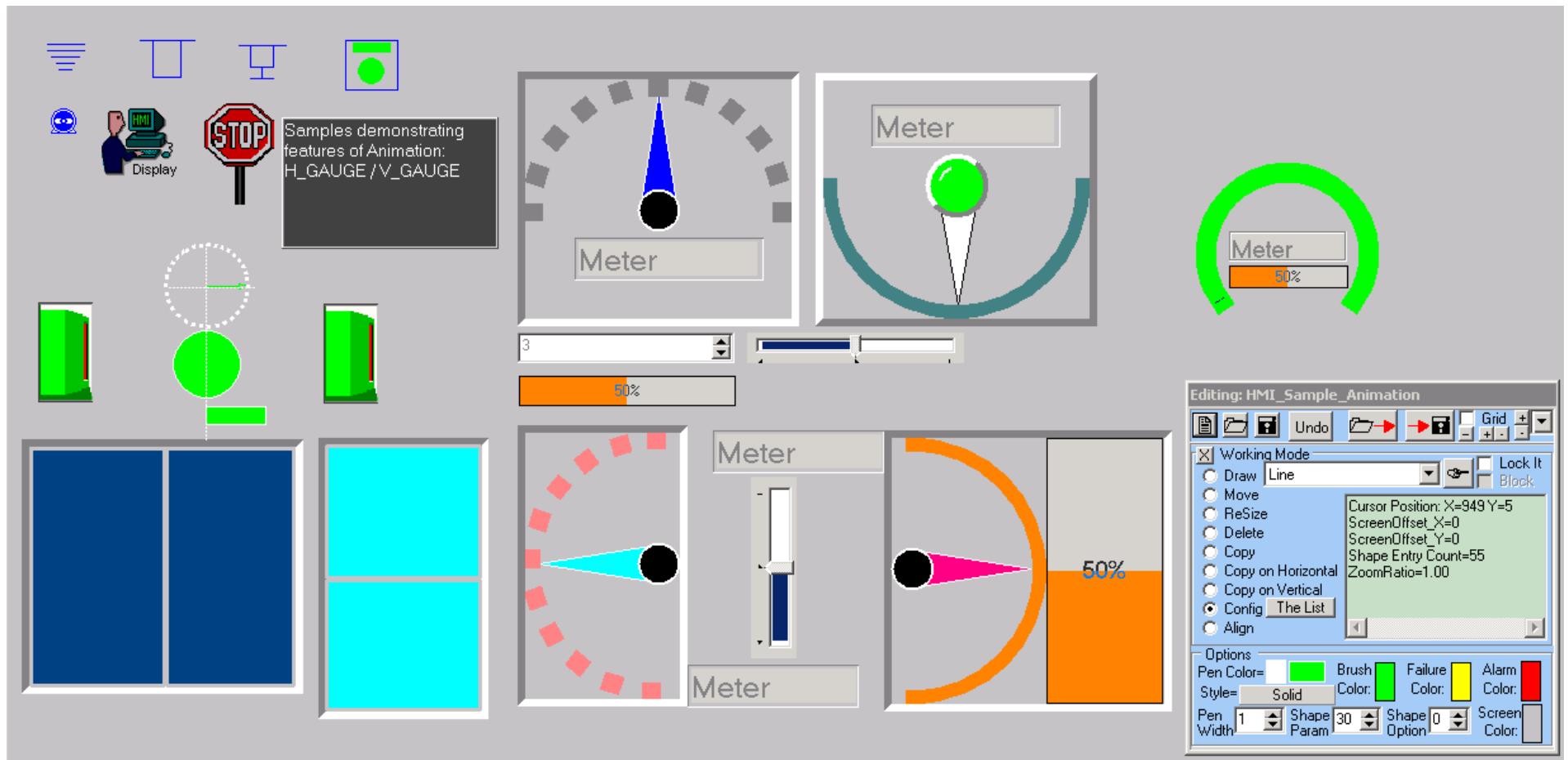
This a StaticText #40

This a StaticText #40

5. To Configure Display and Animation

continue

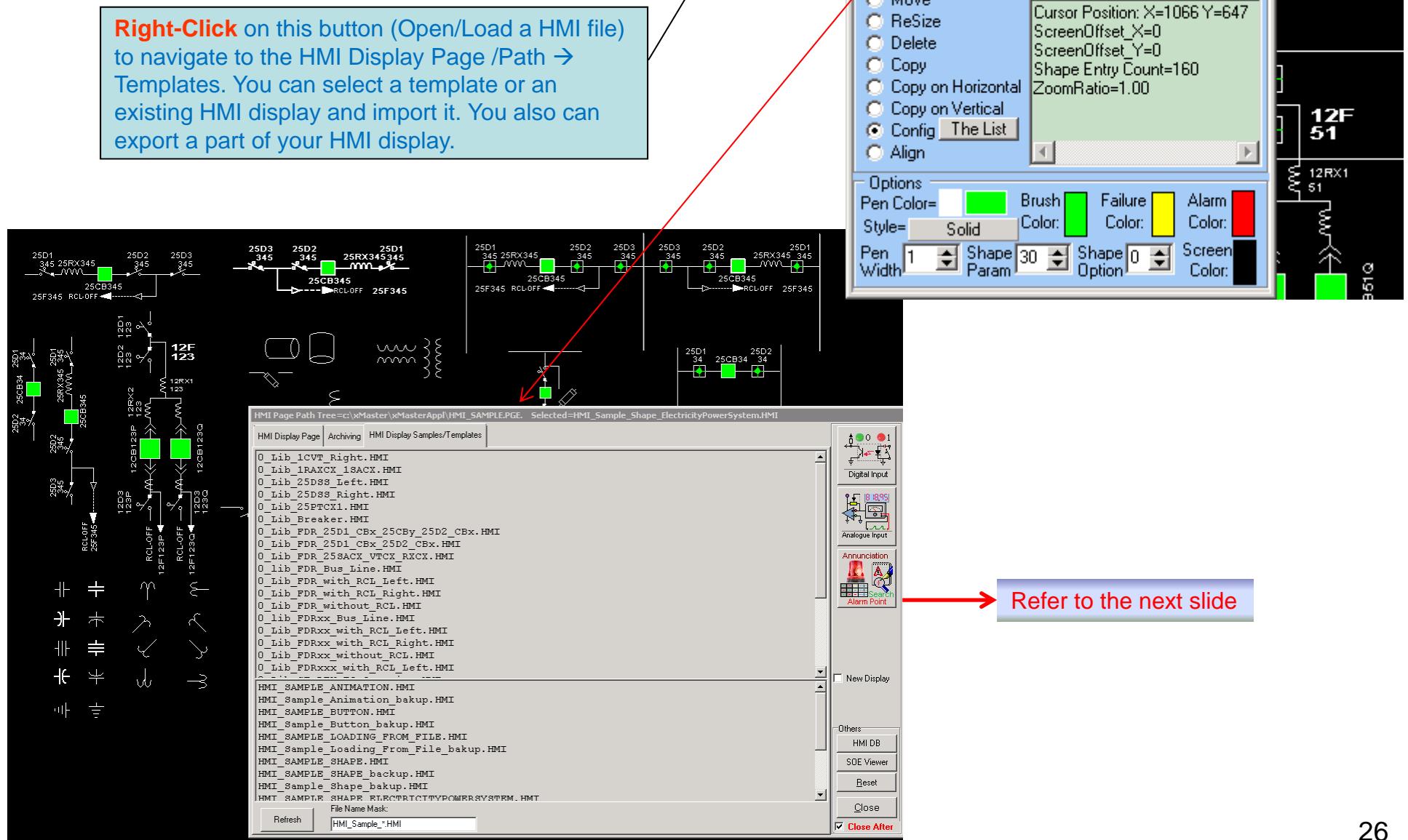
Samples: Refer to DNP_Master_Sample.txt



5. To Configure Display and Animation

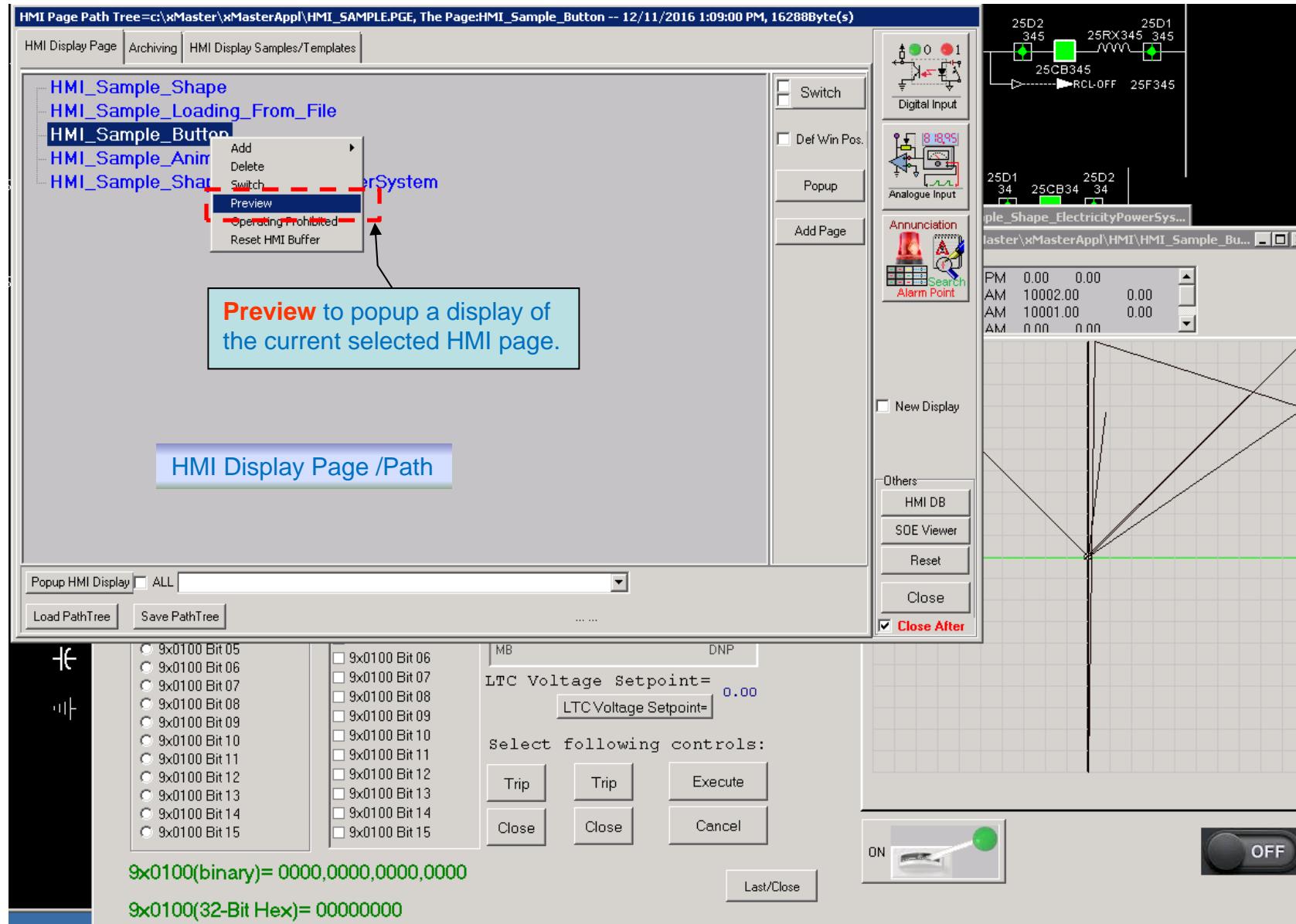
continue

Samples: Refer to DNP_Master_Sample.txt



6. To Test HMI Display and Animation

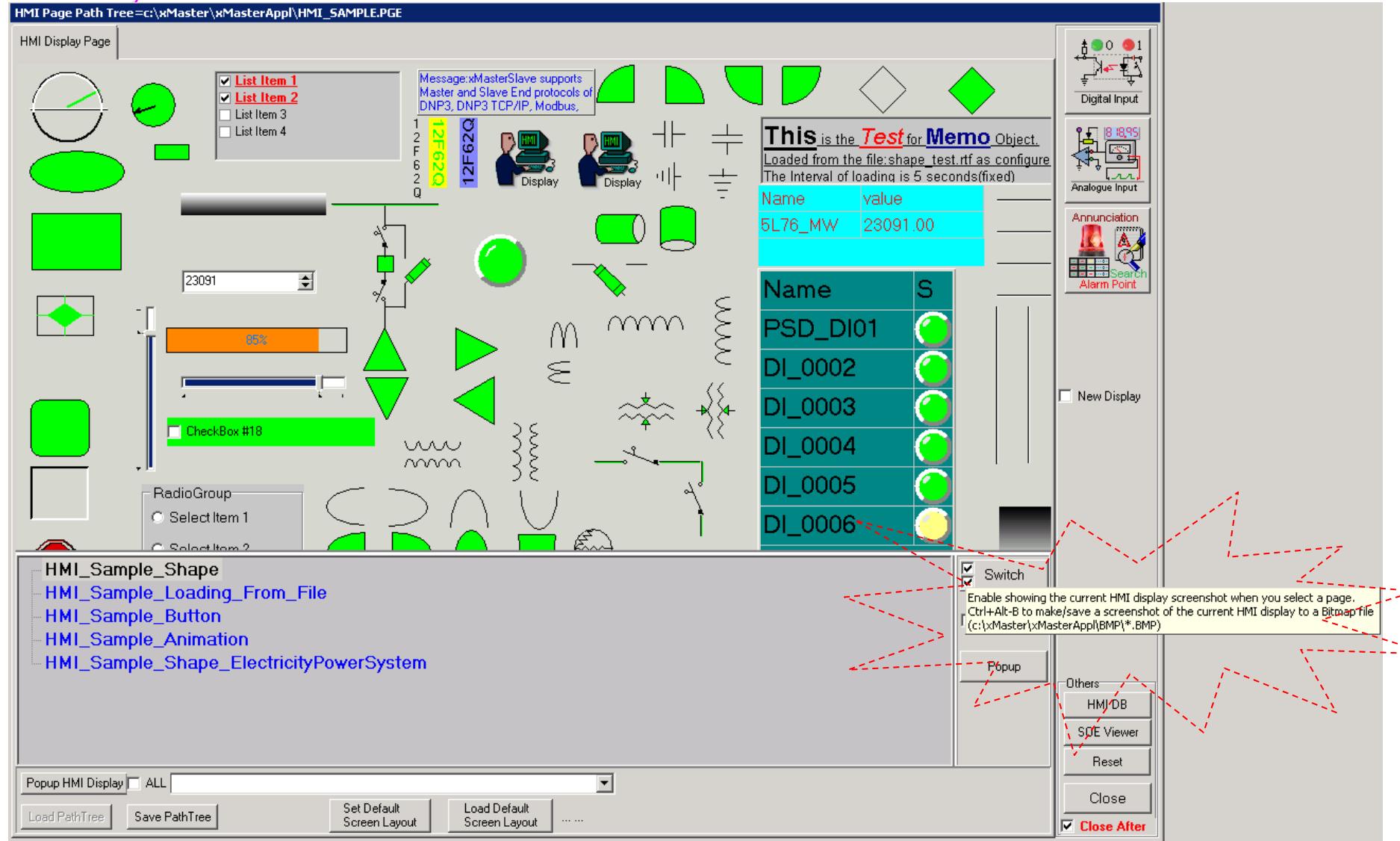
Samples: Refer to DNP_Master_Sample.txt



6. To Test HMI Display and Animation

continue

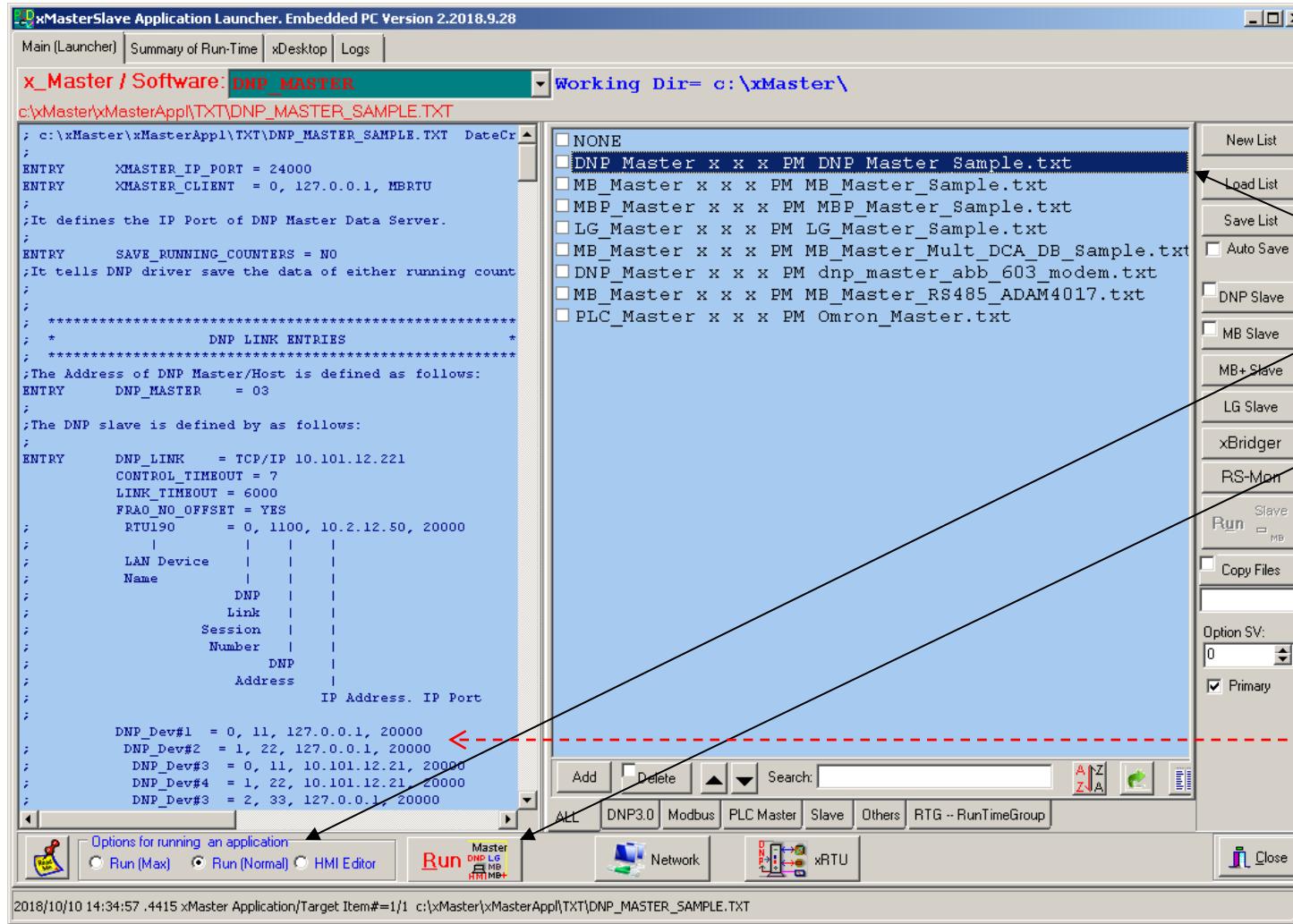
The screen-shot of a HMI display can be viewed in HMI Page Path if you enable it.
Press keys of Ctrl + Alt + B to make a screen-shot.



6. To Test HMI Display and Animation

continue

It's ready to **RUN** DNP3 Master software to check and verify your configuration.



Step1: Select an application.

Step2: Select the options for running an application.

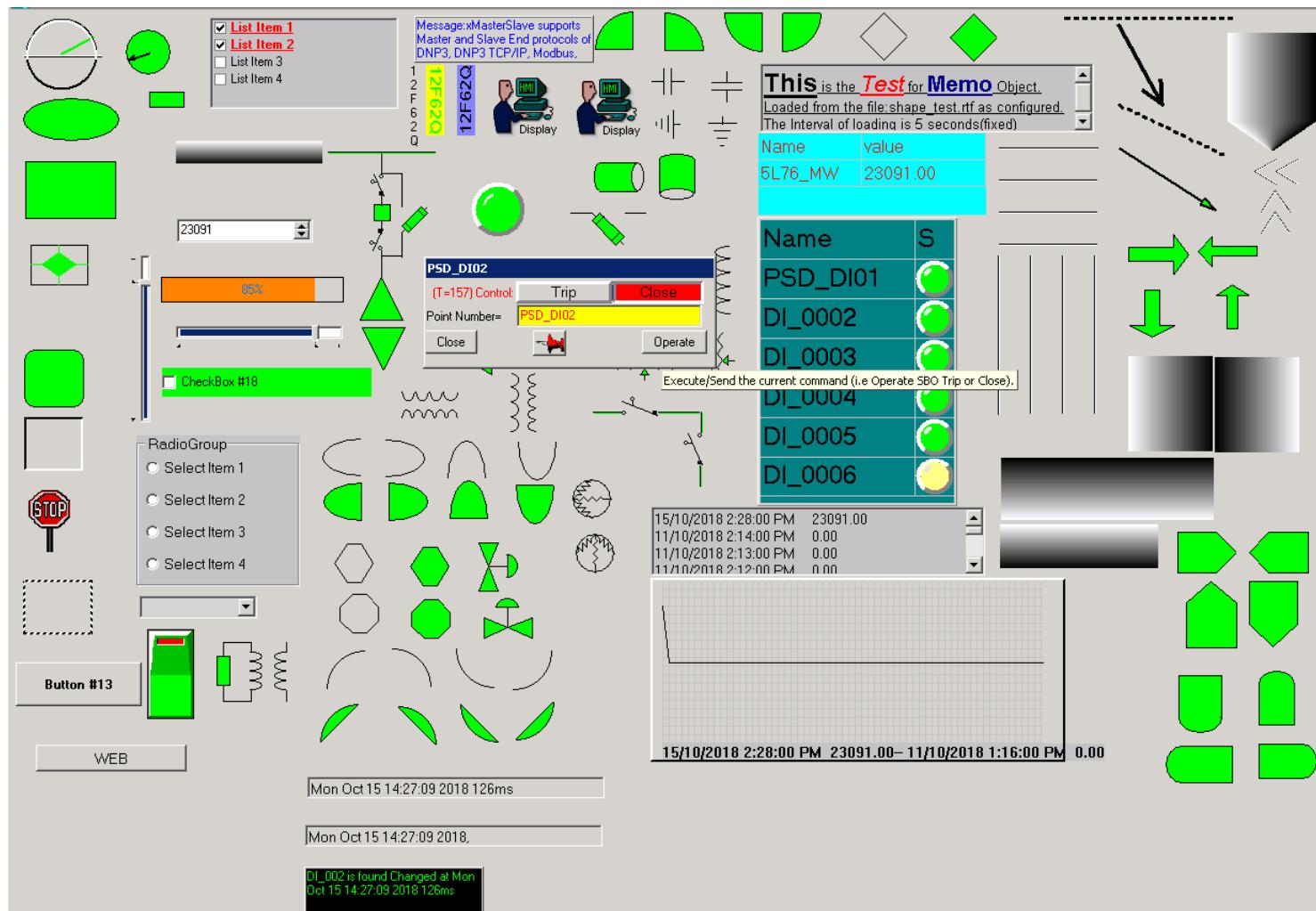
Step3: press the button of Run x_Master.

To locally test a Master or a Slave, you can define the Slave IP as 127.0.0.1 in the configuration of Master Application (refer to Slide Section1). Run both Master and Slave application on the same PC.

6. To Test HMI Display and Animation

continue

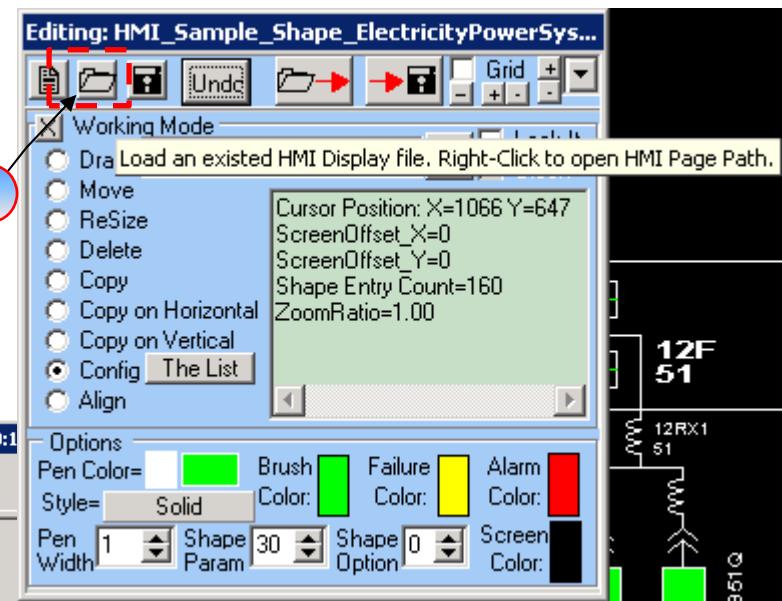
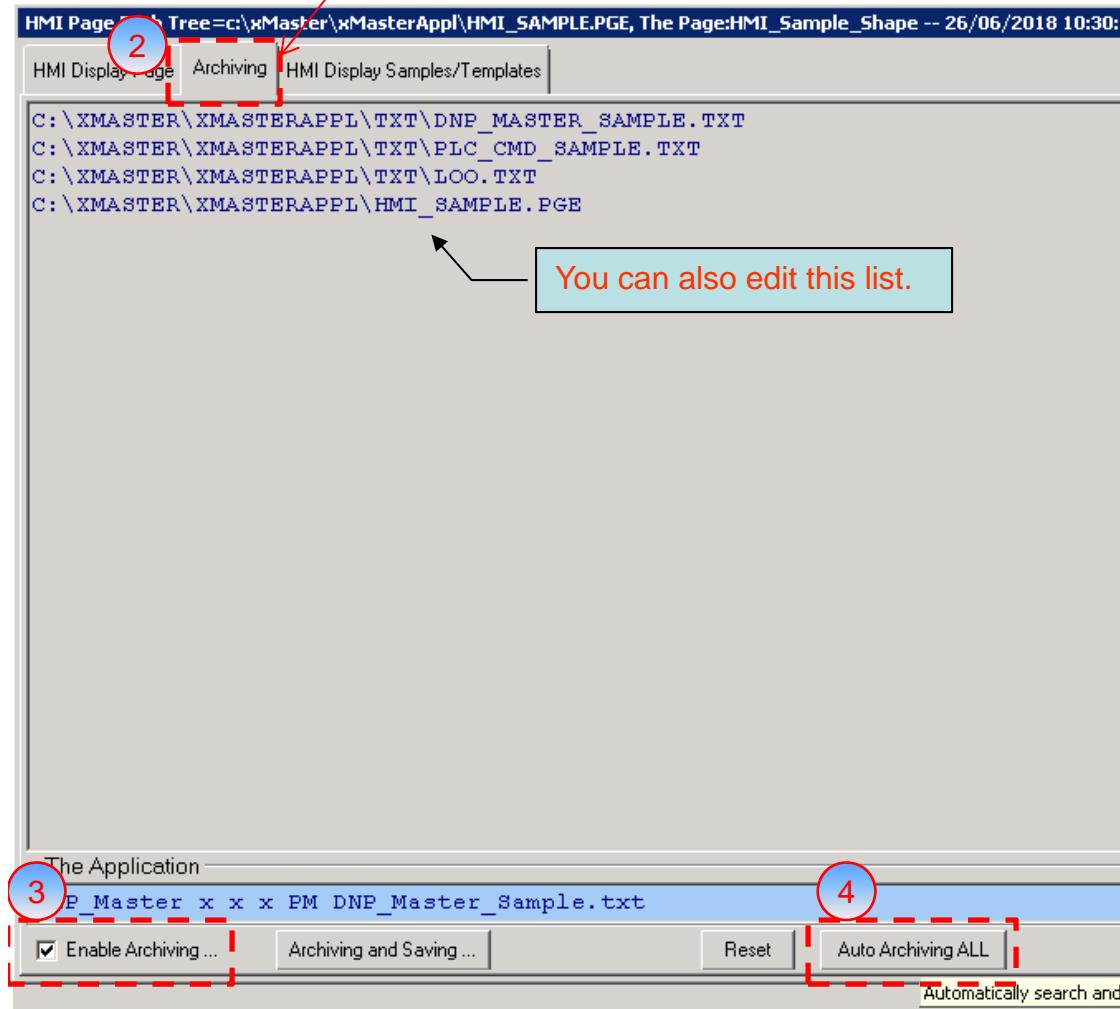
Samples: Refer to DNP_Master_Sample.txt



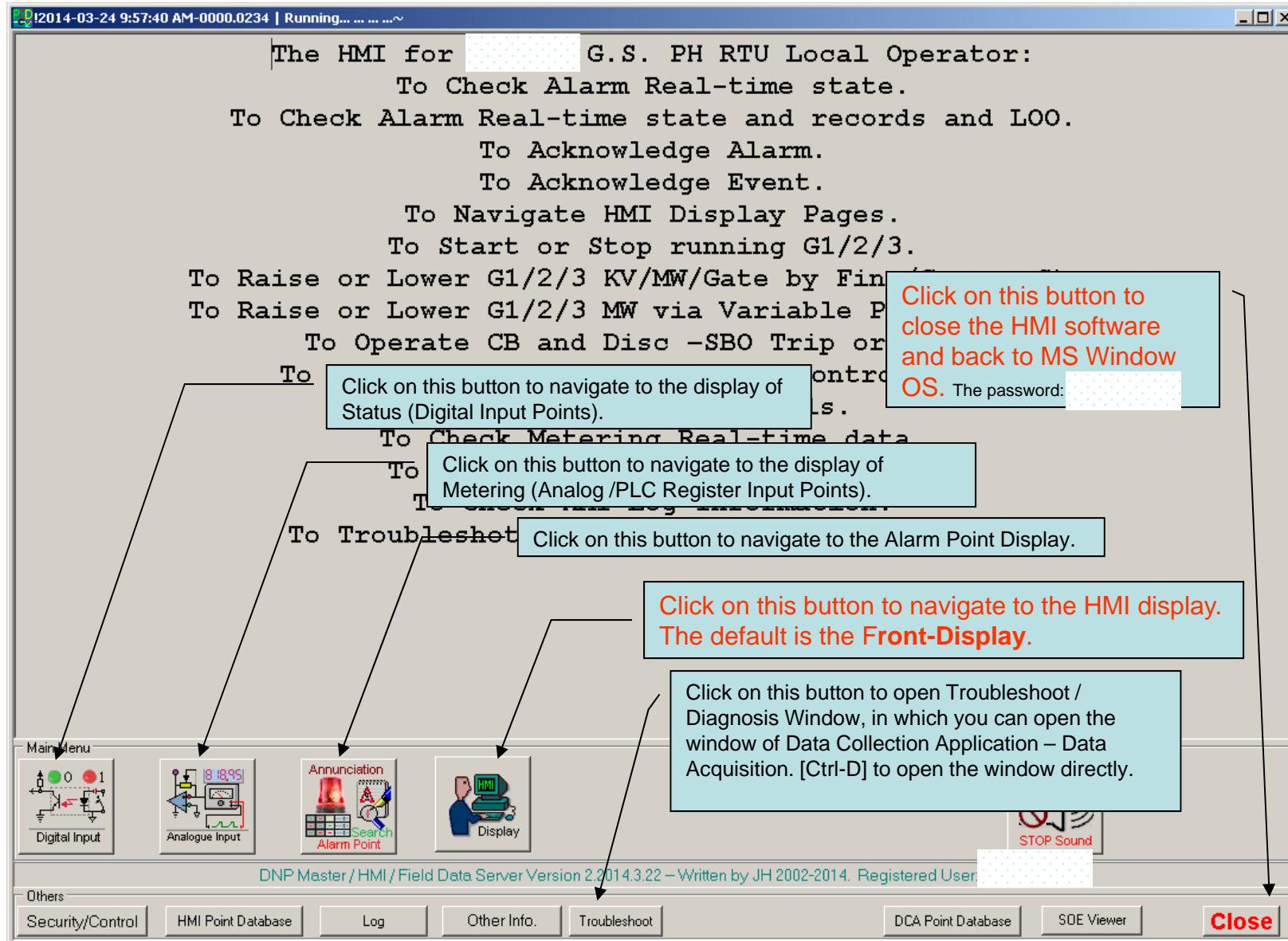
7. To Archive Project

Samples: Refer to DNP_Master_Sample.txt

Start edit your displays (project) – refer to slides in Section 4.
Right-Click on this button to navigate to the HMI Display Page /Path → Archiving → [x]Enable Archiving → [Auto Archiving ALL] (4 Steps).



8. To Navigate HMI Display Pages

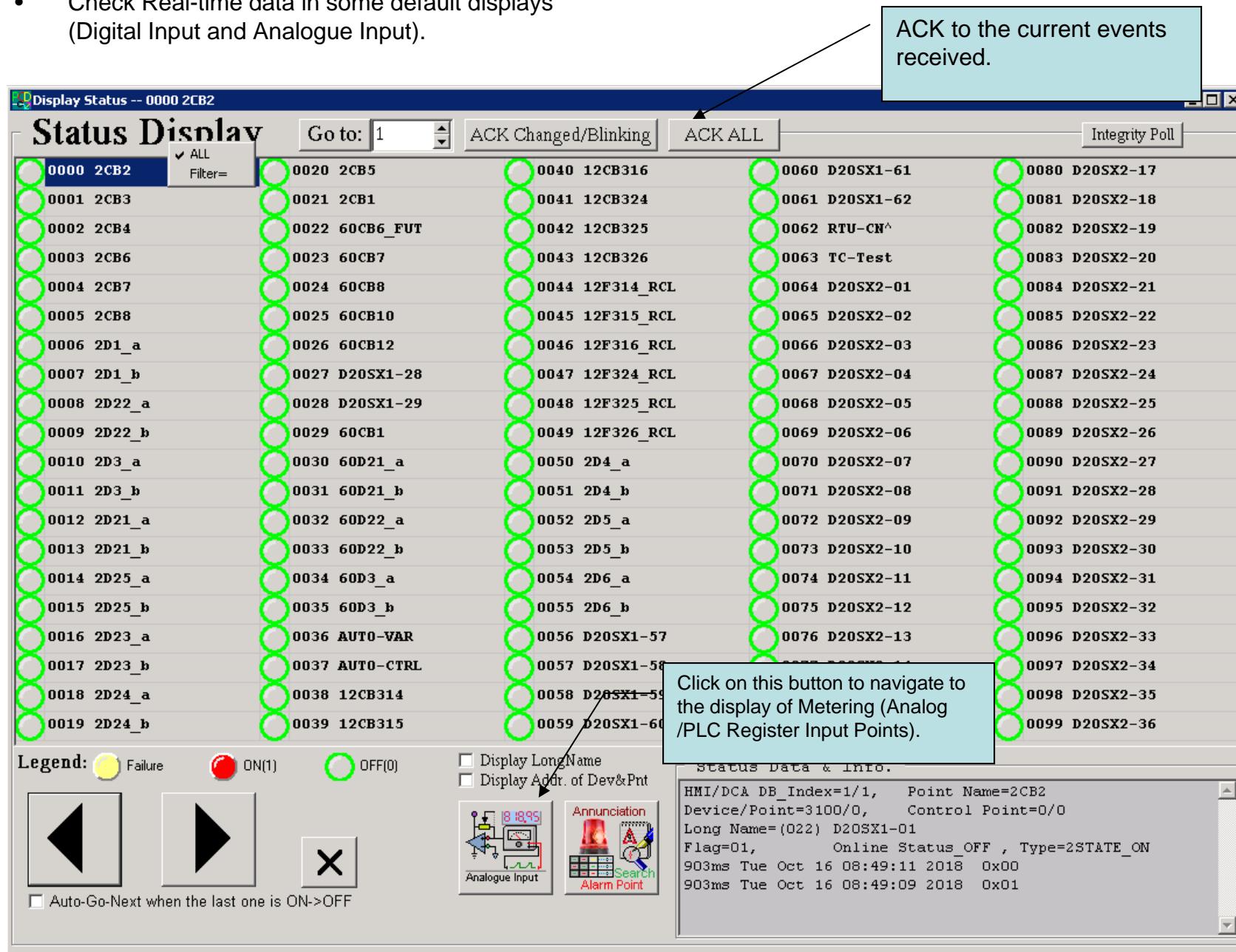


The main
MENU
display.

8. To Navigate HMI Display Pages

continue

- Check Real-time data in some default displays
(Digital Input and Analogue Input).



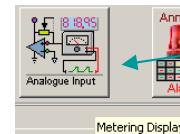
8. To Navigate HMI Display Pages

continue

- Check Real-time data in some default displays
(Digital Input and Analogue Input).

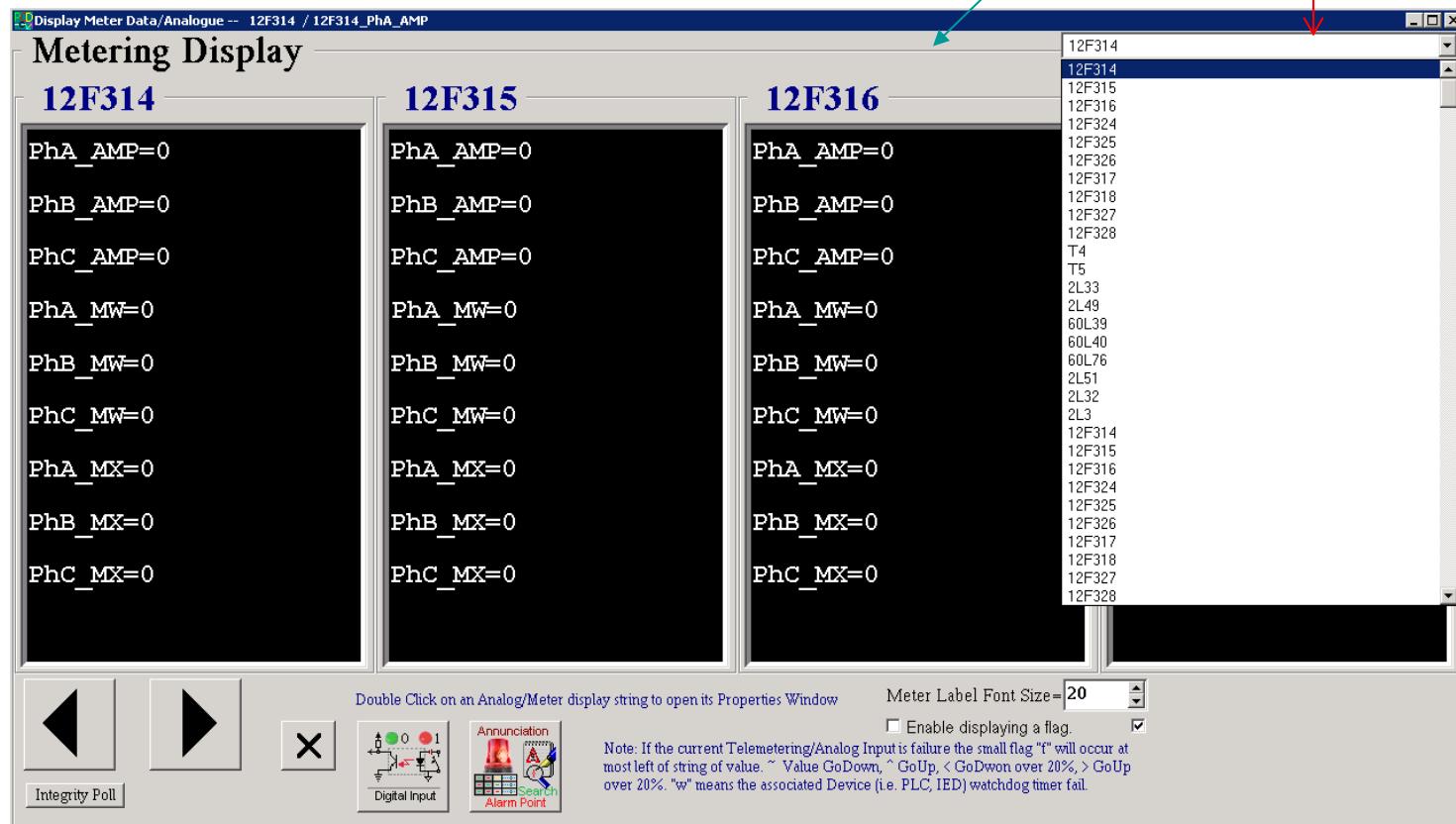


Right click on the button of [Pages] to popup a menu you can open a separate window of the metering.



To go to the display of Metering points, press the button of [Analogue Point].

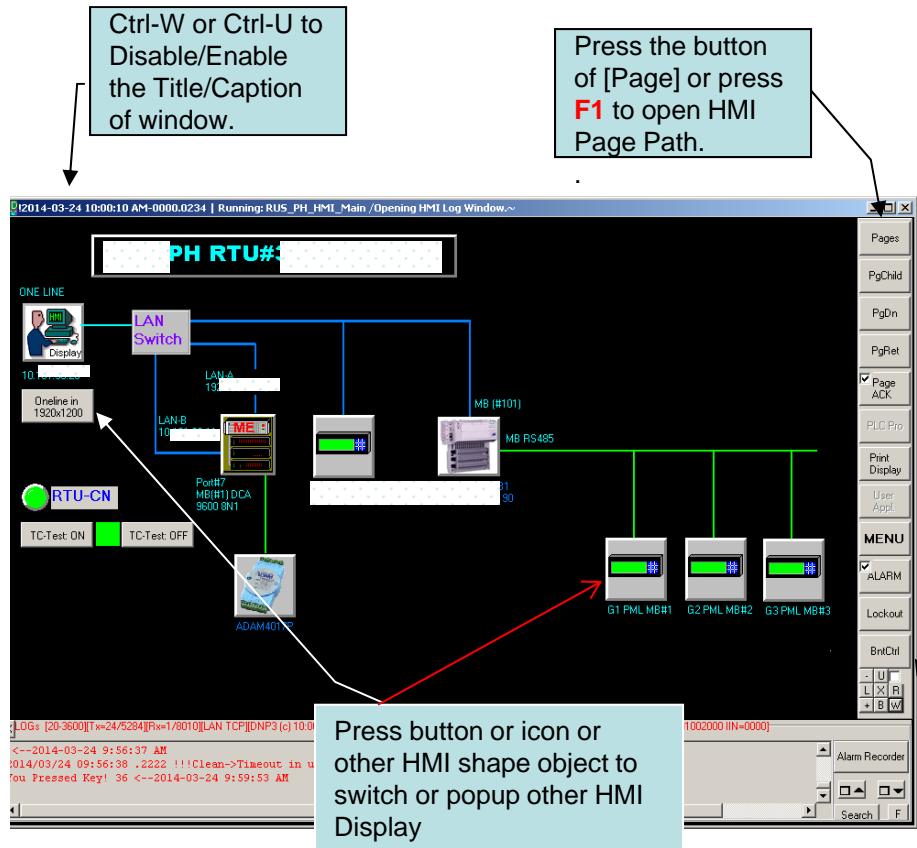
Click on the frame of display to popup a list and you can select a display item.



8. To Navigate HMI Display Pages

continue

A Front-Display and HMI Page Path



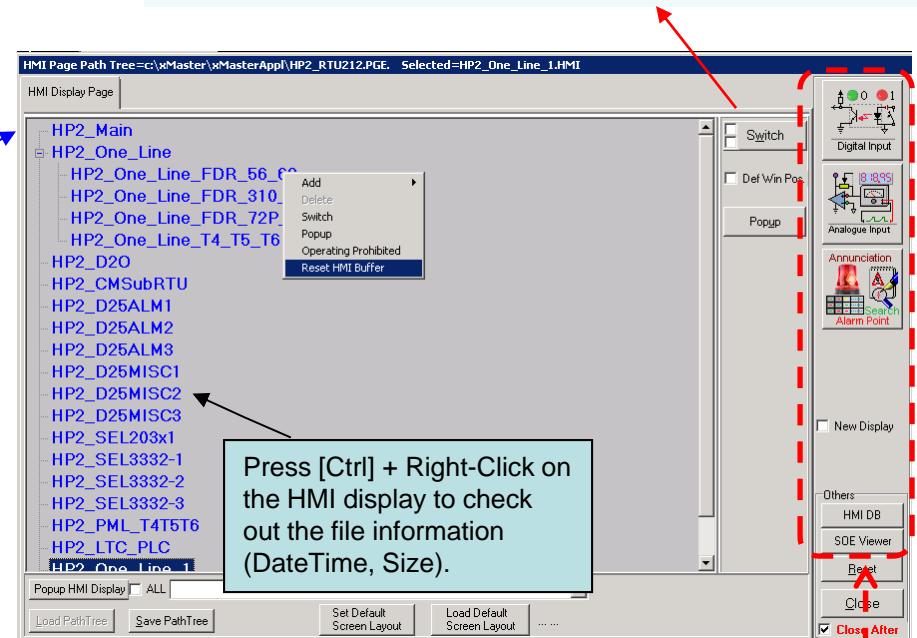
To Navigate (Switch) a display page:

Step 1:

Left-click the name of page (Select the current page).

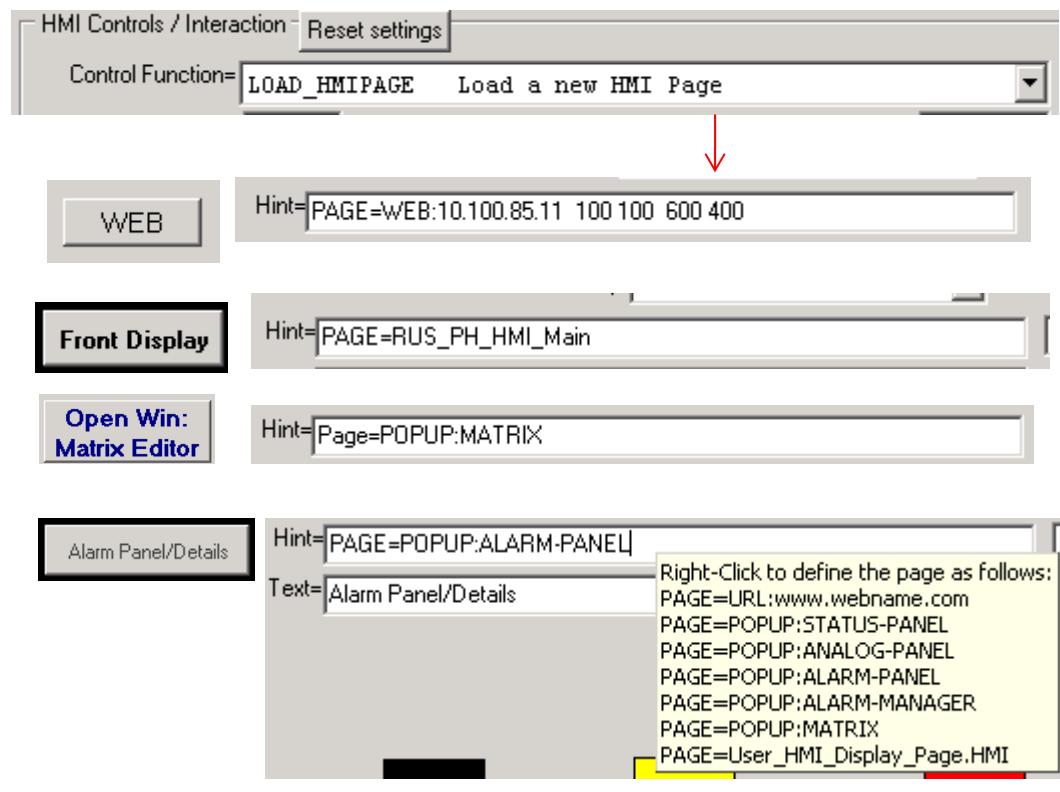
Step2:

To switch to the current selected page (display), double-click it.
To popup the current selected page (display), right-click and select the menu command (PopUp).



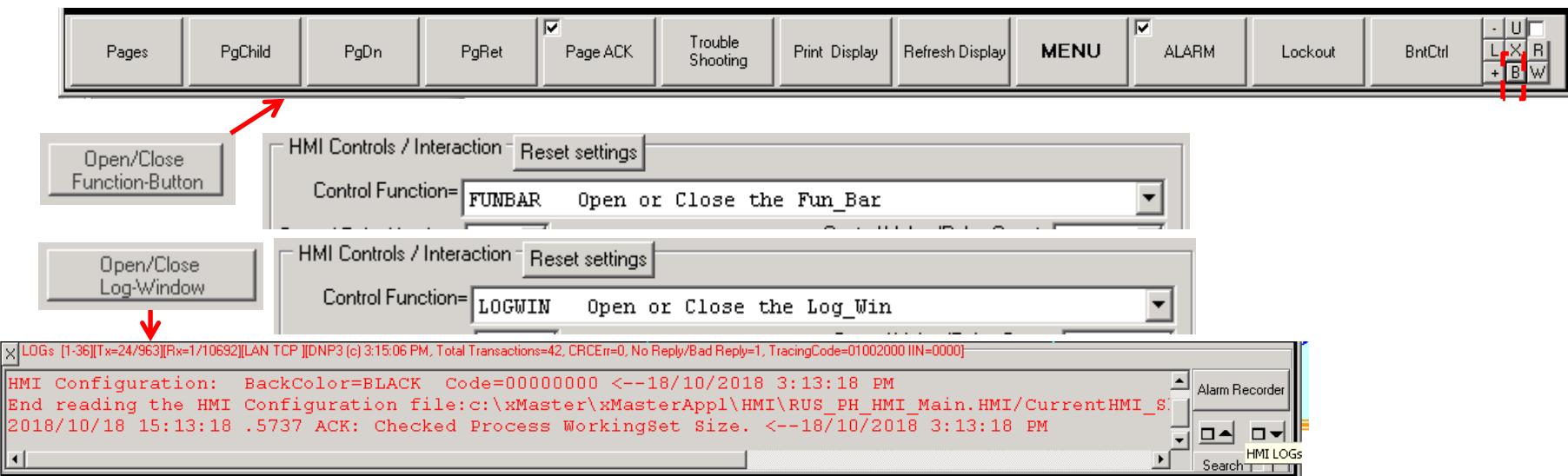
8. To Navigate HMI Display Pages

continue



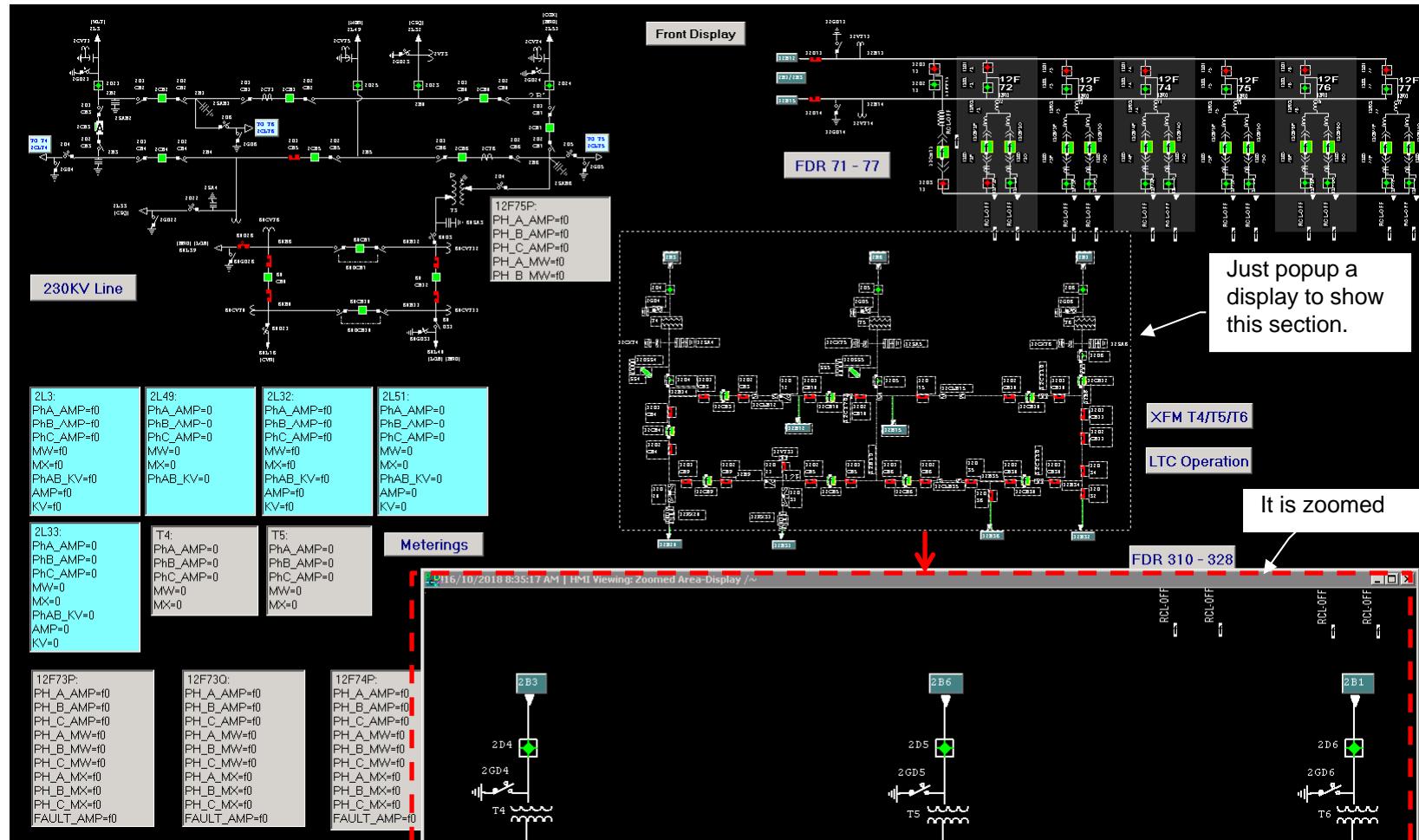
**Navigation configuration can be defined in any HMI shape object.
Display page (Popup) is defined in Hint.**

Refer to Slide Section 5.



9. To Zoom or Crop a HMI display

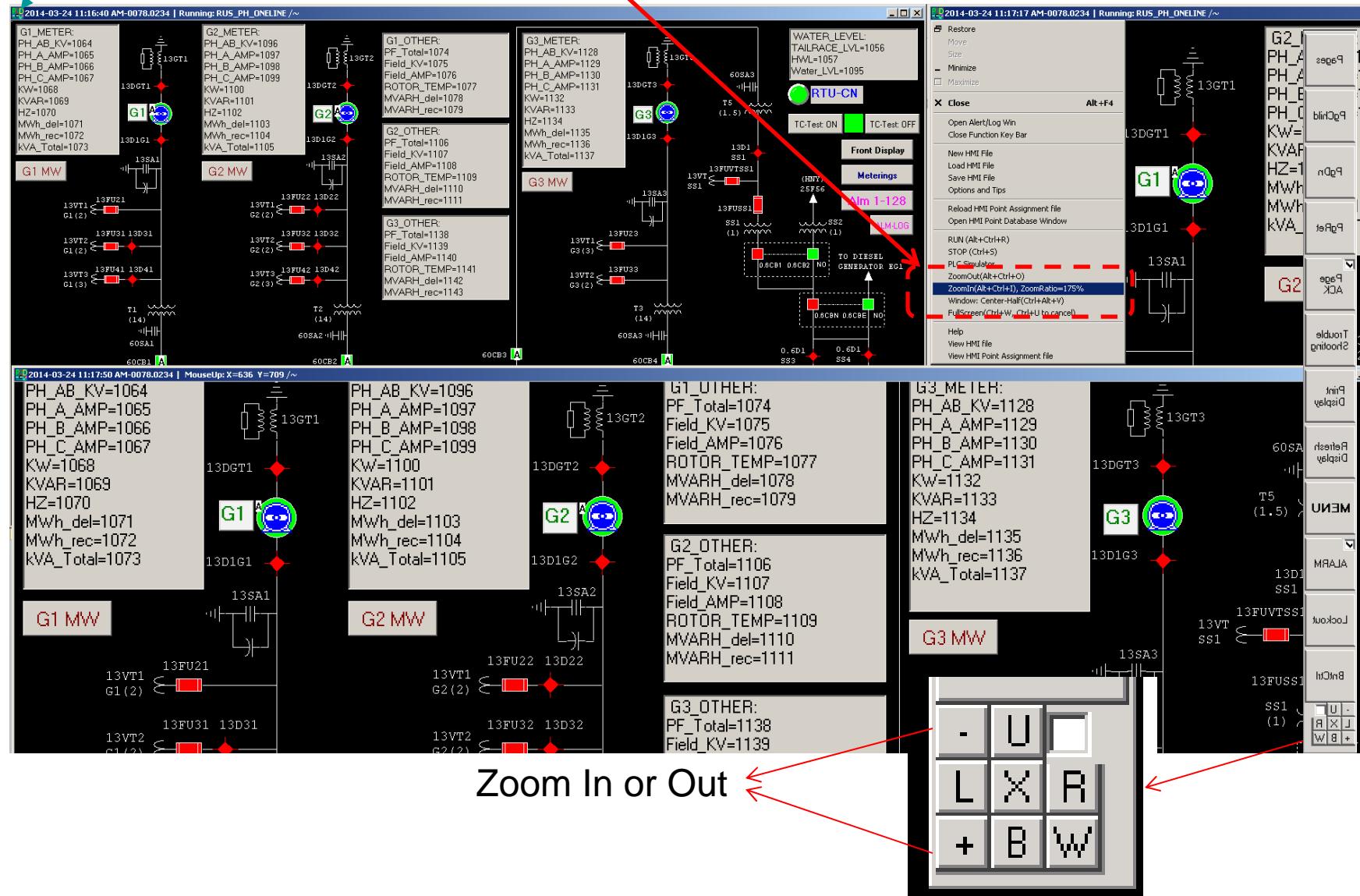
- In a system overview display, you can look into a section in detail (Zoom-in).
- Press keys of **Ctrl + Alt** and the **Left key** on the mouse and make (draw) a selected area, you can popup a cropped display.



9. To Zoom or Crop a HMI display

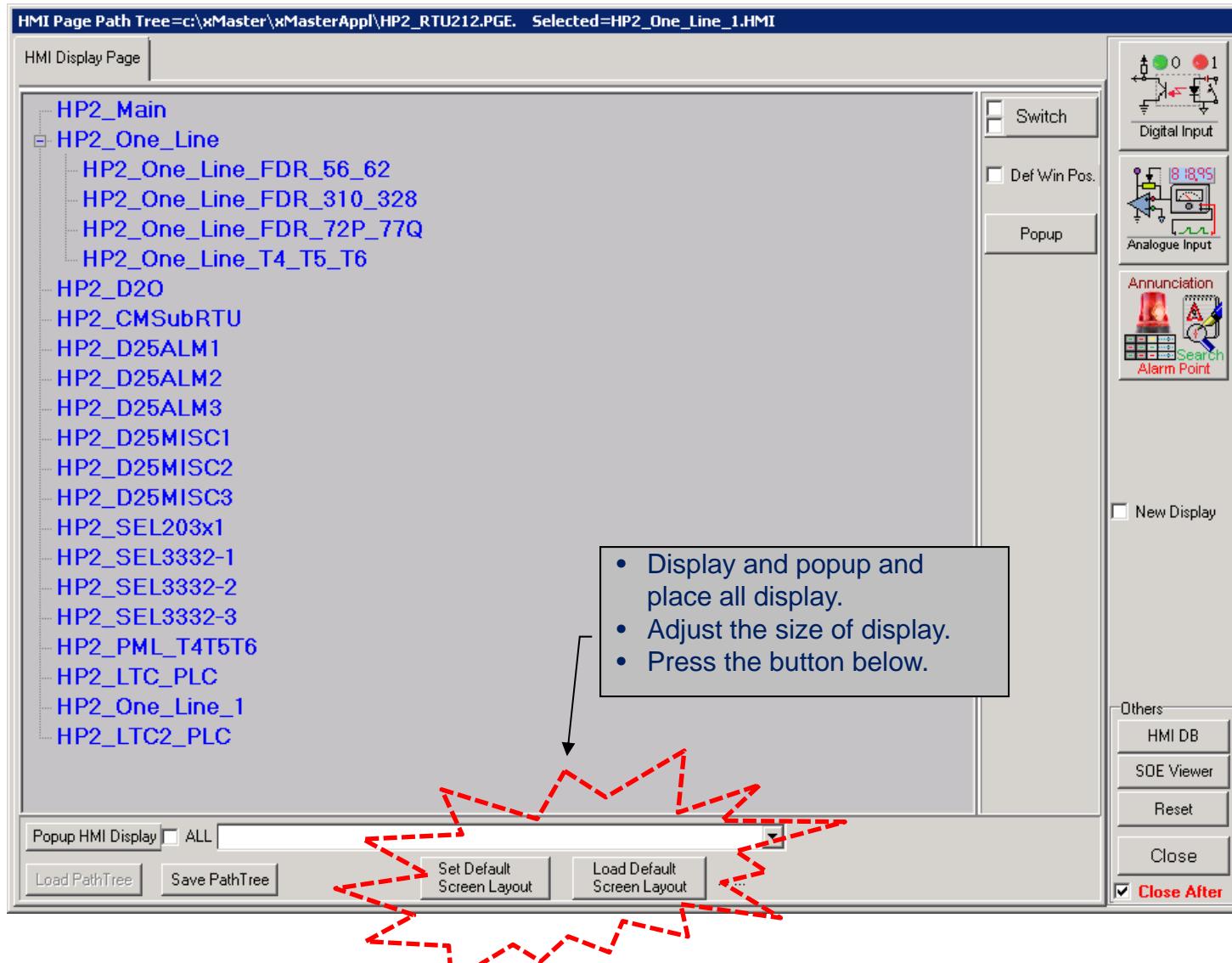
continue

Click on the icon of window menu to
Zoom In or Out.
Or short-key: Alt+Ctrl+I or Alt+Ctrl+O



10. To set up a default screen and display layout

- You may want to go to a default display arrangement /layout directly every time when you reboot /restart HMI system.



11. To Check Alarm Real-time state

- Please refer to Section 8 (To Navigate HMI Display Pages) to learn how to navigate to this display, Or how to design a button with a configuration allowing you to popup this display.

Alarm Display Panel : Show ALL

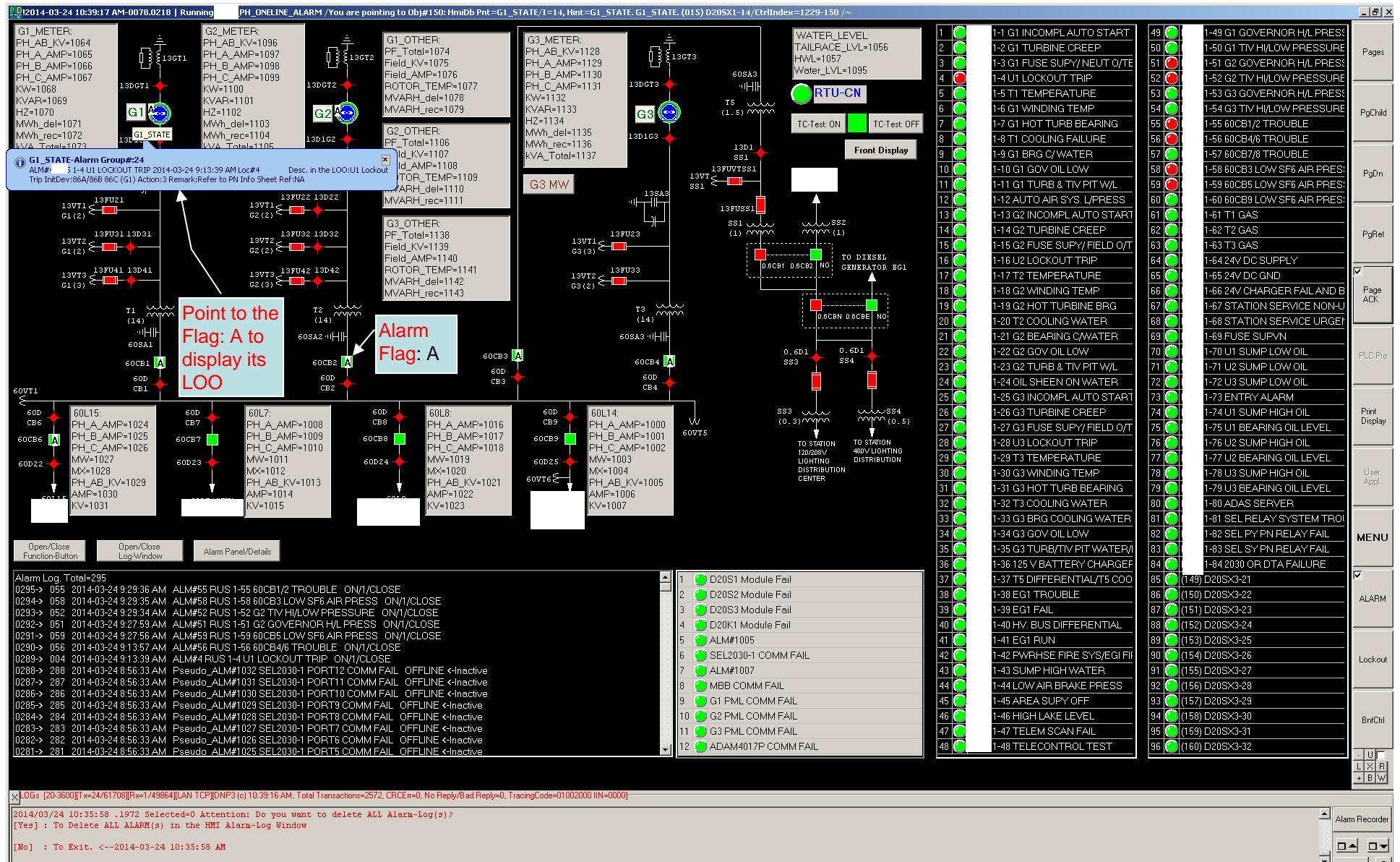
ALM#1 2L50 PUMP LO OIL LEVEL	ALM#2 ALARM 1-288 FUSE FAIL	ALM#3 12CB10 TROUBLE	ALM#4 SPARE	ALM#5 SPARE	ALM#6 12CB10 LOCKOUT	ALM#7 SPARE
ALM#8 SPARE			ALM#11 SPARE	ALM#12 T4-T5 OUT OF STEP	ALM#13 12CB30 MOTOR TRIPPED	ALM#14 12CB12 LOCKOUT
ALM#15 T3 WINDING TEMPERATURE	ALM#16 SPARE	ALM#17 SPARE	ALM#18 T3 OIL TEMPERATURE	ALM#19 SPARE	ALM#20 SPARE	ALM#21 T3 OIL LEVEL
ALM#22 SPARE	ALM#23 SPARE	ALM#24 T3 GAS ACCUMULATION	ALM#25 12CB70 TROUBLE	ALM#26 T4 WINDING TEMPERATURE	ALM#27 T5 WINDING TEMPERATURE	ALM#28 2L32 21L/MIRROR BITS FAIL
ALM#29 T4 OIL TEMPERATURE	ALM#30 T5 OIL TEMPERATURE	ALM#31 2L32 21LS / MIRROR BIT FAIL	ALM#32 T4 LOW OIL	ALM#33 T5 LOW OIL	ALM#34 SPARE	ALM#35 T4 GAS ACCUMULATION
ALM#36 T5 GAS ACCUMULATION	ALM#37 T6 WINDING TEMPERATURE	ALM#38 T6 LOW OIL	ALM#39 T6 NON-ELECTRICAL TRIP BLOCK	ALM#40 T6 OIL TEMPERATURE	ALM#41 T6 GAS ACCUMULATION	ALM#42 12CB70 LOCKOUT

Toolbars and Buttons:

- ACK (Acknowledge)
- Up/Down arrows (Sort/Filter)
- Next/Last the Whole Page
- 1st Occurrence
- TextColor (Text Color Selection)
- Show Active Alarm(s)
- Total=2
- Show ALL (Definitions)
- Integrity Poll
- Show Offline Alarms
- Total=352
- Reset All Inactive Alarms
- Show Alarm Group
- Group: 1
- Speaker icon (Volume Control)
- Text input field: ALM#1 2L50 PUMP LO OIL LEVEL Action:1

11. To Check Alarm Real-time state

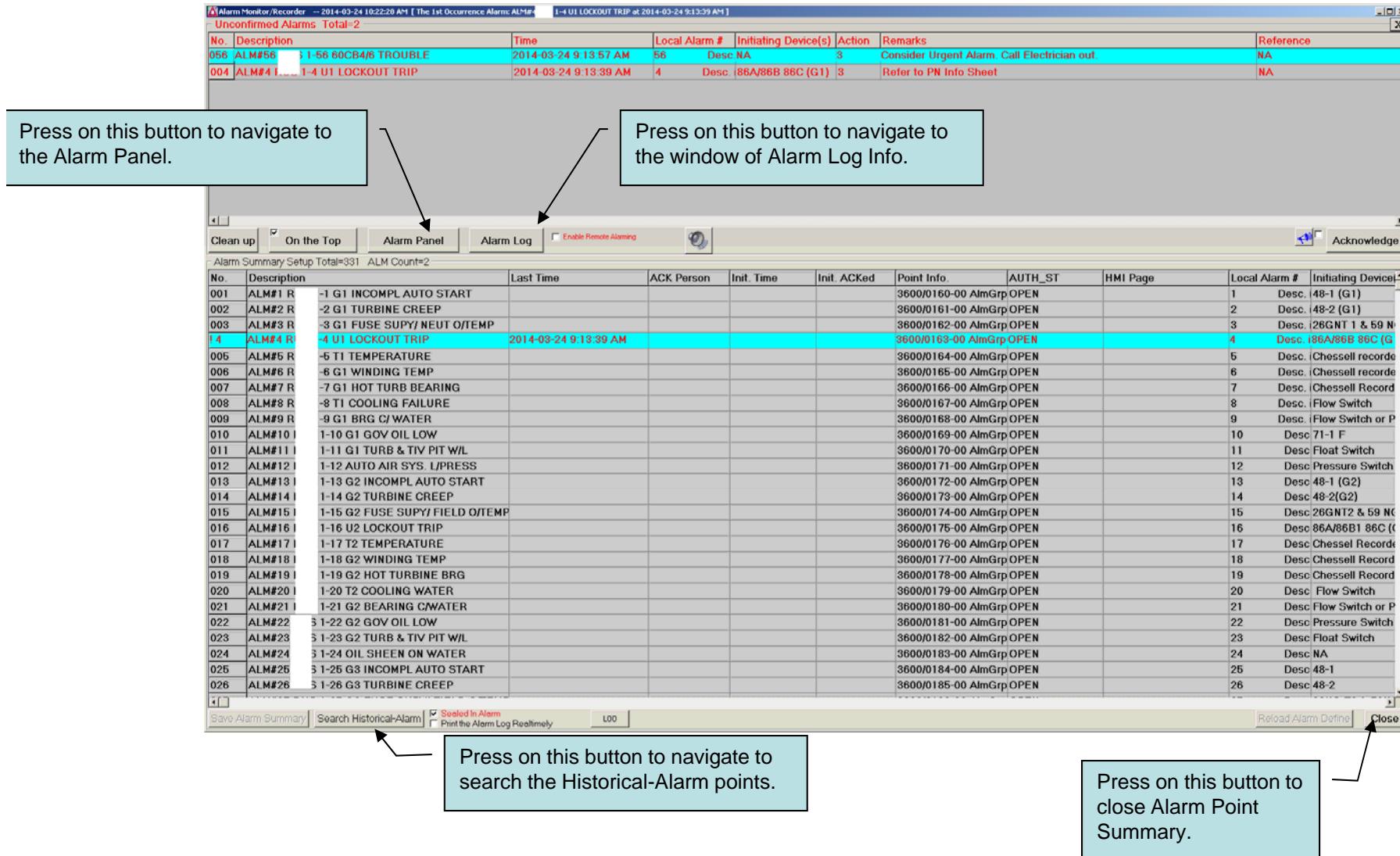
continue



12. To Check Alarm records and LOO

• Alarm Point Summary

- In a display, press the Key of [Home] to show the Function Buttons Bar up to the font. Press the button of [Alarm].
- In the display of [MENU], press the button of [Alarm Point].



12. To Check Alarm records and LOO

continue

• Alarm Panel

Refer to previous page, you can navigate to the Alarm Panel as shown below. Or you can right-click on the button of [Page] (on the Function Buttons Bar) to open a separate window for the Alarm Panel.



Select a command to handle the alarm point (that you can you selected).

Press on this button to Execute the command.

Press on this button to navigate to show all active alarm points only.

12. To Check Alarm records and LOO

continue

- Alarm Log Info

The screenshot shows the 'Alarm Monitor/Recorder' software interface. At the top, it displays 'Unconfirmed Alarms Total=12'. Below is a table of alarms with columns: No., Description, Time, Local Alarm #, Initiating Device(s), Action, Remarks, and Reference. The table lists various alarms such as 'I-10 G1 GOV OIL LOW', 'I-32 T3 COOLING WATER', and 'I-24 OIL SHEEN ON WATER'. A large callout box points to the 'Command / Functions Buttons.' located at the bottom of the window, which includes options like 'Clean up', 'On the Top', 'Alarm Panel', 'Alarm Log' (which is selected), 'Acknowledge', and several dropdown menus.

No.	Description	Time	Local Alarm #	Initiating Device(s)	Action	Remarks	Reference
005	I-11 TEMPERATURE	2014-03-24 12:28:59 PM	5	Desc iChessell recorder CS	3	60 deg C. Remove transformer from service	NA
010	I-10 G1 GOV OIL LOW	2014-03-24 12:28:58 PM	10	Desc 71-1 F	3	Loss of control DC/Oil low Governor.	NA
032	I-32 T3 COOLING WATER	2014-03-24 12:28:57 PM	32	Desc Flow Switch	3	NA	NA
028	I-28 U3 LOCKOUT TRIP	2014-03-24 12:28:56 PM	28	Desc 86A/86B1 86C (G3)	3	Refer to PN Info Sheet	NA
024	I-24 OIL SHEEN ON WATER	2014-03-24 12:28:55 PM	24	Desc NA	3	NA	NA
001	I-1 G1 INCOMPL AUTO START	2014-03-24 12:28:53 PM	1	Desc (48-1 (G1))	5	12.0min, Alarm Only	NA
057	I-57 60CB7/8 TROUBLE	2014-03-24 12:28:37 PM	57	Desc NA	3	Consider Urgent Alarm. Call Electrician out.	NA
058	I-58 60CB3 LOW SF6 AIR PRESS	2014-03-24 12:28:36 PM	58	Desc NA	3	Consider Urgent Alarm. Call Electrician out.	NA
059	I-59 60CB5 LOW SF6 AIR PRESS	2014-03-24 12:26:07 PM	59	Desc NA	3	Consider Urgent Alarm. Call Electrician out.	NA
056	I-56 60CB4/6 TROUBLE	2014-03-24 12:26:07 PM	56	Desc NA	3	Consider Urgent Alarm. Call Electrician out.	NA
055	I-55 60CR1/2 TROU1R1 F	2014-03-24 12:26:07 PM	55	Desc NA	3	Consider Urgent Alarm. Call Electrician out.	NA

Command / Functions Buttons.

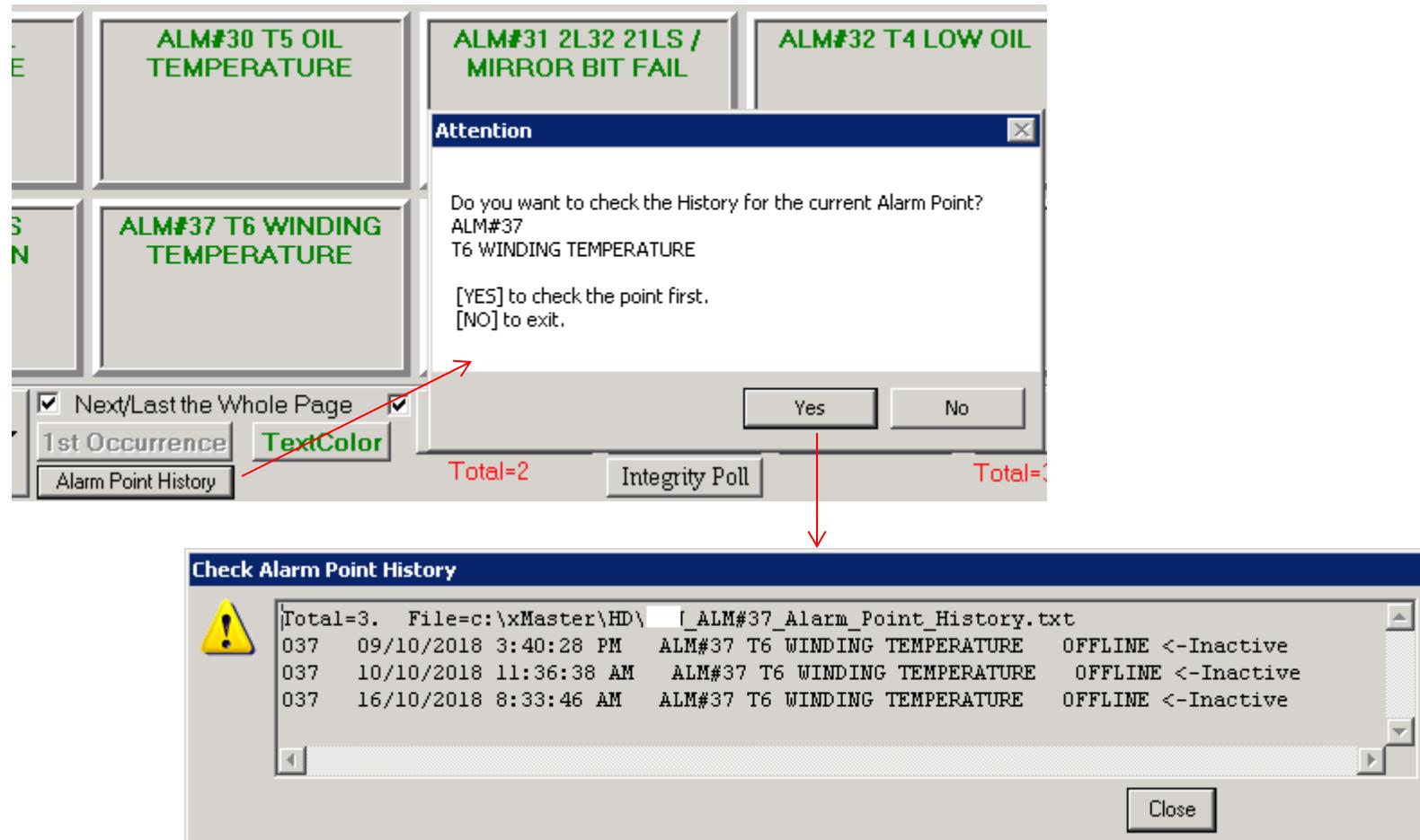
Alarm Log Total=3

Time	Local Alarm #	Description	Status
2014-03-24 12:28:59 PM	5	I-11 TEMPERATURE	ON/1/CLOSE
2014-03-24 12:28:58 PM	10	I-10 G1 GOV OIL LOW	ON/1/CLOSE
2014-03-24 12:28:57 PM	32	I-32 T3 COOLING WATER	ON/1/CLOSE
2014-03-24 12:28:56 PM	28	I-28 U3 LOCKOUT TRIP	ON/1/CLOSE
2014-03-24 12:28:55 PM	24	I-24 OIL SHEEN ON WATER	ON/1/CLOSE
2014-03-24 12:28:53 PM	1	I-1 G1 INCOMPL AUTO START	ON/1/CLOSE
2014-03-24 12:28:37 PM	57	I-57 60CB7/8 TROUBLE	ON/1/CLOSE
2014-03-24 12:28:36 PM	58	I-58 60CB3 LOW SF6 AIR PRESS	ON/1/CLOSE
2014-03-24 12:26:07 PM	59	I-59 60CB5 LOW SF6 AIR PRESS	ON/1/CLOSE
2014-03-24 12:26:07 PM	56	I-56 60CB4/6 TROUBLE	ON/1/CLOSE <-Inactive
2014-03-24 12:28:35 PM	55	I-55 60CR1/2 TROU1R1 F	ON/1/CLOSE

Select the starting line and click on above button to ACK or Delete the Alarm Log Info.

13. To Search Alarm historical data

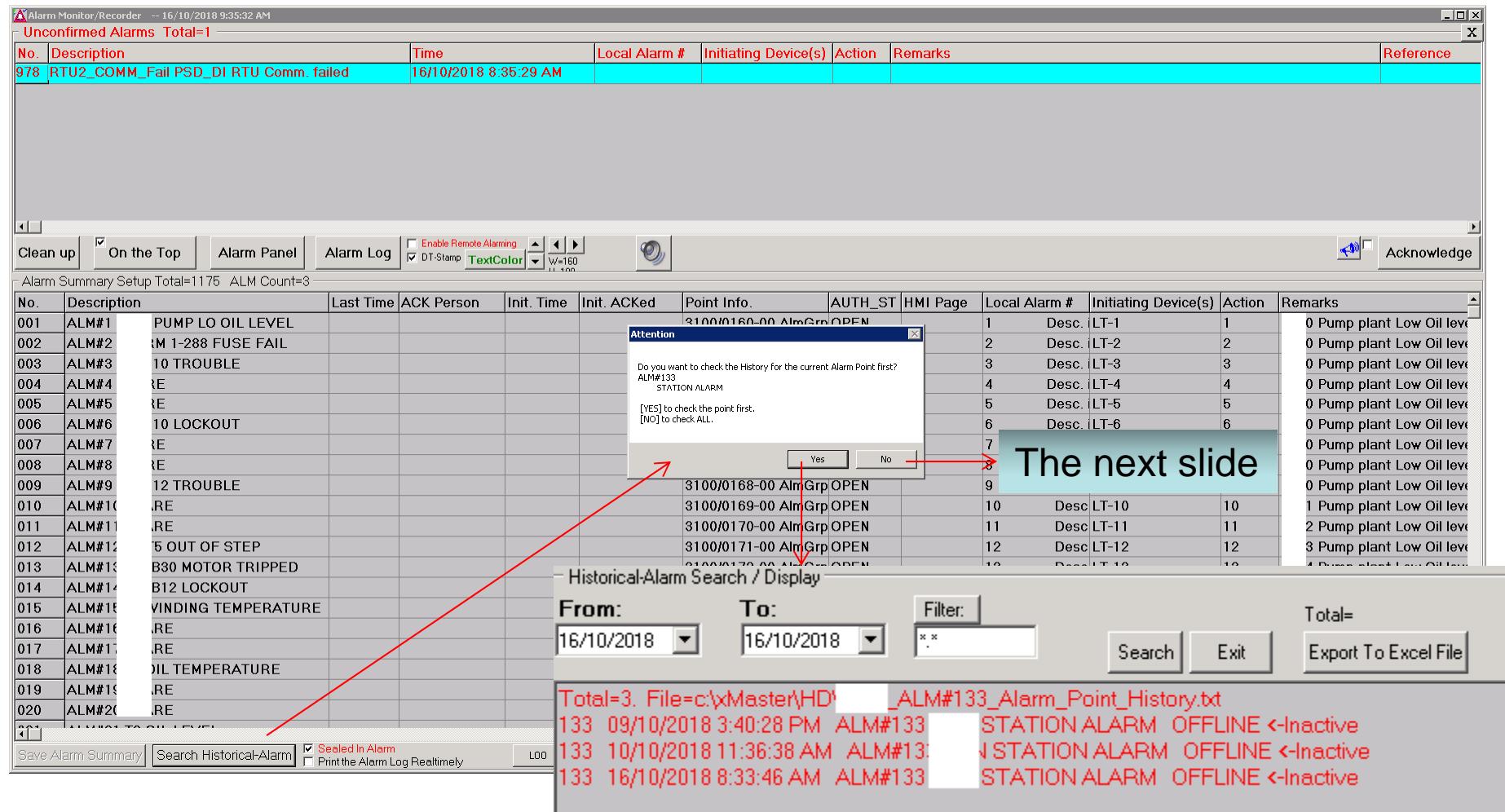
Check Alarm Point History from the display of Alarm Real-time state (refer to section 11).



13. To Search Alarm historical data

continue

Check Alarm Point History from the display of Alarm Record (refer to section 12).



13. To Search Alarm historical data

continue

Check Alarm Point History from the display of Alarm Record (refer to the previous slide).

The screenshot shows the 'Alarm Monitor/Recorder' application window. At the top, it displays 'Unconfirmed Alarms Total=1'. Below this is a table with columns: No., Description, Time, Local Alarm #, Initiating Device(s), Action, and Remarks. One row is visible: '978 RTU2_COMM_Fail PSD_DI RTU Comm. failed' at '16/10/2018 8:35:29 AM'. The bottom half of the window is a large text area titled 'Historical-Alarm Search / Display' with a search bar containing 'Searching...000@3368/14233'. Below the search bar are buttons for 'From', 'To', 'Filter', 'Abort', 'Exit', and 'Export To Excel File'. The main text area lists numerous historical alarms, each with a timestamp and a detailed description. A red arrow points to the search bar with the text 'It may take some time to finish'.

No.	Description	Time	Local Alarm #	Initiating Device(s)	Action	Remarks
978	RTU2_COMM_Fail PSD_DI RTU Comm. failed	16/10/2018 8:35:29 AM				

Historical-Alarm Search / Display

From: 16/10/2018 To: 16/10/2018 Filter: *.* Searching...000@3368/14233

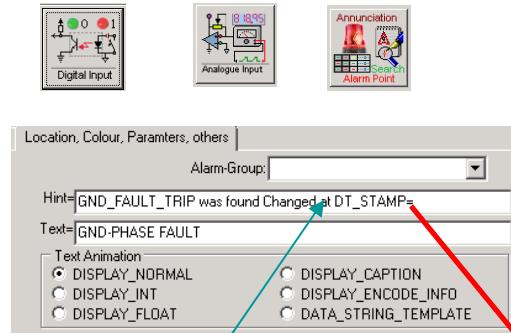
Abort Exit Export To Excel File

of Historical-Alarm: 2000 01/10/2018 11:31:01 AM ALM#2000 D20SX1 Fail OFFLINE <Inactive
of Historical-Alarm: 2001 01/10/2018 11:31:01 AM ALM#2001 D20KX1 Fail OFFLINE <Inactive
of Historical-Alarm: 2002 01/10/2018 11:31:01 AM ALM#2002 (192) SIP COMM-FAIL OFFLINE <Inactive
of Historical-Alarm: 2009 01/10/2018 11:31:01 AM ALM#2009 SIP2 PLC COMM FAIL OFFLINE <Inactive
of Historical-Alarm: 2010 01/10/2018 11:31:01 AM ALM#2010 SIP2 PLC WATCHDOG to RTU Fail OFFLINE <Inactive
of Historical-Alarm: 2012 01/10/2018 11:31:01 AM ALM#2012 (1891) Calc DTA DI32 OFFLINE <Inactive
of Historical-Alarm: 2013 01/10/2018 11:31:01 AM ALM#2013 (1891) Calc DTA DI32 OFFLINE <Inactive
of Historical-Alarm: 2014 01/10/2018 11:31:01 AM ALM#2014 (1891) Calc DTA DI32 OFFLINE <Inactive
of Historical-Alarm: 2015 01/10/2018 11:31:01 AM ALM#2015 (1891) Calc DTA DI32 OFFLINE <Inactive
of Historical-Alarm: 2016 01/10/2018 11:31:01 AM ALM#2016 (1891) Calc DTA DI32 OFFLINE <Inactive
of Historical-Alarm: 2017 01/10/2018 11:31:01 AM ALM#2017 (1891) Calc DTA DI32 OFFLINE <Inactive
of Historical-Alarm: 2018 01/10/2018 11:31:01 AM ALM#2018 (1891) Calc DTA DI32 OFFLINE <Inactive
of Historical-Alarm: 2019 01/10/2018 11:31:01 AM ALM#2019 (1891) Calc DTA DI32 OFFLINE <Inactive
of Historical-Alarm: 2020 01/10/2018 11:31:01 AM ALM#2020 (1891) Calc DTA DI32 OFFLINE <Inactive
of Historical-Alarm: 2021 01/10/2018 11:31:01 AM ALM#2021 (1891) Calc DTA DI32 OFFLINE <Inactive
of Historical-Alarm: 2022 01/10/2018 11:31:01 AM ALM#2022 (1891) Calc DTA DI32 OFFLINE <Inactive
of Historical-Alarm: 2023 01/10/2018 11:31:01 AM ALM#2023 (1891) Calc DTA DI32 OFFLINE <Inactive
of Historical-Alarm: 2024 01/10/2018 11:31:01 AM ALM#2024 (1891) Calc DTA DI32 OFFLINE <Inactive
of Historical-Alarm: 2025 01/10/2018 11:31:01 AM ALM#2025 (1891) Calc DTA DI32 OFFLINE <Inactive
of Historical-Alarm: 2026 01/10/2018 11:31:01 AM ALM#2026 (1891) Calc DTA DI32 OFFLINE <Inactive
of Historical-Alarm: 2027 01/10/2018 11:31:01 AM ALM#2027 (1891) Calc DTA DI32 OFFLINE <Inactive
of Historical-Alarm: 2028 01/10/2018 11:31:01 AM ALM#2028 (1891) Calc DTA DI32 OFFLINE <Inactive
of Historical-Alarm: 2029 01/10/2018 11:31:01 AM ALM#2029 Modbus TCP/IP DCA-1 Comm Fail OFFLINE <Inactive
of Historical-Alarm: 2030 01/10/2018 11:31:01 AM ALM#2030 Modbus TCP/IP DCA-1 Exception OFFLINE <Inactive
of Historical-Alarm: 2031 01/10/2018 11:31:01 AM ALM#2031 Modbus TCP/IP DCA-1 TOP Overload OFFLINE <Inactive
of Historical-Alarm: 2032 01/10/2018 11:31:01 AM -G6-ALM#1 (068) G6-ALM#1-4x8101.0 OFFLINE <Inactive
of Historical-Alarm: 2033 01/10/2018 11:31:01 AM -G6-ALM#2 (069) G6-ALM#2-4x8101.1 OFFLINE <Inactive
of Historical-Alarm: 2034 01/10/2018 11:31:01 AM -G6-ALM#3 (070) G6-ALM#3-4x8101.2 OFFLINE <Inactive
of Historical-Alarm: 2035 01/10/2018 11:31:01 AM -G6-ALM#4 (071) G6-ALM#4-4x8101.3 OFFLINE <Inactive
of Historical-Alarm: 2036 01/10/2018 11:31:01 AM -G6-ALM#5 (072) G6-ALM#5-4x8101.4 OFFLINE <Inactive
of Historical-Alarm: 2037 01/10/2018 11:31:01 AM -G6-ALM# (073) G6-ALM#6-4x8101.5 OFFLINE <Inactive
of Historical-Alarm: 2038 01/10/2018 11:31:01 AM -G6-ALM#7 (074) G6-ALM#7-4x8101.6 OFFLINE <Inactive
of Historical-Alarm: 2039 01/10/2018 11:31:01 AM -G6-ALM#8 (075) G6-ALM#8-4x8101.7 OFFLINE <Inactive

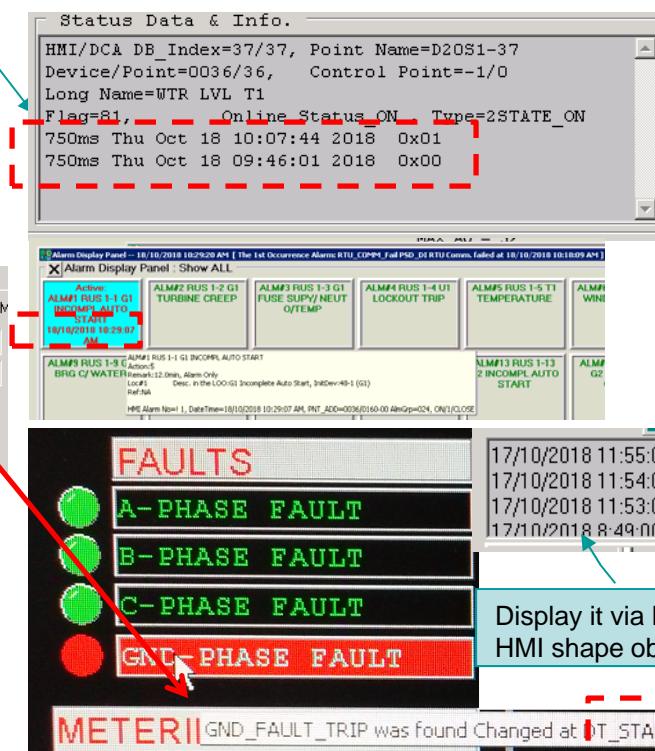
14. To Check SOE and Date & Time Stamp

How to display/check point's Date & Time Stamp (DTS)

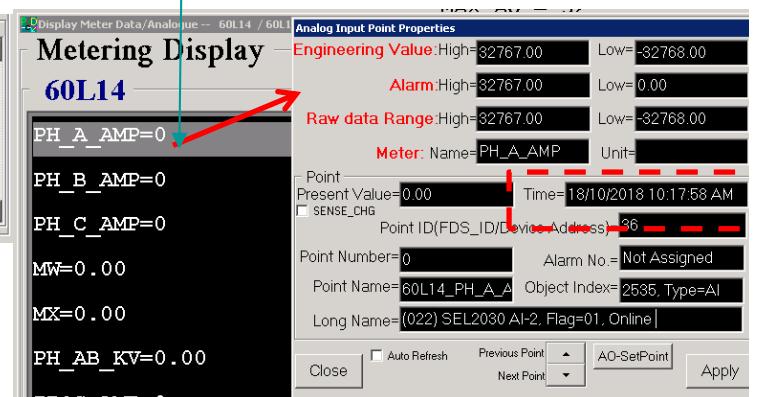
Check the DTS in Digital/Analog Input and Alarm Information Display. Refer to Section 8, 11, 12, 23, 28 and 30



"DT_STAMP=" is to show Time&Date stamp in its hint.



Double-click on it to open its properties.

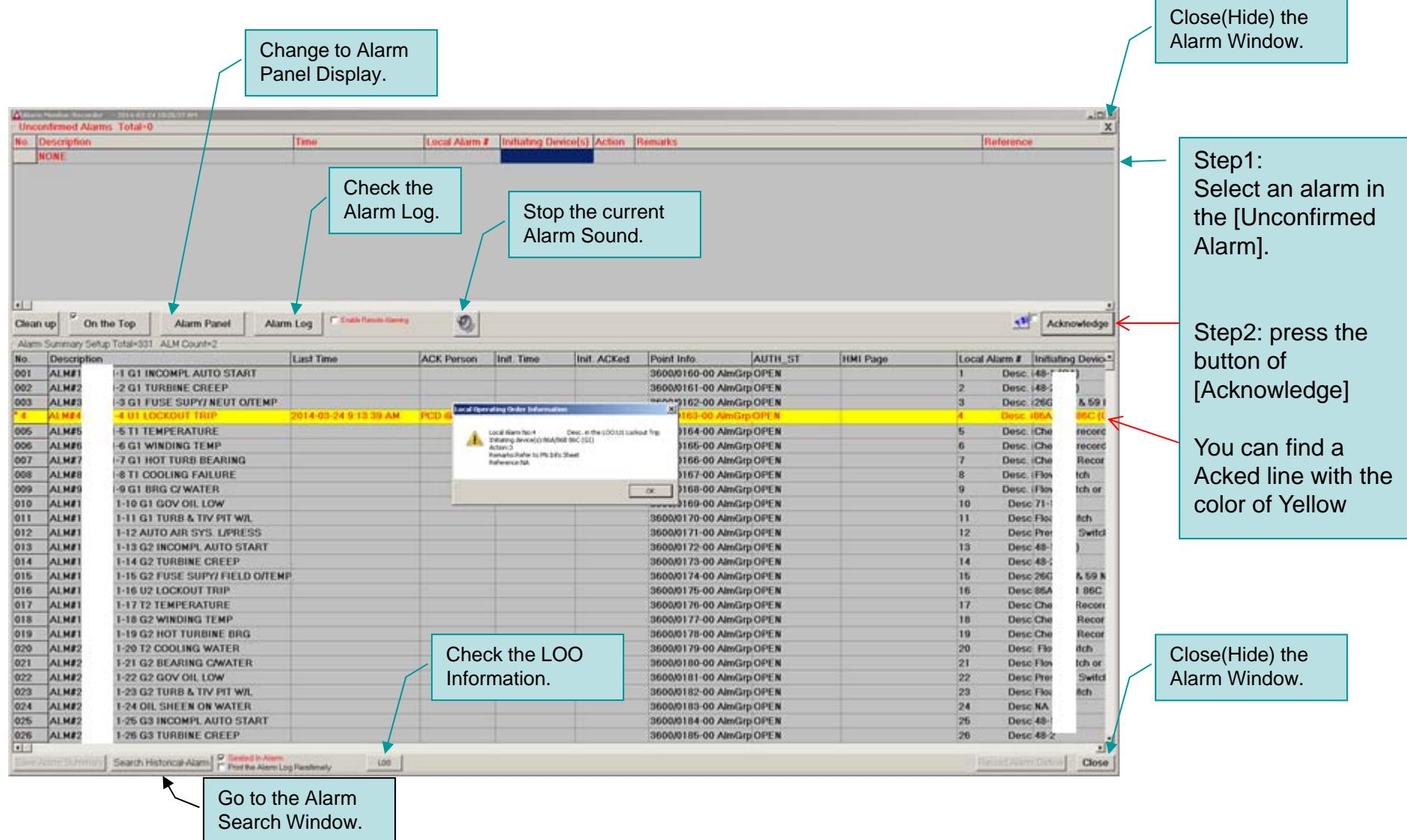


Alarm associated to Ind/Ctrl Point.

Check the DTS in DCA Point DB. Refer to Section 27

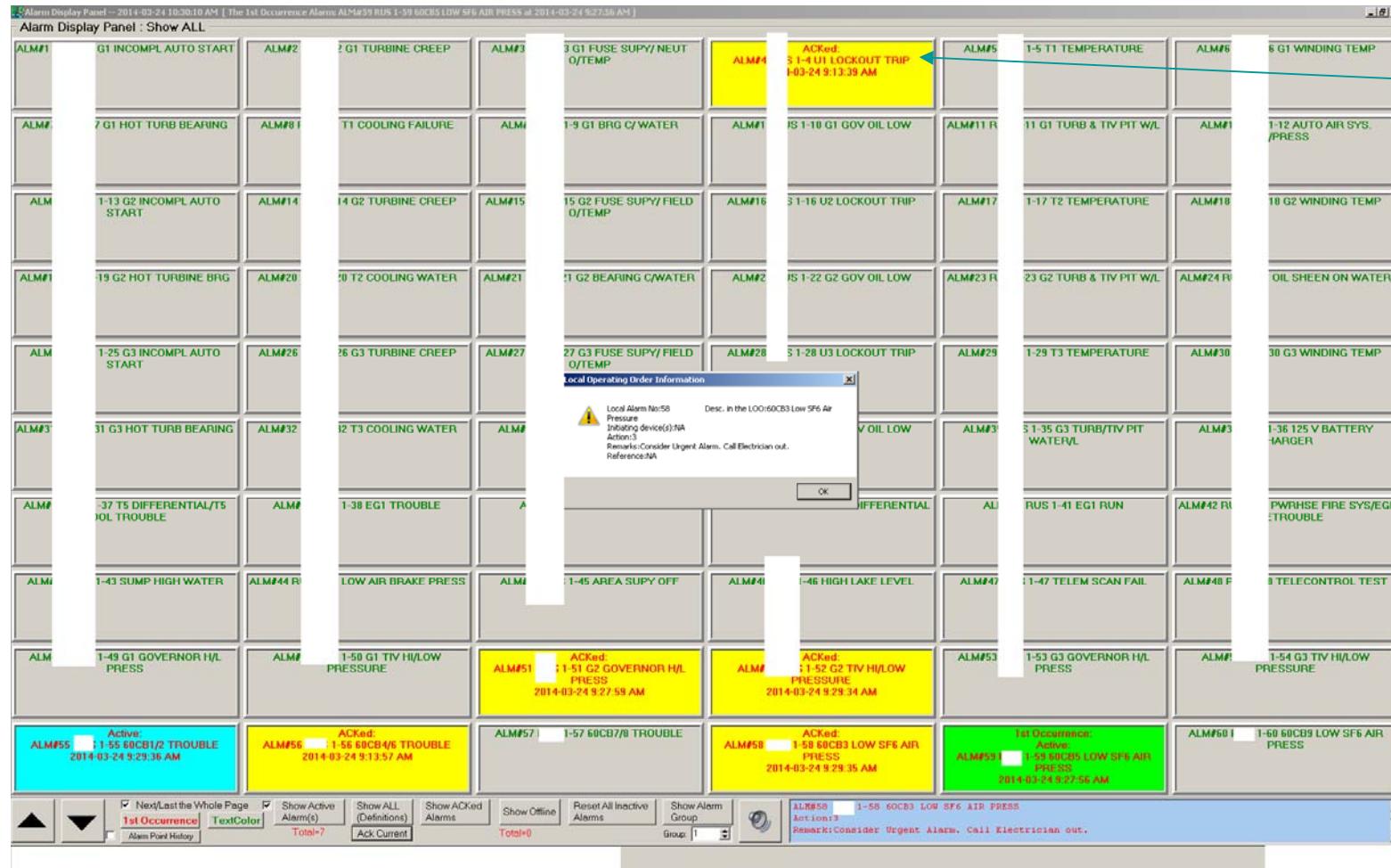
DNP Master Version 2.2018.9.28-32 -- Written by JH since 1986. Registered User:							
2018/10/18 10:03:18 .5769 Successful Login							
Point Database Administrator & Setup Configuration for data acquisition Logs							
No	Addr.	Point Name	Pri#0	Data Type#0	Dev Pnt#00000	Present Value	Last Value
*0001	00036 D36-DI1	Dev#00036 Status #0000	Pri#0	Data Type#0	Dev Pnt#00000	OFF	OFF
*0002	00036 D36-DI2	Dev#00036 Status #0001	Pri#0	Data Type#0	Dev Pnt#00001	OFF	OFF
*0003	00036 D36-DI3	Dev#00036 Status #0002	Pri#0	Data Type#0	Dev Pnt#00002	OFF	OFF
*0004	00036 D36-DI4	Dev#00036 Status #0003	Pri#0	Data Type#0	Dev Pnt#00003	OFF	OFF
*0005	00036 D36-DI5	Dev#00036 Status #0004	Pri#0	Data Type#0	Dev Pnt#00004	OFF	OFF

15. To Acknowledge Alarm.



15. To Acknowledge Alarm

continue



Step1:
Select an alarm in the [Unconfirmed Alarm].

Step2: Right-Click on a selected alarm point to popup a sub menu and select ACK. You can find an ACKed point with the color of Yellow

16. To Disable/Enable Alarm

Right-click on the current alarm in Alarm-Summary to En/Disable it (refer to section 12).

Alarm Monitor/Recorder -- 16/10/2018 10:51:51 AM [The 1st Occurrence Alarm: ALM#801 LTC1_PLC_CPU_Bat_Lo at 16/10/2018 8:51:27 AM]

Unconfirmed Alarms Total=18

No.	Description	Time	Local Alarm #	Initiating Device(s)	Action	Re
817	ALM#817 LTC1_T4_Invalid_Tap	16/10/2018 8:52:36 AM				
816	ALM#816 ALM#816	16/10/2018 8:52:31 AM				
815	ALM#815 ALM#815	16/10/2018 8:52:27 AM				
814	ALM#814 ALM#814	16/10/2018 8:52:23 AM				
813	ALM#813 ALM#813	16/10/2018 8:52:19 AM				
812	ALM#812 ALM#812	16/10/2018 8:52:14 AM				
811	ALM#811 ALM#811	16/10/2018 8:52:10 AM				
810	AI M#810 AI M#810	16/10/2018 8:52:06 AM				

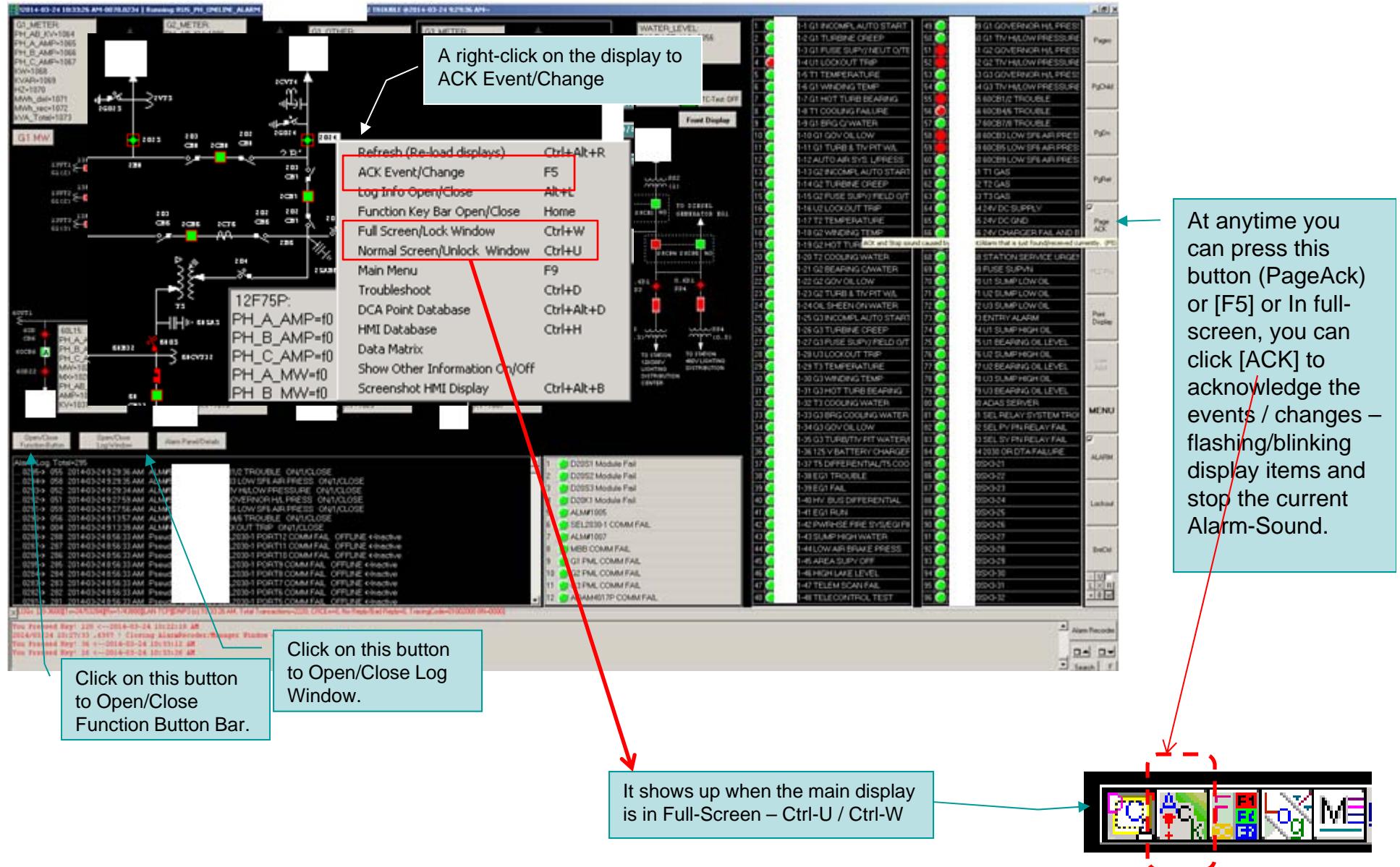
Clean up On the Top Alarm Panel Alarm Log Enable Remote Alarming DT-Stamp TextColor W=160 H=100 

Alarm Summary Setup Total=1175 ALM Count=20

No.	Description	Last Time	ACK Person	Init. Time	Init. ACKed	Point Info.	AUTH ST
001	ALM#1 2L50 PUMP LO OIL LEVEL					3100/0160-00 AlmGrp	Disabled
002	ALM#2 ALARM 1-288 FUSE FAIL					3100/0161-00 AlmGrp	OPEN
003	ALM#3 12CB10 TROUBLE					3100/0162-00 AlmGrp	OPEN
004	ALM#4 SPARE					3100/0163-00 AlmGrp	OPEN
005	ALM#5 SPARE					3100/0164-00 AlmGrp	OPEN
006	ALM#6 12CB10 LOCKOUT					3100/0165-00 AlmGrp	OPEN
007	ALM#7 SPARE					3100/0166-00 AlmGrp	OPEN
008	ALM#8 SPARE					3100/0167-00 AlmGrp	OPEN
009	ALM#9 12CB12 TROUBLE					3100/0168-00 AlmGrp	OPEN
010	ALM#10 SPARE					3100/0169-00 AlmGrp	OPEN
011	ALM#11 SPARE					3100/0170-00 AlmGrp	OPEN
012	ALM#12 T4-T5 OUT OF STEP					3100/0171-00 AlmGrp	OPEN

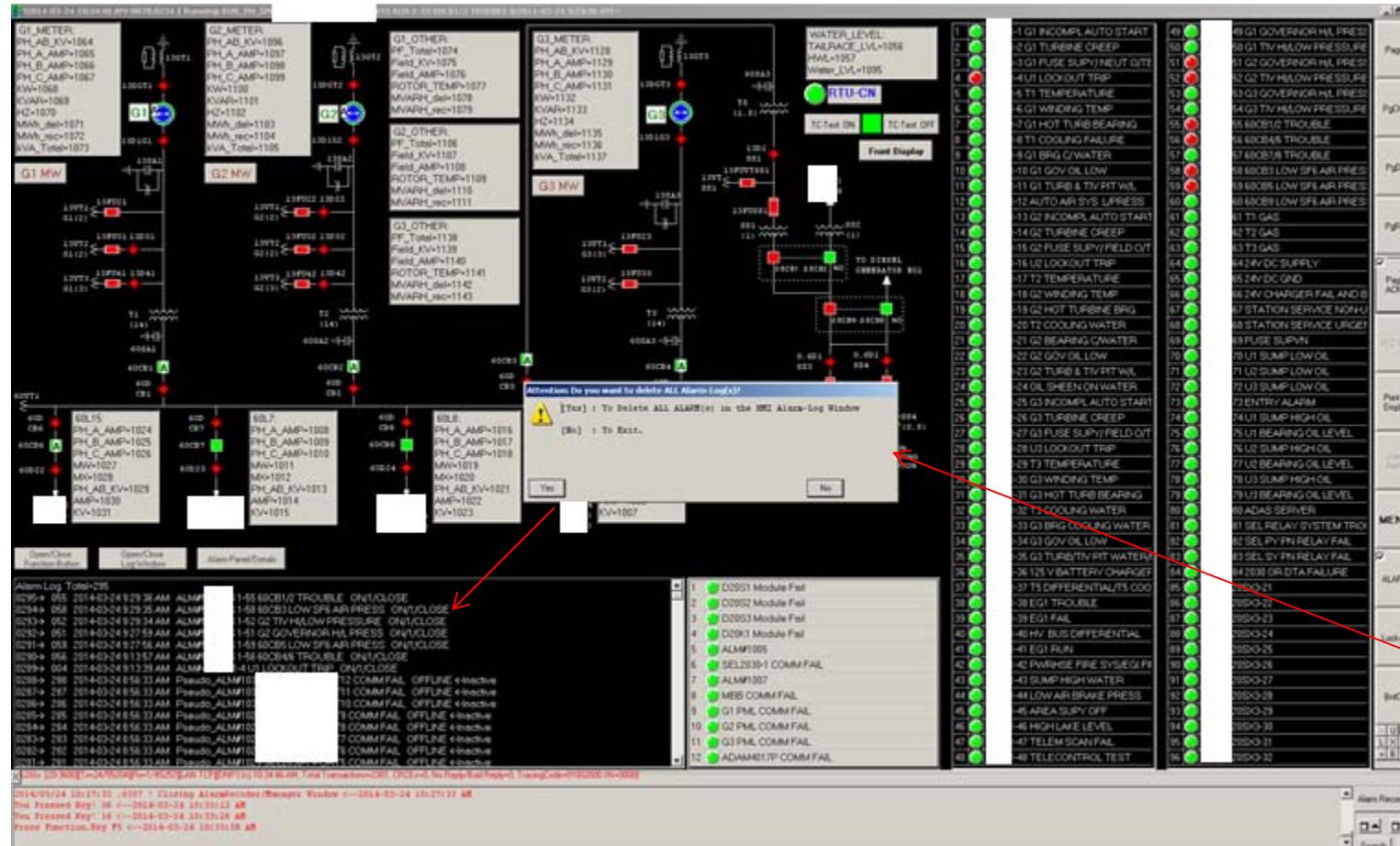
Ack the current selected
Ack ALL in the Alarm Summary
Disable or Enable the Alarm
Manually set the current alarm up.

17. To Acknowledge Event.



17. To Acknowledge Event

continue



At anytime you can press this button (PageAck) or [F5] to acknowledge the events / changes – flashing/blinking display items and stop the current Alarm-Sound.

It also asks you whether to clean up the alarm information if there is a HMI shape object: Memo that is configured as a Alarm-Log.

18. To Execute controls

- Control Operation Panel

(Digital & Analog output) Refer to Section 4.1, 5.2 and 7.2.5.

Status Display

Double-Click on it to open this window if DO or AO point is configured.

Control Test

Control: DO Pulse
Point Number: D011.00000 D11-D01
Code=1 Count= 1
ON_Timing= 750 OFF_Timing= 750

Right-Click, you can periodically and continuously execute the current control command (i.e DO Pulse)

Go for the Last or Next point

Tag Info. Operating Periodically

Design controls in a HMI display.

ENTRY

NAME	= DI_0001
LONGNAME	= Digital Input #1;
FORMAT	= DI
PROCTYPE	= ONOFF
STATCONV	= NO
PNT_ADDR	= 0
CTRL_ADDR	= 0
PNT_DEV	= 11
ALARM_GROUP	= 1

Double-Click to select a control point from a list.

Close/Open Switch

(T=172) Control: Trip Close
Point Number: D11-D02

In HMI display, click on a switch to open a control panel.

Manually send a control command of FREEZE COUNTER.

Control Test

Control: PA FREEZE
Point Number: 00 Addr=00011/0x000B

Direct Control Operation

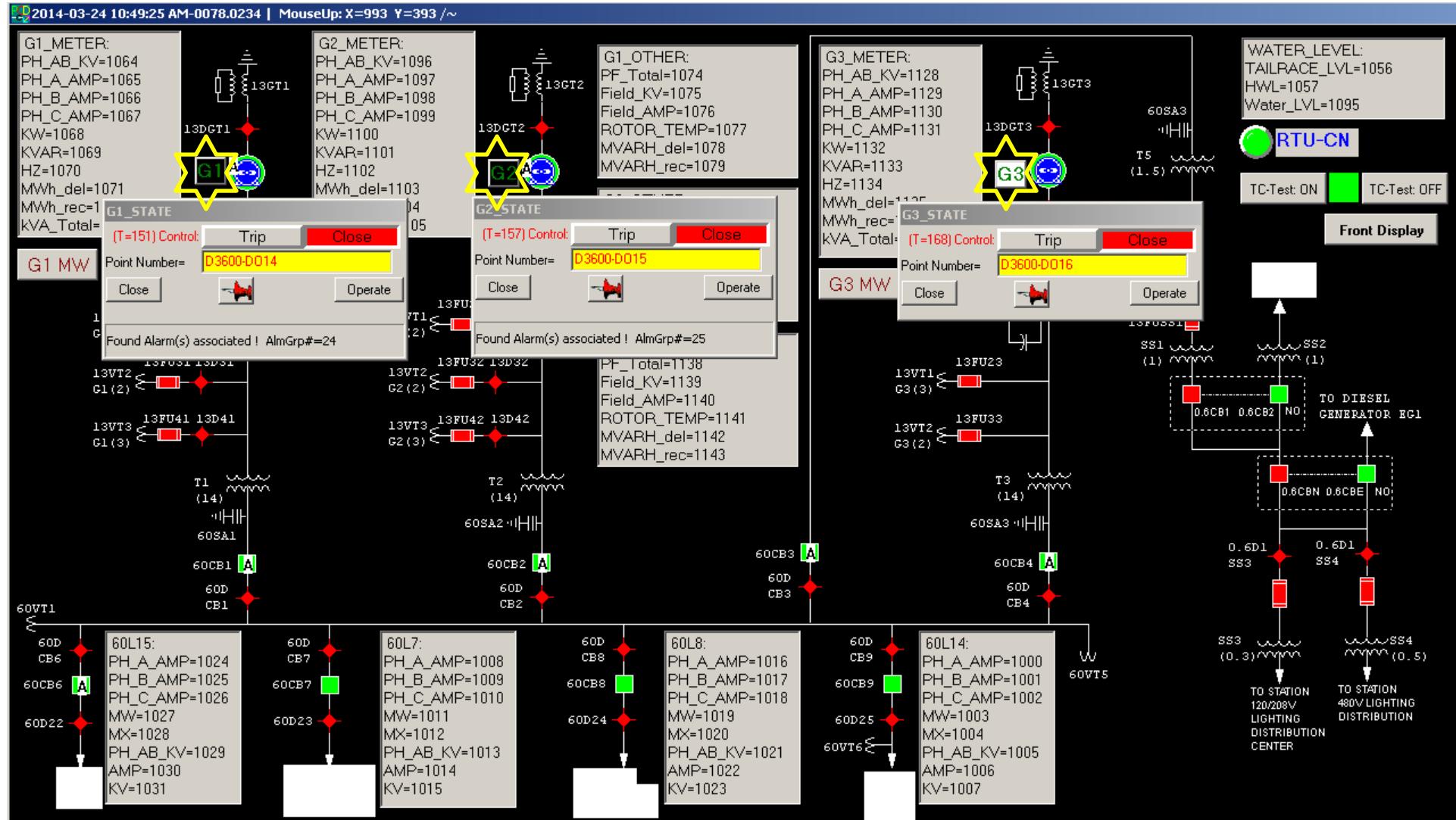
DO#02 (MB 0x002)/DI#02 (MB 1x002)
LTC Voltage Setpoint= 0.00
Select following controls:
Trip, Close, Execute, Cancel

MYPLC_9x0100= 0
Download MYPLC_9x0100 To PLC11/22 4x0100
MYPLC_9x0101= 0
Write MYPLC_9x0100 to MYPLC_9x0101

9x0100(binary)= 0000,0000,0000,0000
9x0100(32-Bit Hex)= 00000000

18. To Execute controls

continue

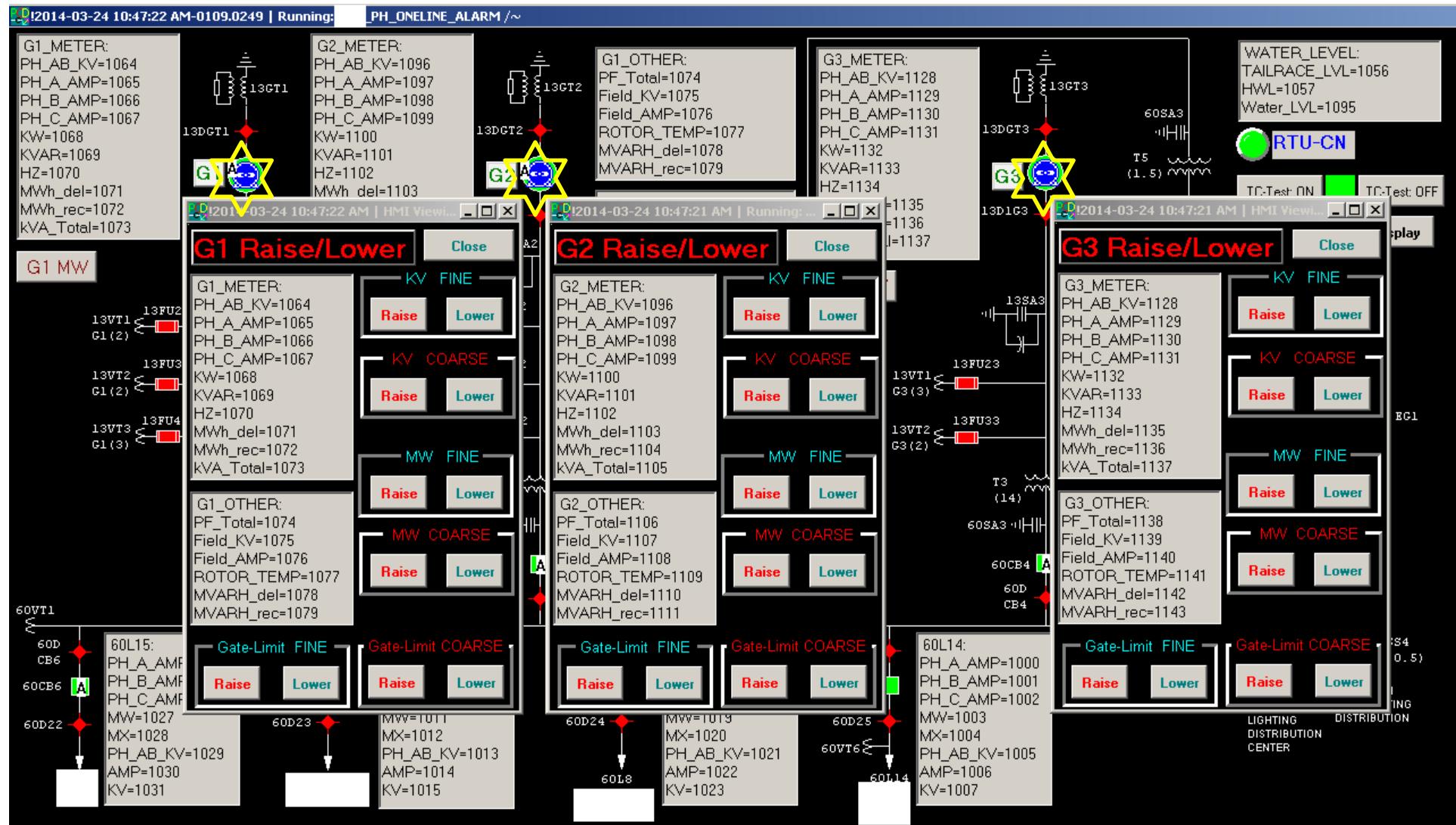


Note: To open the control operation panel, Press the button of [G1], [G2], and [G3]. If an alarm found is associated the current control point, a note will be shown at the bottom of the control panel .

highlighted makeup by 56

18. To Execute controls

continue

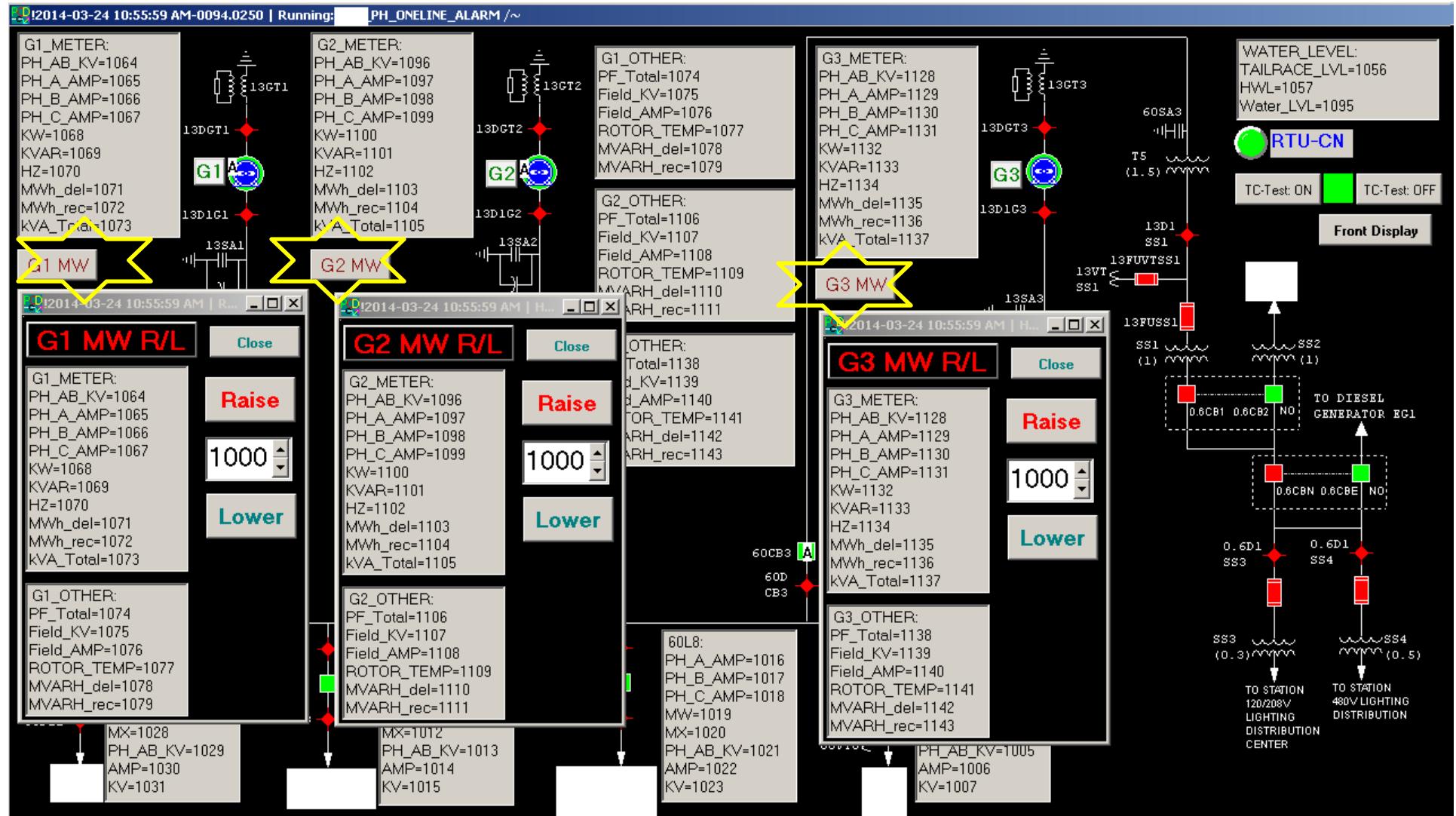


Note: To popup a window of operating Raise/Lower, Press the icon of Generator of [G1], [G2], and [G3].

highlighted makeup by

18. To Execute controls

continue

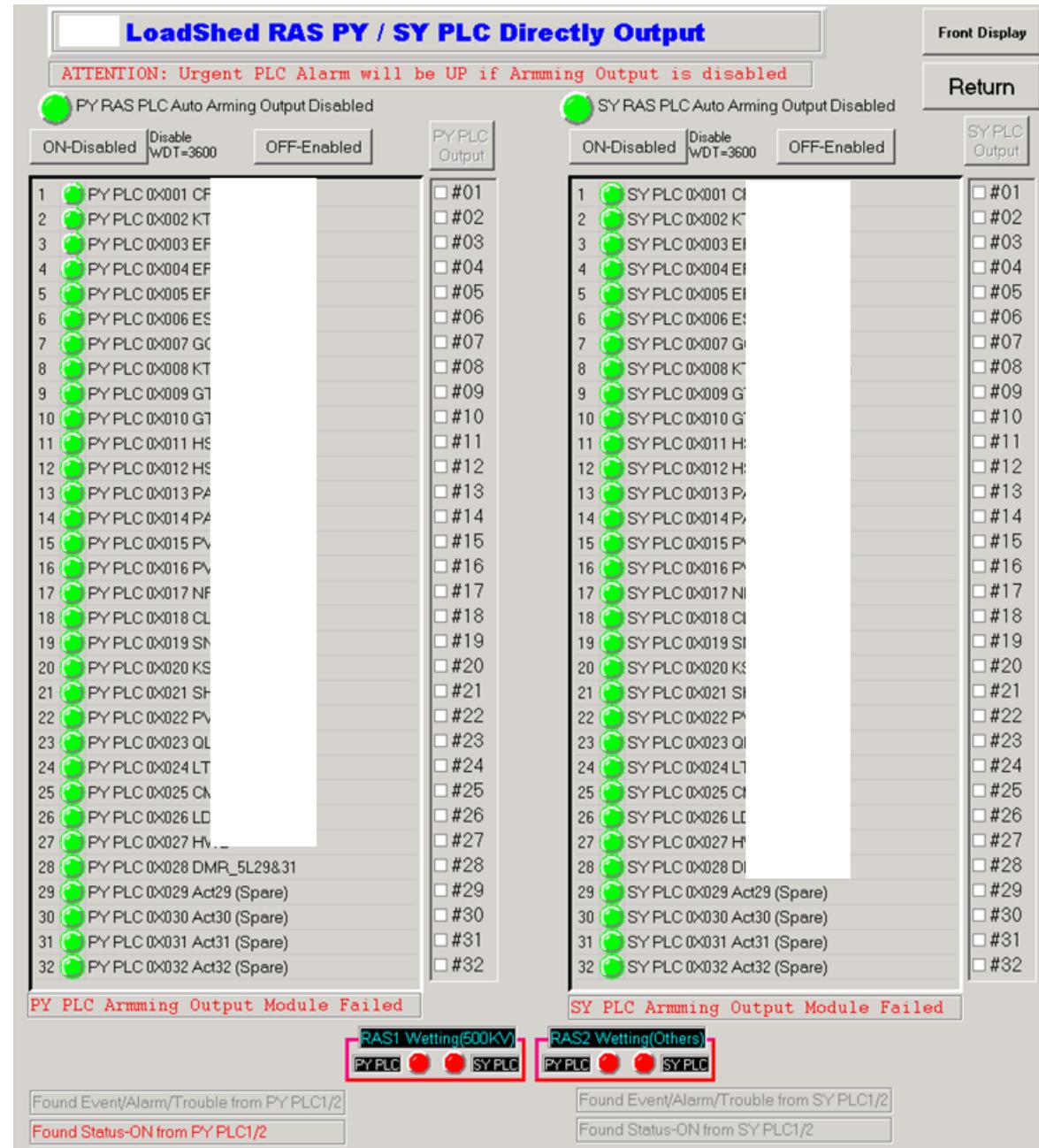


Note: To popup a window of operating Raise/Lower with variable length of Pulse output – MW only, Press the icon of Generator of [G1 MW], [G2 MW], and [G3 MW].

highlighted makeup by

18. To Execute controls

continue



18. To Execute controls

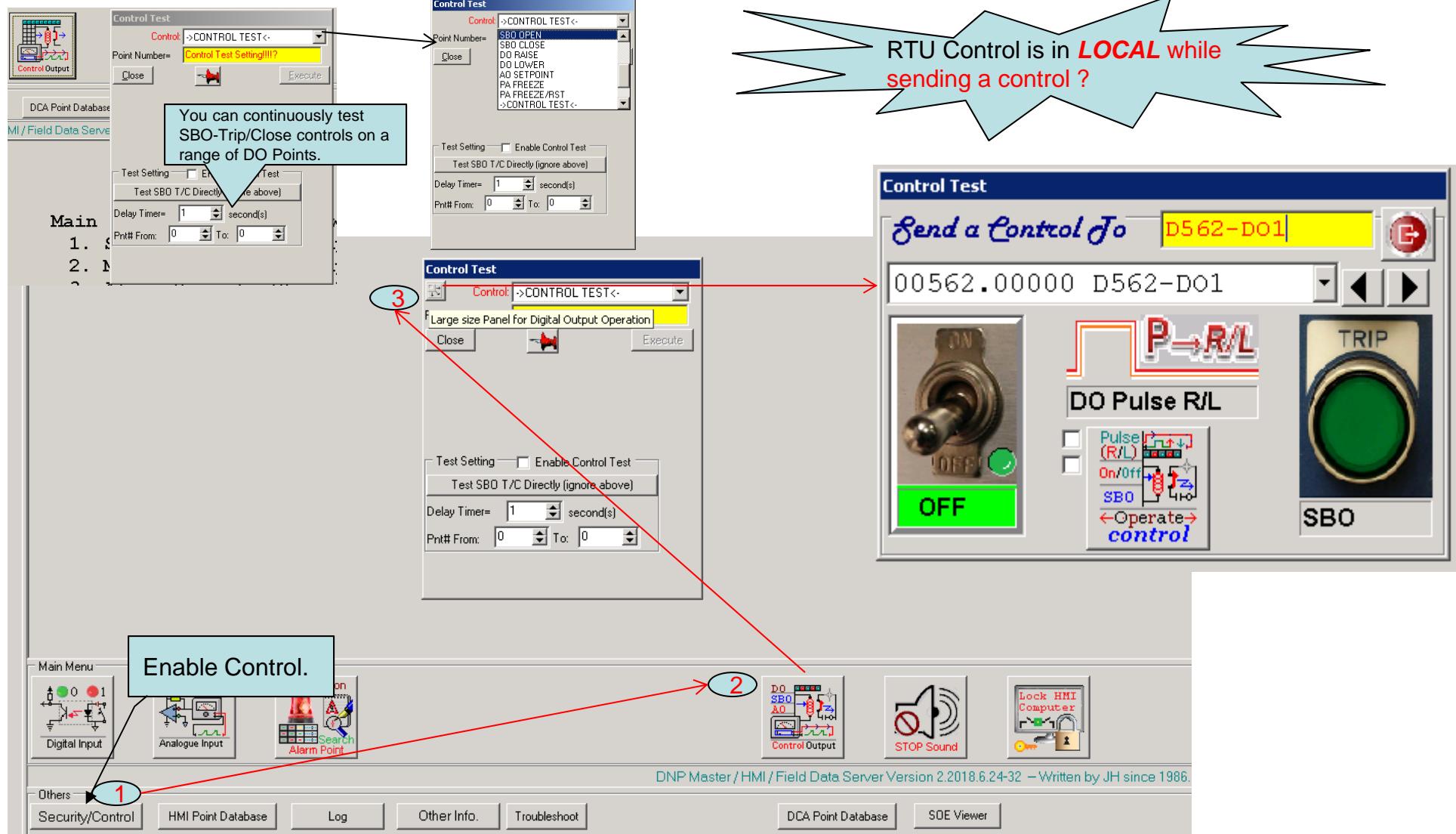
continue

Setup Timer Preset Value – Popup window

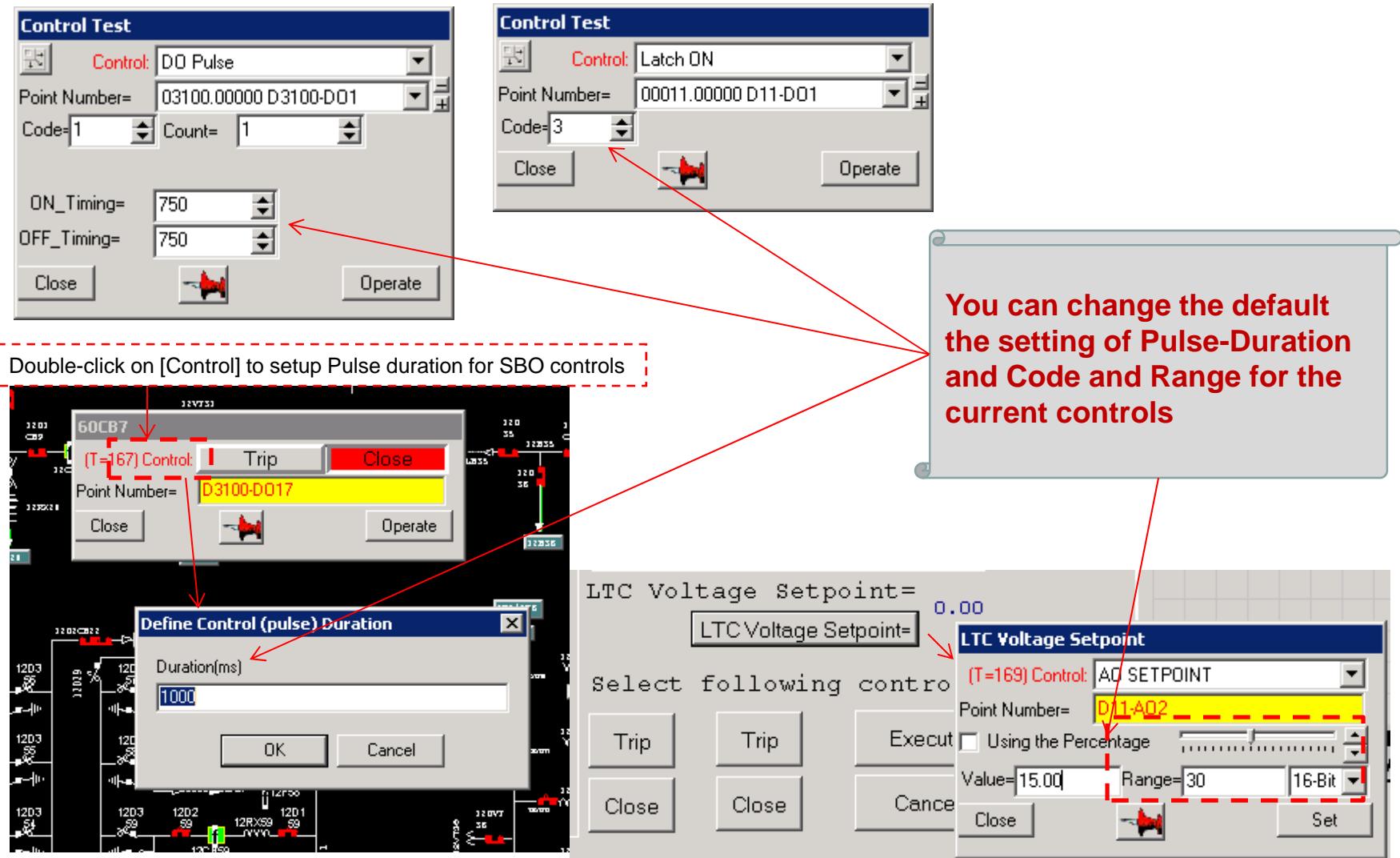


19. To Do a Control Test

- CONTROL TEST ←

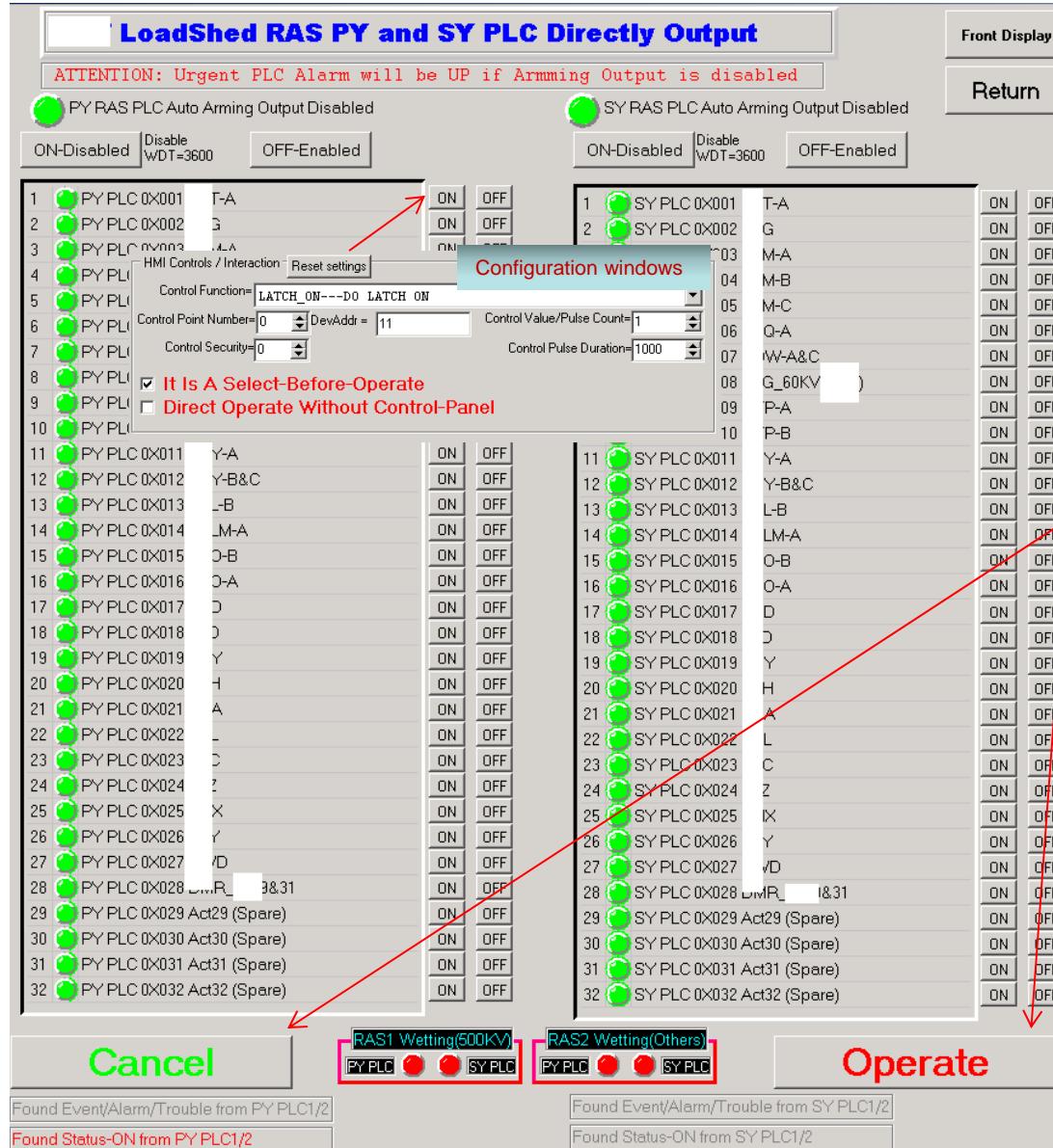


20. To Change Control Parameters



21. To Implement Group Select Before Operation

Local RAS Trip via PLC Output directly - ON/OFF SBO



Step1: Select which one is ON or OFF (if the current Relay is ON).

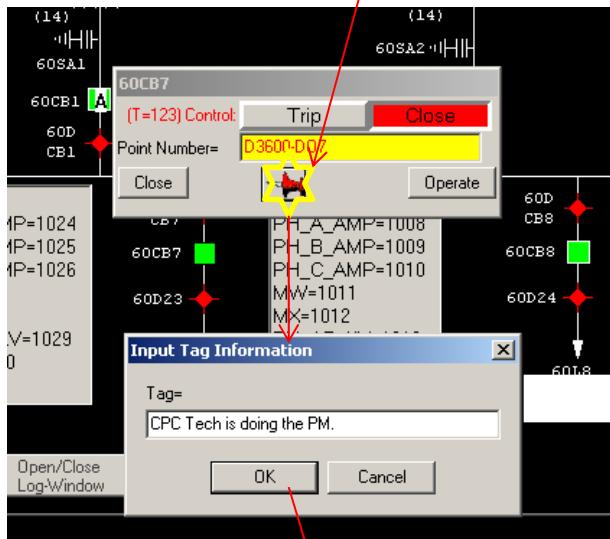
Step2: Either press the button of [Operate] to operate what you select, or press the button of [Cancel] to cancel what you select.

It is a kind of SBO (Select-Before-Operation)

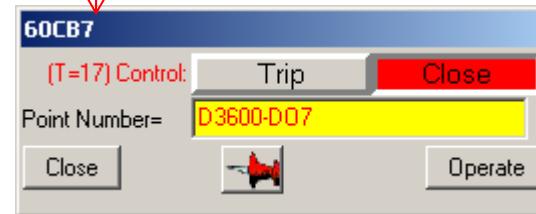
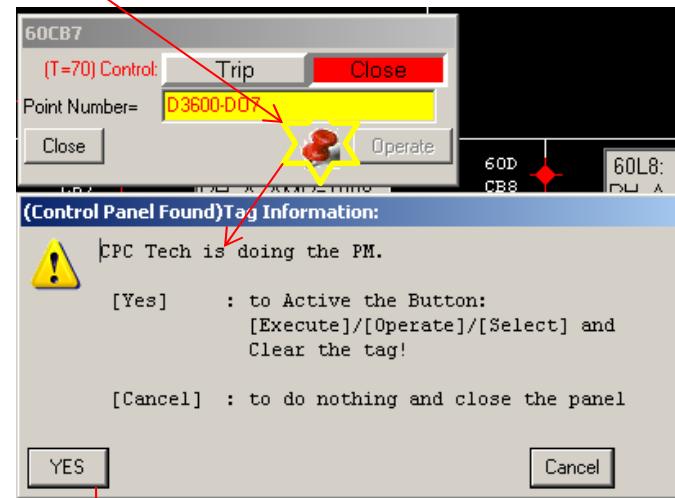
Refer to Section 4 for the configuration windows below.

22. To Apply and Remove a Tag of a control point

To add/apply a TAG to the current control point(Device), Click on it.



To check or remove the current TAG, Click on it.

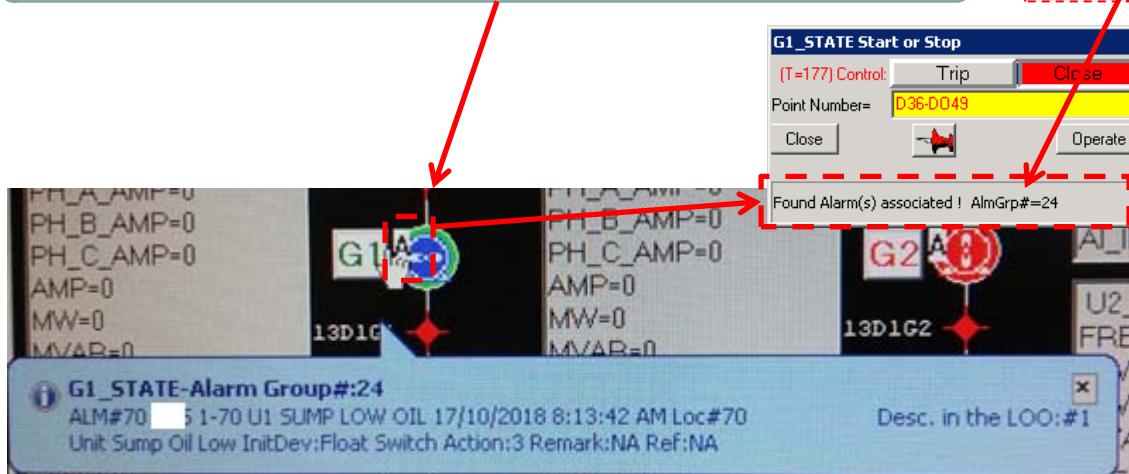


highlighted makeup by

23. To Apply an alarm to a control operation

Point Database Configuration.
Refer to Slide Section 1 and 5

You can assign an alarm group to associate with a control operation defined by a point of indication & control and alarm point(s). Operator will be alerted when try to execute a control operation. An alarm information will be shown up when the current user moves the mouse to point at between the HMI shape object and a flag of [A] – Alarming.



ENTRY NAME = G1_STATE
LONGNAME = U1-DI#1-4x08111.1 0:STOP, 1:START
FORMAT = DI
PNT_ADDR = 70
CTPL_ADDR = 48
ALARM_GROUP = 24

; ENTRY NAME = ALM#70
LONGNAME = xxx 1-70 U1 SUMP LOW OIL
FORMAT = DI
PNT_ADDR = 229
ALARM = YES
ALARM_GROUP = 24

G1_STATE Start or Stop
[T=177] Control: Trip Close
Point Number= D36-D049
Close Operate

Editing: RUS_PH_ONLINE_ALARM
Configuration Entry=93 TEXT ObjName=HMIxStaticText92 Hint=G1_STATE Start or Stop
OK Cancel < > Front Back
HMI Point and Controls Location, Colour, Params, others
HMI Point
Point Name= G1_STATE DBI=69
Long Name= U1-DI#1-4x08111.1 0:STOP, 1:START
Point Number= 70 Bit Number= 0 2STATE_ON
HMI Controls / Interaction Reset settings
Control Function= SBO-----SBO TRIP AND CLOSE
Control Point Number= 48 DevAddr in G1_STATE Control Value/Pulse Count= 1
Control Security= 0 Control Pulse Duration= 1000
 It Is A Select-Before-Operate
 Direct Operate Without Control-Panel

Unconfirmed Alarms Total=2						
No.	Description	Time	Local Alarm #	Initiating Device(s)	Action	Remarks
070	ALM#70 5 1-70 U1 SUMP LOW OIL	17/10/2018 8:13:42 AM	70	Desc:Float Switch	3	NA
071	ALM#71 1-71 U2 SUMP LOW OIL	17/10/2018 7:58:09 AM	71	Desc:Float Switch	3	NA
- Alarm Summary Setup Total=720 ALM Count=2						
No.	Description	Last Time	ACK Person	Init. Time	Init. ACKed	Point Info. AUTH_ST HMI Page Local Alarm # Initiating Device Action Remarks
170	ALM#70 1-70 U1 SUMP LOW OIL	17/10/2018 8:13:42 AM				0036/0229-OPEN 70 DesFloat Switch 3 NA
171	ALM#71 1-71 U2 SUMP LOW OIL	17/10/2018 7:58:09 AM				0036/0230-OPEN 71 DesFloat Switch 3 NA

24. To Operate data matrix

RAS: Remedial Action Schemes
 PLC: Programmable Logic Controller

Point Database Configuration.
 Refer to Slide Section 1 and 5

Define or Change the tag name of TE & Action

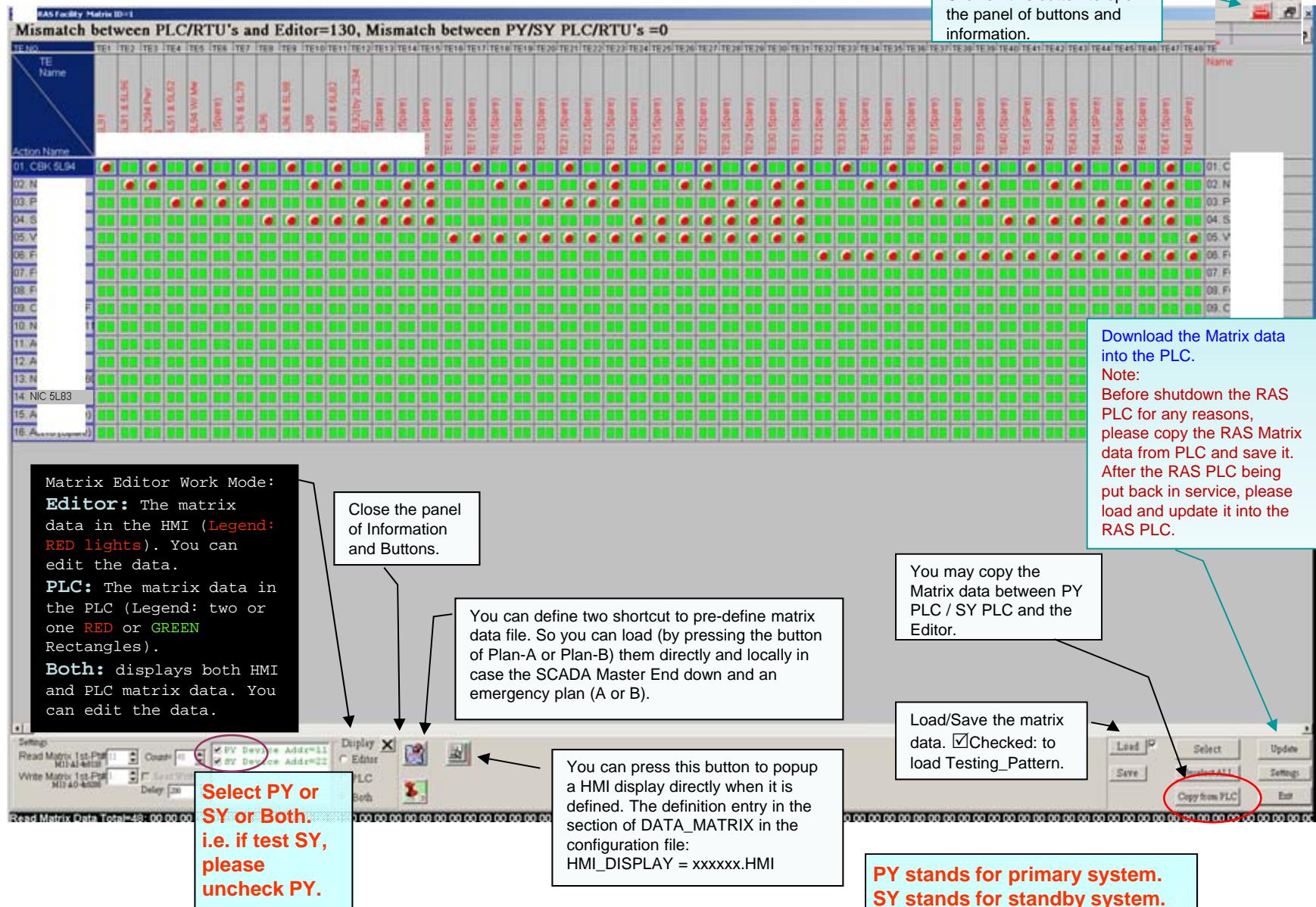
```
LABEL_CONST Station_Name_Str      xxx RAS
LABEL_CONST Station_full_Name_Str xxxxxxxxx Substation RAS
;
LABEL_CONST AREA_DCP_SITE  RTU-A to xxxDCP
LABEL_CONST SCC_DCP_SITE   RTU-B to yyyDCP
;
LABEL_CONST Matrix_Title_Str    XXX RAS Facility
;
LABEL_CONST ACT01_Str          Cxx xL9y
LABEL_CONST ACT02_Str          Nxx xL27y
LABEL_CONST ACT03_Str          Pxx xL27y
LABEL_CONST ACT04_Str          Sxx xL20y
LABEL_CONST ACT05_Str          Vxx xL21y
LABEL_CONST ACT06_Str          Fxx x8L
LABEL_CONST ACT07_Str          Fxx x3L
LABEL_CONST ACT08_Str          Fxx x6L
LABEL_CONST ACT09_Str          Cxx xL9yU/F
LABEL_CONST ACT10_Str          Nxx xRX3/4/11
LABEL_CONST ACT11_Str          Axx xCX1
LABEL_CONST ACT12_Str          Axx xCX2
LABEL_CONST ACT13_Str          Nxx xL27y&x0L28y
LABEL_CONST ACT14_Str          Nxx xL8y
LABEL_CONST ACT15_Str          Act15 (Spare)
LABEL_CONST ACT16_Str          Act16 (Spare)
;
LABEL_CONST TE01_Str           Sxx xL9y
LABEL_CONST TE02_Str           Sxx xL9y & 5L9y
LABEL_CONST TE03_Str           Cxx xL29y Pwr Swing
LABEL_CONST TE04_Str           Ixx xL5y & 5L5y
LABEL_CONST TE05_Str           Cxx xL9y W/ Mw Supvn
LABEL_CONST TE06_Str           TE06 (Spare)
LABEL_CONST TE07_Str           Nxx xL7y & 5L7y
LABEL_CONST TE08_Str           Sxx xL9y
LABEL_CONST TE09_Str           Nxx xL9y & 5L9y
LABEL_CONST TE10_Str           Nxx xL9y
LABEL_CONST TE11_Str           Nxx xL8y & 5L8y
LABEL_CONST TE12_Str           Cxx xL9y(by 2L29y CLOSE)
LABEL_CONST TE13_Str           Nxx xL8y & 5L8y
LABEL_CONST TE14_Str           Nxx xL8y & 5L8y
LABEL_CONST TE15_Str           TE15 (Spare)
LABEL_CONST TE16_Str           TE16 (Spare)
LABEL_CONST TE17_Str           TE17 (Spare)
LABEL_CONST TE18_Str           TE18 (Spare)
LABEL_CONST TE19_Str           TE19 (Spare)
LABEL_CONST TE20_Str           TE20 (Spare)
```

LABEL_CONST	TE21_Str	TE21 (Spare)
LABEL_CONST	TE22_Str	TE22 (Spare)
LABEL_CONST	TE23_Str	TE23 (Spare)
LABEL_CONST	TE24_Str	TE24 (Spare)
LABEL_CONST	TE25_Str	TE25 (Spare)
LABEL_CONST	TE26_Str	TE26 (Spare)
LABEL_CONST	TE27_Str	TE27 (Spare)
LABEL_CONST	TE28_Str	TE28 (Spare)
LABEL_CONST	TE29_Str	TE29 (Spare)
LABEL_CONST	TE30_Str	TE30 (Spare)
LABEL_CONST	TE31_Str	TE31 (Spare)
LABEL_CONST	TE32_Str	TE32 (Spare)
LABEL_CONST	TE33_Str	TE33 (Spare)
LABEL_CONST	TE34_Str	TE34 (Spare)
LABEL_CONST	TE35_Str	TE35 (Spare)
LABEL_CONST	TE36_Str	TE36 (Spare)
LABEL_CONST	TE37_Str	TE37 (Spare)
LABEL_CONST	TE38_Str	TE38 (Spare)
LABEL_CONST	TE39_Str	TE39 (Spare)
LABEL_CONST	TE40_Str	TE40 (Spare)
LABEL_CONST	TE41_Str	TE41 (SPare)
LABEL_CONST	TE42_Str	TE42 (Spare)
LABEL_CONST	TE43_Str	TE43 (Spare)
LABEL_CONST	TE44_Str	TE44 (SPare)
LABEL_CONST	TE45_Str	TE45 (Spare)
LABEL_CONST	TE46_Str	TE46 (Spare)
LABEL_CONST	TE47_Str	TE47 (Spare)
LABEL_CONST	TE48_Str	TE48 (SPare)
LABEL_CONST	LocTrip01_Str	ACT01_Str
LABEL_CONST	LocTrip02_Str	ACT02_Str
LABEL_CONST	LocTrip03_Str	ACT03_Str
LABEL_CONST	LocTrip04_Str	ACT04_Str
LABEL_CONST	LocTrip05_Str	ACT05_Str
LABEL_CONST	LocTrip06_Str	ACT06_Str
LABEL_CONST	LocTrip07_Str	ACT07_Str
LABEL_CONST	LocTrip08_Str	ACT08_Str
LABEL_CONST	LocTrip09_Str	ACT09_Str
LABEL_CONST	LocTrip10_Str	ACT10_Str
LABEL_CONST	LocTrip11_Str	ACT11_Str
LABEL_CONST	LocTrip12_Str	ACT12_Str
LABEL_CONST	LocTrip13_Str	ACT13_Str
LABEL_CONST	LocTrip14_Str	ACT14_Str
LABEL_CONST	LocTrip15_Str	ACT15_Str
LABEL_CONST	LocTrip16_Str	ACT16_Str

24. To Operate data matrix

continue

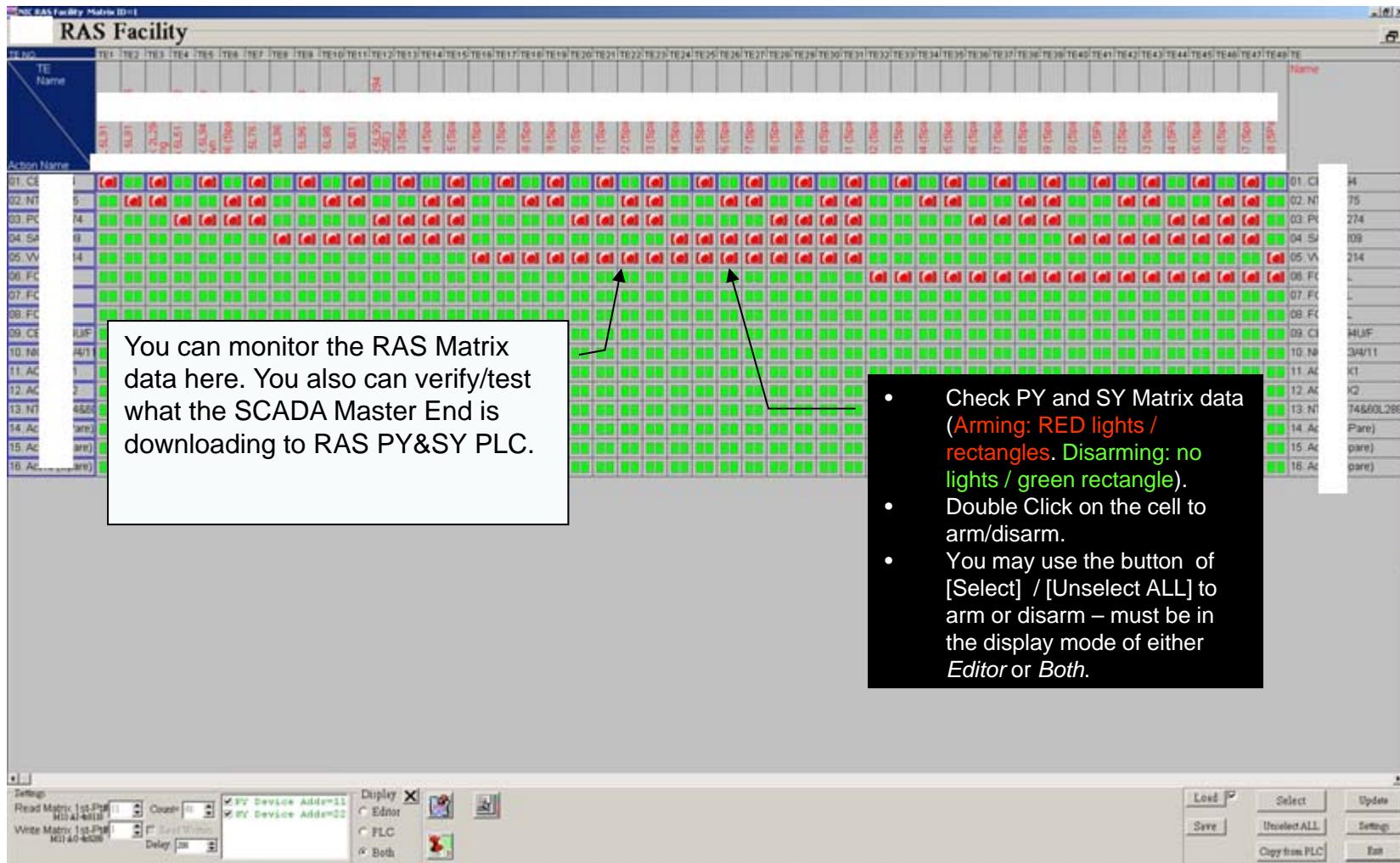
Matrix Editor - main



24. To Operate data matrix

continue

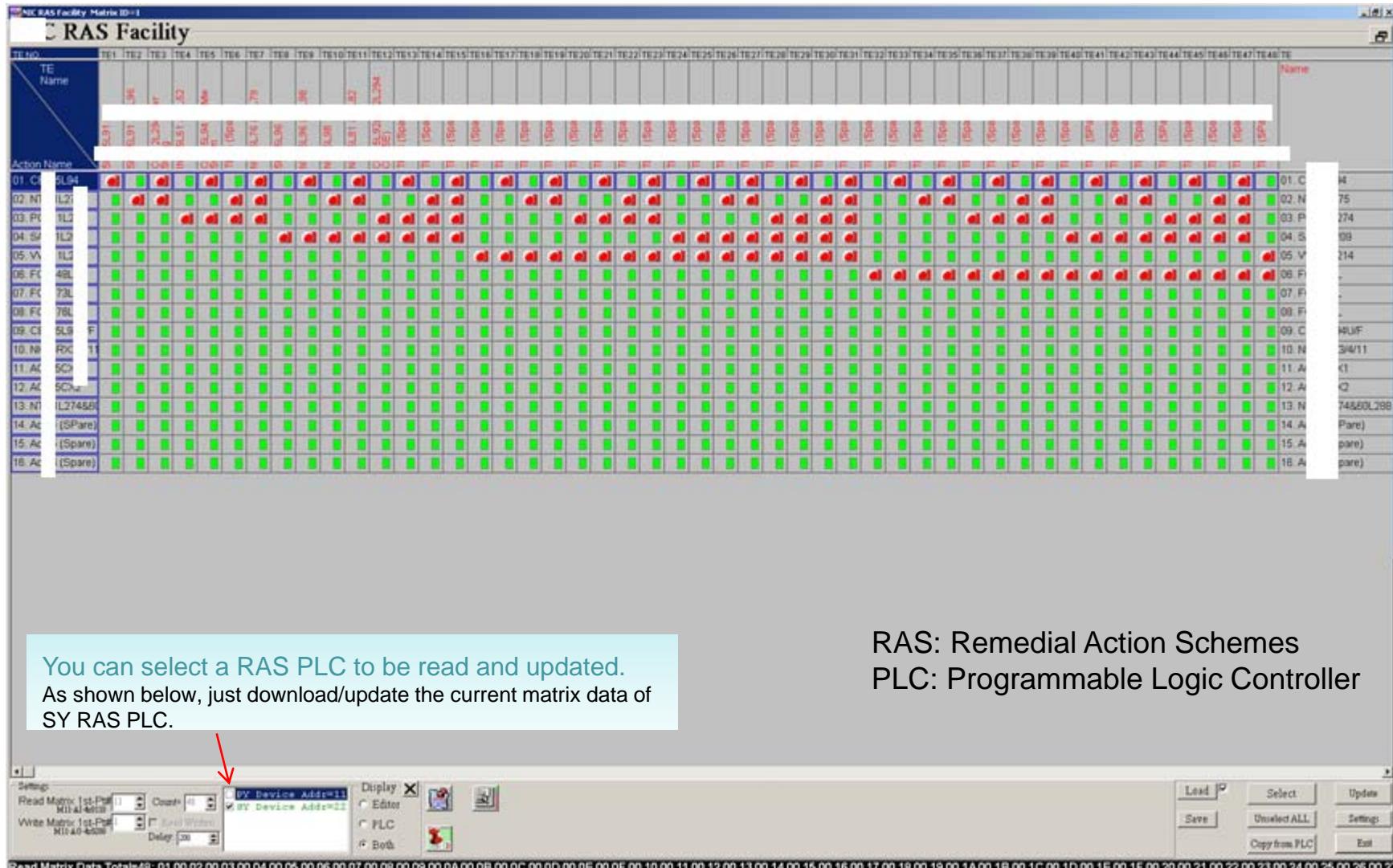
Matrix Editor – main after update RAS PLC Matrix Buffer



24. To Operate data matrix

continue

Matrix Editor – Select & Update one of RAS PLC Matrix Buffer



RAS: Remedial Action Schemes
PLC: Programmable Logic Controller

24. To Operate data matrix

continue

Matrix Editor – Mismatch RAS PLC Matrix

Mismatch between PLC/RTU's and Editor=0, Mismatch between PY/SY PLC/RTU's = 132

The information about mismatched matrix.

It tells you how many mismatched-unit(s) in both PLC (PY/SY) and this Matrix Editor.

It tells you how many mismatched-unit(s) in both PY PLC and SY PLC.

The state (OFF) in the PY PLC Matrix.

The state (ON) in the SY PLC Matrix.

If mismatch data between future points, SCADA Master End may not download (force) the data. To resolve the mismatch, manual-download(force) the Matrix data via HMI is required.

25. To Setup and download a Setting-Table (production recipe)

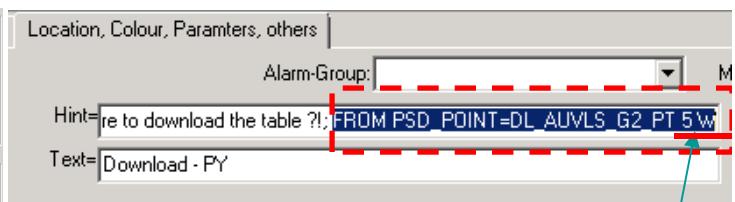
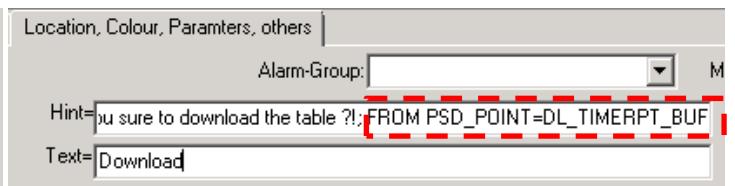
Refer to slides in Section 18.
A Setting-Table by pseudo
Analog Input points.

Name	value	Name
DL_AUMLS_G2_PT	2000	DL_OI
DL_AUMLS_G3_PT	4000	DL_OI
DL_AUMLS_G4_PT	6000	DL_OI
DL_AUMLS_G5_PT	8000	DL_OI
DL_AUMLS_G6_PT	10000	DL_OI

```

;PSD AI=====
ENTRY      METER_NAME = *, DL_TS_AUMLS
;
ENTRY      NAME      = DL_AUMLS_G2_PT
LONGNAME   = PSD:HMI_SV
FORMAT     = PSD_AI
PNT_ADDR   = 0
D_TYPE     = AI
PROCTYPE   = AI
PSD_AI_DEFAULT_PV = 2000
RANGE      = 65535 ms 16BIT_REG
;
ENTRY      NAME      = DL_AUMLS_G3_PT
LONGNAME   = PSD:HMI_SV
FORMAT     = PSD_AI
PNT_ADDR   = 0
D_TYPE     = AI
PROCTYPE   = AI
PSD_AI_DEFAULT_PV = 4000
RANGE      = 65535 ms 16BIT_REG
;
ENTRY      NAME      = DL_AUMLS_G4_PT
LONGNAME   = PSD:HMI_SV
FORMAT     = PSD_AI
PNT_ADDR   = 0
D_TYPE     = AI
PROCTYPE   = AI
PSD_AI_DEFAULT_PV = 6000
RANGE      = 65535 ms 16BIT_REG
;
ENTRY      NAME      = PY_AUMLS_G2_PT
LONGNAME   = PSD:HMI_SV
FORMAT     = PSD_AI
PNT_ADDR   = 73
CTRL_ADDR  = 66
PNT_DEV    = 11
METER      = *
RANGE      = 65535 ms 16BIT_REG
;
ENTRY      NAME      = DL_AUMLS_G5_PT
LONGNAME   = PSD:HMI_SV
FORMAT     = PSD_AI
PNT_ADDR   = 0
D_TYPE     = AI
PROCTYPE   = AI
PSD_AI_DEFAULT_PV = 8000
RANGE      = 65535 ms 16BIT_REG
;
ENTRY      NAME      = DL_AUMLS_G6_PT
LONGNAME   = PSD:HMI_SV
FORMAT     = PSD_AI
PNT_ADDR   = 0
D_TYPE     = AI
PROCTYPE   = AI
PSD_AI_DEFAULT_PV = 10000
RANGE      = 65535 ms 16BIT_REG
;
ENTRY      NAME      = DL_TimerPT_Buf
LONGNAME   = PSD:HMI_SV
FORMAT     = PSD_AI
PNT_ADDR   = 0
D_TYPE     = AI
PROCTYPE   = AI
PSD_AI_DEFAULT_PV = 1000
RANGE      = 65535 ms 16BIT_REG

```



5: means 5 consecutive points.

W: means a data format of 16bit Word.

← Point Database Configuration.
Refer to Slide Section 1 and 5

```

ENTRY      NAME      = PY_AUMLS_G2_PT
LONGNAME   = PY_AUMLS_G2_PT
FORMAT     = AI
PNT_ADDR   = 73
CTRL_ADDR  = 66
PNT_DEV    = 11
METER      = *
RANGE      = 65535 ms 16BIT_REG

```

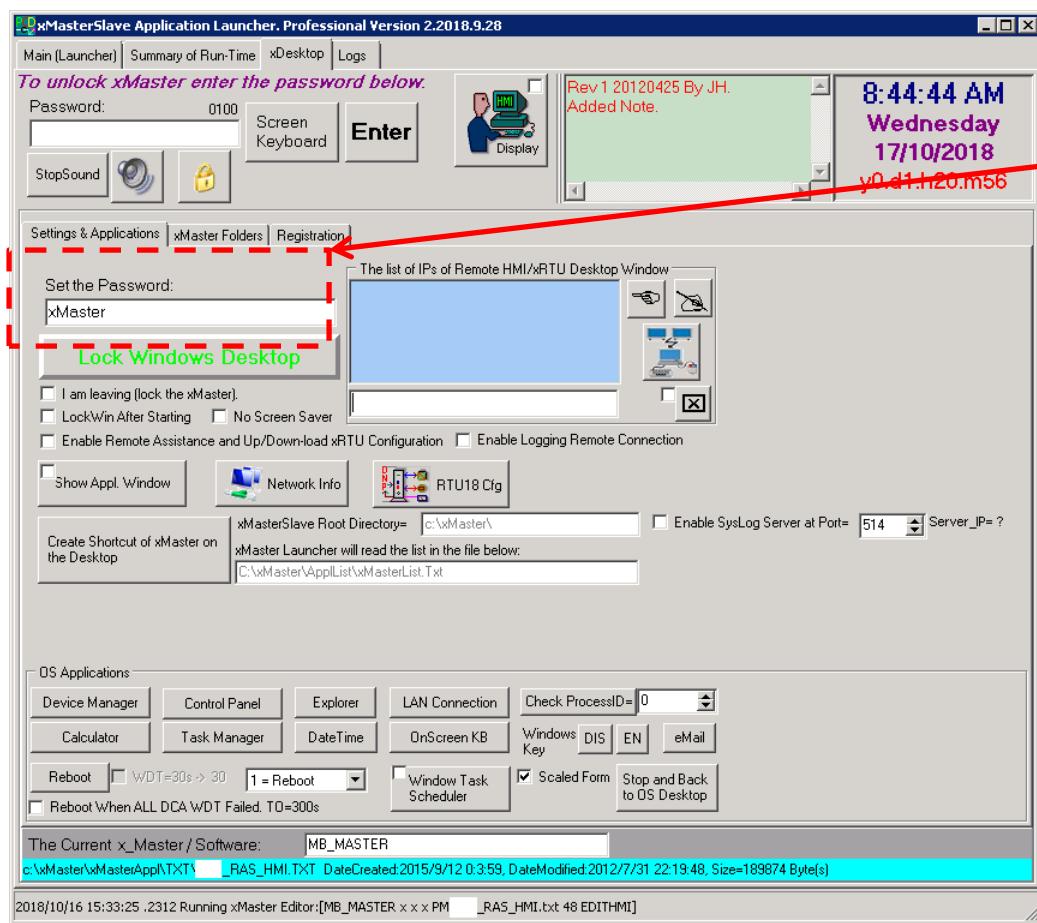
26. To Disable HMI Controls



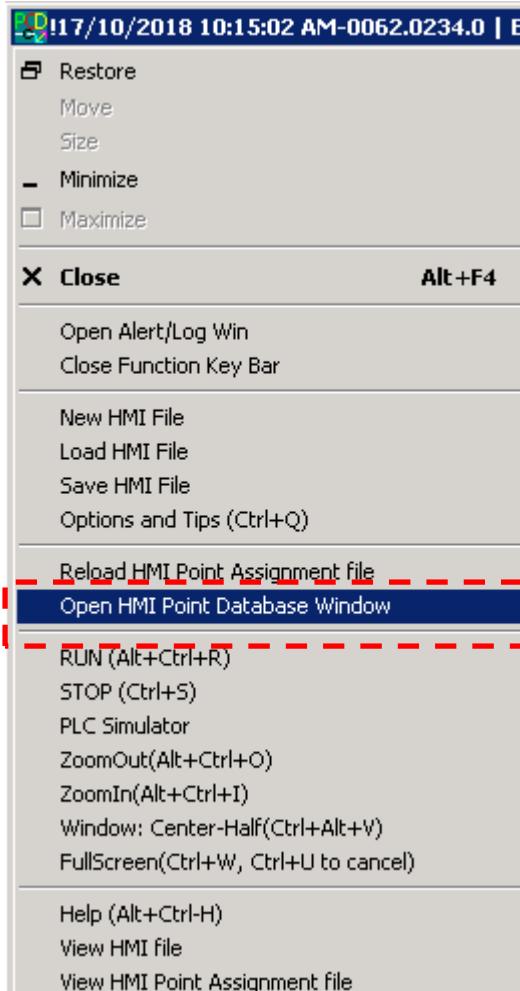
Refer to the section 8.

Please find the button of [Lockout] on the bar of Function Key.

You may change the password in xMaster/xDesktop/ Set the Password.



27. To Check Point database



Refer to Section 1 and 8.

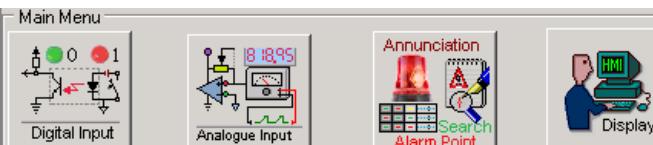
You can open a window of a database of either HMI data point or Data Collection Application (DCA). A HMI data point is defined by either a default database or individual one(s). A Sample as follows:

```
ENTRY      NAME      = PSD_DI_CF
          LONGNAME  = PSD_DI Slave Comm. failed
          FORMAT    = PSD_DI
          PNT_ADDR   = 0
          PROCTYPE   = ONOFF
          STATCONV   = NO
          PSD_DI_FUNC = COMM_FAILED
          PSD_DI_CTRL1 = 11 0
          ALARM      = YES
          ALARM_GROUP = 255
```

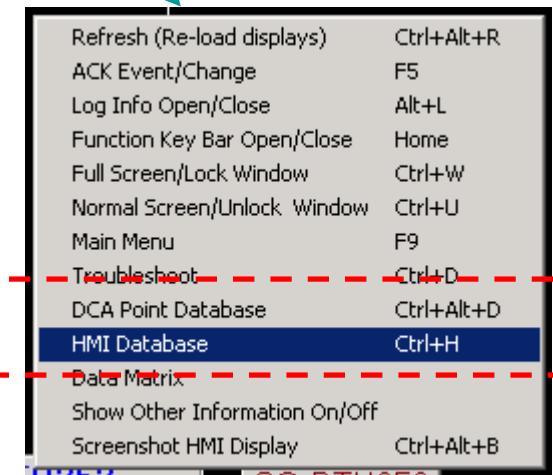
A DCA point database is defined by entries of DEV-DATABASE. A Sample as follows:

```
ENTRY      DEV_DATABASE = SIZE
;
SESSION = 0
;
POLL_CLASS2 = NO
;
POLL_CLASS3 = NO
;
SAVE_RUNNING_CNT = YES
;
READ_DNP_OBJ_RESPECTIVELY = YES
MAX_DI = 928
MAX_DO = 96
MAX_AI = 64
MAX_AO = 1
MAX_CNT = 0
```

END



A Right-Click on the HMI display to popup this menu.



The Main Menu.

27. To Check Point database

continue

HMI Points Database

The screenshot shows the 'HMI Points Database Engine' application window. The main area displays a table of HMI points with columns: DB Index, Point Name, Long Name, Dev Addr/Pnt#, Pv(Present Value), Flag, and Type. A tooltip box with a blue border and white text says 'Search a point.' with an arrow pointing to the search bar at the top of the window.

A red arrow points from the bottom of the tooltip to the bottom of the table, where it highlights the last row (Point Name: D02S1-19). Another red arrow points from the bottom of the table to a second tooltip box. This second tooltip box has a green border and white text and says 'Check raw information for the current point when you select a point via a double-click on the line.'

At the bottom of the window, there is a status bar with various configuration options and a log message:

HMI Database was built at 17/10/2018 8:53:08 AM

...
End processing HMI Local Database configuration File:c:\wMaster\wMasterApp\TXT\RUSKIN\PL_RTU_LAN.txt. Total Valid Entry Count=1563

Disable Saving History Data Enable Scaling HMI_DB_Point Enable Show DCA & HMI_Db Do Not Display the Flag Of Offline/Failure
 Put the Flag in Inside of the Shape Always_Display_Alarm_Flag_A Show Al_PV_Offline Updating the HMI_DB_By Engine Directly

Reset All Values in DB TakeSnapShot Integrity Poll

Below the status bar, two rows of data are shown with red arrows pointing to specific cells:

1389	60L8_MVR	(642) SEL2C 0036/Pnt20.4.55191440 0001 Online ANALOG IN	327.67	-327.67	327.67	-327.67	327.67	-327.67	32767	32767	327.67	-327.68
1390	60L8_PH_A	(943) SEL2C 0036/Pnt21.4.55191440 0001 Online ANALOG IN	327.67	-327.67	327.67	-327.67	327.67	-327.67	32767	32767	327.67	-327.68

9:53:16 AM 60L8_MVR Pnt#=20 Dev#=36 Obj#=2555/2 Attr=05 DFB=00 Fw=01 x0=2555 xA=05 xF=00/00, RawPV_F=0.00(LV=0/DW=00000000H), EngHi=327.7, EngLo=-327.7
AlmHi=327.7, AlmLo=-327.7, WarHi=327.7, WarLo=-327.7, RsbHi=327.7, RsbLo=-327.7, RawHi=32767.0, RawLo=32767.0, Ddb=0.0
Invalid Divisor. Forced to +32767 to -32768

27. To Check Point database

continue

DCA Points Database – RAW DATA

2018/10/17 10:32:35 .2653 Successful Login

Point Database | Administrator & Setup | Configuration for data acquisition | Logs

No	Addr. Point Name	Present Value	Last Value	Flag	Time Date
*0001	00036 D36-DI1 Dev#00036 Status #0000 Pri#0 Dat OFF	OFF	OFF	8001	214ms 08:53:24 Oct 17
*0002	00036 D36-DI2 Dev#00036 Status #0001 Pri#0 Dat OFF	OFF	OFF	8001	214ms 08:53:24 Oct 17
*0003	00036 D36-DI3 Dev#00036 Status #0002 Pri#0 Dat OFF	OFF	OFF	8001	214ms 08:53:24 Oct 17
*0004	00036 D36-DI4 Dev#00036 Status #0003 Pri#0 Dat OFF	OFF	OFF	8001	214ms 08:53:24 Oct 17
*0005	00036 D36-DI5 Dev#00036 Status #0004 Pri#0 Dat OFF	OFF	OFF	8001	214ms 08:53:24 Oct 17
*0006	00036 D36-DI6 Dev#00036 Status #0005 Pri#0 Dat OFF	OFF	OFF	8001	214ms 08:53:24 Oct 17
*0007	00036 D36-DI7 Dev#00036 Status #0006 Pri#0 Dat OFF	OFF	OFF	8001	214ms 08:53:24 Oct 17
*0008	00036 D36-DI8 Dev#00036 Status #0007 Pri#0 Dat OFF	OFF	OFF	8001	214ms 08:53:24 Oct 17
*0009	00036 D36-DI9 Dev#00036 Status #0008 Pri#0 Dat OFF	OFF	OFF	8001	214ms 08:53:24 Oct 17
*0010	00036 D36-DI10 Dev#00036 Status #0009 Pri#0 Da OFF	OFF	OFF	8001	214ms 08:53:24 Oct 17
*0011	00036 D36-DI11 Dev#00036 Status #0010 Pri#0 Da OFF	OFF	OFF	8001	214ms 08:53:24 Oct 17
*0012	00036 D36-DI12 Dev#00036 Status #0011 Pri#0 Da OFF	OFF	OFF	8001	214ms 08:53:24 Oct 17
*0013	00036 D36-DI13 Dev#00036 Status #0012 Pri#0 Da OFF	OFF	OFF	8001	214ms 08:53:24 Oct 17
*0014	00036 D36-DI14 Dev#00036 Status #0013 Pri#0 Da OFF	OFF	OFF	8001	214ms 08:53:24 Oct 17
*0015	00036 D36-DI15 Dev#00036 Status #0014 Pri#0 Da OFF	OFF	OFF	8001	214ms 08:53:24 Oct 17
*0016	00036 D36-DI16 Dev#00036 Status #0015 Pri#0 Da OFF	OFF	OFF	8001	214ms 08:53:24 Oct 17

DNP Master Version 2.2018.9.28-32 -- Written by JH since 1986. Registered User:

2018/10/18 09:51:21 .8663 Reset Integrity Polling Interval Timer.

Point Database | Administrator & Setup | Configuration for data acquisition | Logs

Session	Point Database Size Reported By DCA	Event Info	Functions
0-0	Addr#36 DI=4096 AI=1024 CNT=64 DO=512 AO=64		<input type="checkbox"/> Tag Name
			<input type="checkbox"/> DCA Info

1-36 Tx=24/49481 Rx=1/138470 LAN TCP DNP3 (c) 10:33:02 AM, Total Transactions=2067, CRCErr=0, No Reply/Bad Reply=1, TracingCode=01002000 IIN=0000

Functions

Tag Name

NORMAL

Goto: Line No.

1 Pg

Clear Changed *

Monitor

DE AE

Open OneLine Diagram

Alarm Recorder

PLC Program

Integrity Poll

SOE Viewer

28. To Support multi-site via the same display-set

A Data Concentrator (RTU) system is connected to a multi-site system (i.e. Pole-Top IED/Controller for Electrical Power Distribute Network). Sites are divided by several groups. Each group is installed the same IED/RTU/PLC. Each group has the same HMI display.

You do not want to build displays for all sites. There is a solution to simplify it. All you need to do is just build displays for each group with the same configuration. xMaster Application automatically shift and replace the point database in HMI shape objects automatically.

Refer to Revision Note#161
2016-Dec-18, #155 2016-June-18 in ReadMe.pdf or ReadMe.txt

```
ENTRY HMI_SITE = 01 SW#: 827xx~xxL 25F51~F6_TS1_Panel
ENTRY HMI_SITE = 02 SW#: 827xx~xxL 25F51~F6_TS1_Panel
ENTRY HMI_SITE = 03 SW#: 834xx~xxT 25F52~F6_TS1_Panel
ENTRY HMI_SITE = 04 SW#: 834xx~xxT 25F52~F6_Panel_1
ENTRY HMI_SITE = 05 SW#: 834xx~xxT 25F52~F6_Panel_1
ENTRY HMI_SITE = 06 SW#: 829xx~xxK 25F52~F6_Panel_1
ENTRY HMI_SITE = 07 SW#: 829xx~xxK 25F52~F6_Panel_1
ENTRY HMI_SITE = 08 SW#: 829xx~xxK 25F52~F6_Panel_1
ENTRY HMI_SITE = 09 SW#: DDCxxT1~ ZZZ TEST~F6_Panel_1
ENTRY HMI_SITE = 10 SW#: 142xx~xxK 25F51~F6_Panel_1
ENTRY HMI_SITE = 11 SW#: 142xx~xxK 25F51~F6_Panel_1
ENTRY HMI_SITE = 12 SW#: 142xx~xxK 25F51~F6_Panel_1
;
ENTRY      DI_SITE_PARTITION = 0, 35
ENTRY      DO_SITE_PARTITION = 0, 19
ENTRY      AI_SITE_PARTITION = 0, 29
;ENTRY     AO_SITE_PARTITION = 0, 16
;ENTRY     CNT_SITE_PARTITION = 0, 16
;ENTRY     BRS_SITE_PARTITION = 0, 16
;ENTRY     FR_SITE_PARTITION = 0, 16
;ENTRY     9X_SITE_PARTITION = 0, 16
;ENTRY     TDI_SITE_PARTITION = 0, 16
;ENTRY     TAI_SITE_PARTITION = 0, 16
;ENTRY     FPAO_SITE_PARTITION = 0, 16
;ENTRY     DWAO_SITE_PARTITION = 0, 16
;
ENTRY      NAME      = PSD_SiteID
FORMAT      = PSD_AI
LONGNAME   = PSD:HMI_SPD_ID
METER       = *
PNT_ADDR    = 0
```

```
;=====STATUS=====
ENTRY      NAME      = F6_A_CL
LONGNAME  = F6_A SW CL
FORMAT    = DI
;          PNT_DEV   = 1700
PNT_SITE   = 0
PNT_ADDR   = 0
CTRL_ADDR  = 0
;          ALARM     = YES
;          ALARM_GROUP = 1
;          SHARING_PNT = YES
;

;=====ANALOG=====
ENTRY      NAME      = A_MW
LONGNAME  = A Phase MW
FORMAT    = AI
PNT_SITE   = 0
PNT_ADDR   = 12
METER     = *
;          HI_EUVAL  = +3276.7
;          LO_EUVAL  = -3276.8
;          HI_SCALE   = 32767
;          LO_SCALE   = -32768
;          HI_SCALE   = 0.1
;          LO_SCALE   = 0.1
ENG_UNIT   = DEC
ENG_NAME   = A_KW
```

Point Database Configuration.
Refer to Slide Section .

28. To Support multi-site via the same display-set

continue

Refer to the previous slide

Step 1: Select a site from either a drop list or HMI Page Path (Key: F1)

The configuration for this drop list

Editing: F6_TS1_Panel

Point Name: PSD_SITEID	DBI=1	
Long Name: PSD:HMI_SPD_ID		
Point Number: 0	Bit Number: 0	ANALOG INPUT

HMI Controls / Interaction:

- Control Function: NONE
- Control Point Number: -1
- Control Value/Pulse Count: 1
- Control Security: 0
- Control Pulse Duration: 1000

It Is A Select-Before-Operate
 Direct Operate Without Control-Panel

Editing: F6_TS1_Panel

Configuration Entry=71 TEXT ObjName=HMIxStaticText70 Hint=GND_FAULT_TRIP was found Changed at DT_STAMP=

OK	Cancel	<	>	Front	Back
HMI Point and Controls Location, Colour, Parameters, others					
HMI Point					
Point Name: GND_FAULT_TRIP DBI=114					
Long Name: GND Fault Trip					
Point Number: 31 Bit Number: 0 2STATE_ON					

xMaster

F6_LOC_SUPPORT
The List
Analog:
Binary:
Binary:
Binary:
Binary:

Hint: GND_FAULT_TRIP was found Changed at DT_STAMP=

Text: GND-PHASE FAULT

Text Animation:

- DISPLAY_NORMAL
- DISPLAY_INT
- DISPLAY_ENCODE_INFO
- DISPLAY_FLOAT
- DISPLAY_STRING_TEMPLATE

HMI Page Path Tree (xMaster)

No.	Site Name	Site Information	Site HMI Page	DIB Offset	DIO Offset	AIO Offset	AOB Offset	CNT16C Off	CNT32C Off	...
1	SW1	AT	SW1_TS1_Panel	N/A	N/A	N/A	N/A	N/A	N/A	...
2	SW2	AT	SW2_TS1_Panel	N/A	N/A	N/A	N/A	N/A	N/A	...
3	SW3	SP	SW3_TS1_Panel	N/A	N/A	N/A	N/A	N/A	N/A	...
4	SW4	SP	SW4_TS1_Panel	N/A	N/A	N/A	N/A	N/A	N/A	...
5	SW5	SP	SW5_TS1_Panel	N/A	N/A	N/A	N/A	N/A	N/A	...
6	SW6	AS	SW6_TS1_Panel	N/A	N/A	N/A	N/A	N/A	N/A	...
7	SW7	AS	SW7_TS1_Panel	N/A	N/A	N/A	N/A	N/A	N/A	...
8	SW8	AS	SW8_TS1_Panel	N/A	N/A	N/A	N/A	N/A	N/A	...
9	SW9	IC2311	SW9_TS1_Panel	N/A	N/A	N/A	N/A	N/A	N/A	...
10	SW10	22	SW10_TS1_Panel	N/A	N/A	N/A	N/A	N/A	N/A	...
11	SW11	AT	SW11_TS1_Panel	N/A	N/A	N/A	N/A	N/A	N/A	...
12	SW12	AT	SW12_TS1_Panel	N/A	N/A	N/A	N/A	N/A	N/A	...
13										...
14										...
15										...

"DT_STAMP=" is to show Time&Date stamp in its hint.

29. To Schedule and Trigger a user defined Task or Application

Refer to Section 1.4.15 in the manual.

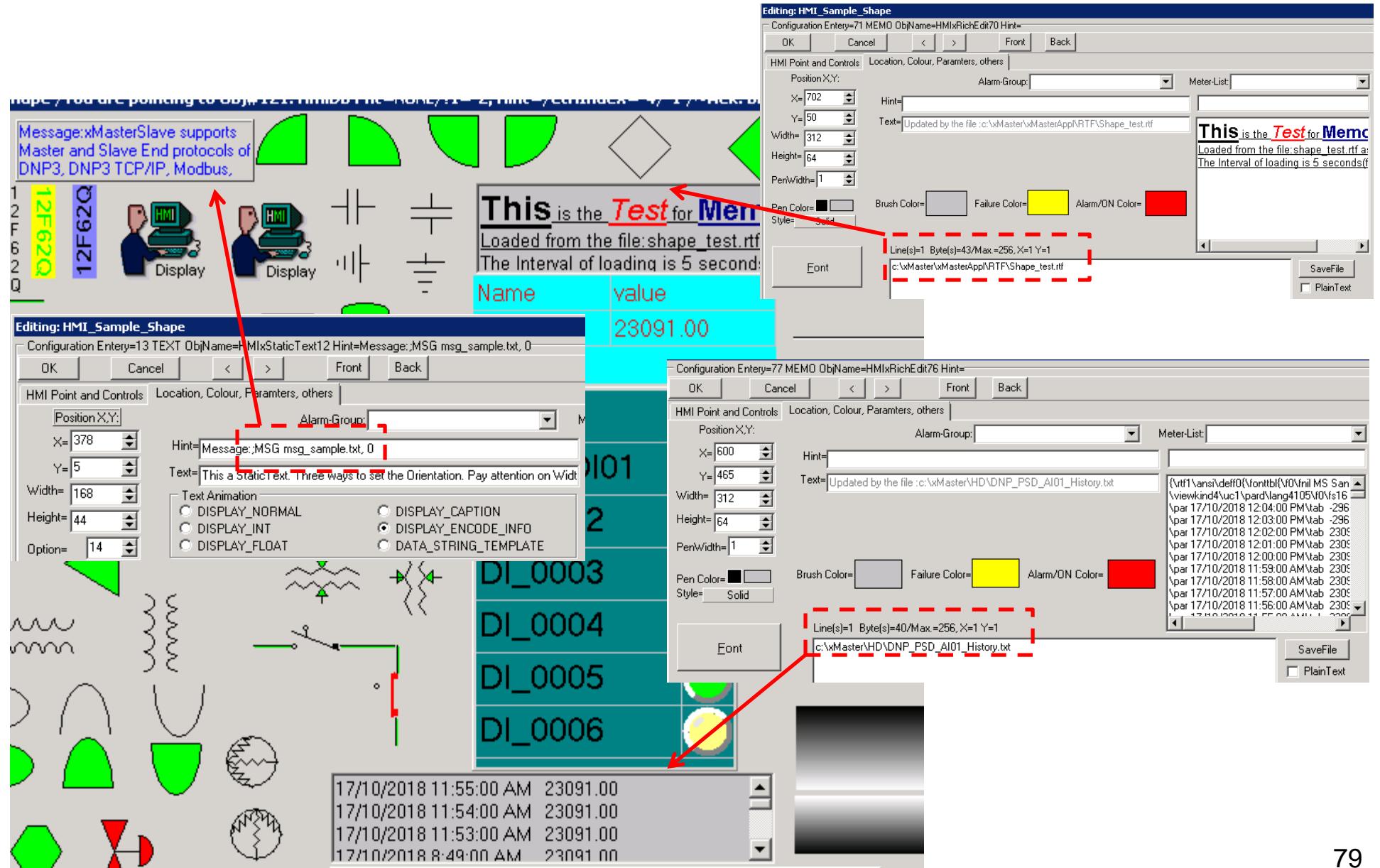
Samples: Refer to DNP_Master_Sample.txt. In this sample, once PSD_DI01 is ON, Task#1 will run Windows application Calc.exe. Task#2 will run Write.exe to open the file of C:\xMaster\xMasterApp\RTF\DataStringTemp_Sample.rtf.

Point Database Configuration.
Refer to Slide Section .

```
ENTRY XMYTASK
      TASK_ID = 1
      TASK_NAME = OnCall#1
      TASK_TYPE = BEGIN_TO_DO_UNTIL_END
;
      BEGIN_TO_DO_UNTIL_END
;
      BEGIN_END_AFTER_SECONDS_TO_DO
;
      EVERY_SECONDS //>=3
;
      EVERY_MINUTE_AT_SECOND
;
      EVERY_HOUR_AT_MINUTE
;
      EVERY_DAY_AT_HOUR
;
      EVERY_WEEK_AT_WEEKDAY
;
      EVERY_MONTH_AT_DAY
;
      KEYBAR_F8
      BEGIN_EVENT = PSD_DI01
      END_EVENT = PSD_DI01
;
      DI_0001
      MY_TASK = 1 EXECUTE calc.exe
      MY_TASK = 2 EXECUTE write.exe DataStringTemp_Sample.rtf
;
      TaskNo EXECUTE COMMAND_LINE
;
      TaskNo PRINT FILE_NAME/DATA_DEFINITION_TEMPLATE
;
      TaskNo SAVEDATA LOAD_FILE_NAME SAVE_FILE_NAME
;
      TaskNo ADDDATA FILE_NAME DATA_DEFINITION_TEMPLATE DATETIME HMI_POINT_DATABASE_TAGNAME UP TO 4095 CHARACTERS
;
      TaskNo DOWNLOAD FILE_NAME
;
      TaskNo EMAIL TO_WHO SUBJECT ATTACHMENT(NONE) MESSAGEBODYTEXT
      INTERVAL = 5000
;
      TASK_YEAR =
;
      TASK_MONTH =
;
      TASK_DAY =
;
      TASK_WEEK =
;
      TASK_HOUR =
;
      TASK_MINUTE =
;
      TASK_SECOND =
;
      EMAIL_HOST =
;
      EMAIL_USERID =
;
      EMAIL_ADDR =
;
      END
```

30. To Display & Load file dynamically

Refer to Section 7.3.12 and 7.3.21 in the manual. Samples: Refer to DNP_Master_Sample.txt.



31. To Support dial-up connection

Refer to Section 12 in the xMaster manual.

Samples: Refer to DNP_Master_Dialup_Sample.txt. In this sample, there is phone book defined by the file of C:\xMaster\xMasterApp\TXT\PhoneBook1 .txt.

The screenshot shows the 'Dial up Modem' application window with several callouts pointing to different parts of the interface:

- The Modem Status.**: Points to the top status bar which displays 'Modem Status: 00000010 [CTS][Rx=6/27][Tx=13/56]' and 'Not Connected to:1111111'.
- The Modem Communication Logs.**: Points to the log window showing modem initialization logs and a failed connection attempt.
- Select-Call [X] or Unselect-Call [] it by double-clicking on the current site. You can use buttons to [Select All] / [Unselect All] to select/unselect all sites in the list.**: Points to the list of remote sites in the table.
- Timeout progress. The timeout for dialing and Modem connection is 45 seconds.**: Points to the timeout configuration section at the bottom.
- Dial or Hang up Phone/Modem.**: Points to the 'Dial Up Modem' button at the bottom.
- The connection-timer is to define how much time to poll/scan the remote site. The default is 45 seconds.**: Points to the timeout value '45'.
- The phone book is a Text-Formatted file. Each line in the file is the phone number information and another two segments separated by the character: Tab (09). The 1st segment is the phone number. The 2nd is the name/information of the remote end. The 3rd is the others, slave address, for example. Refer the section 1.4.6 for the definition of Phone Book File Name in xMasterSlave Manual..**: Points to the right pane containing the 'PhoneBook1.txt' file content.

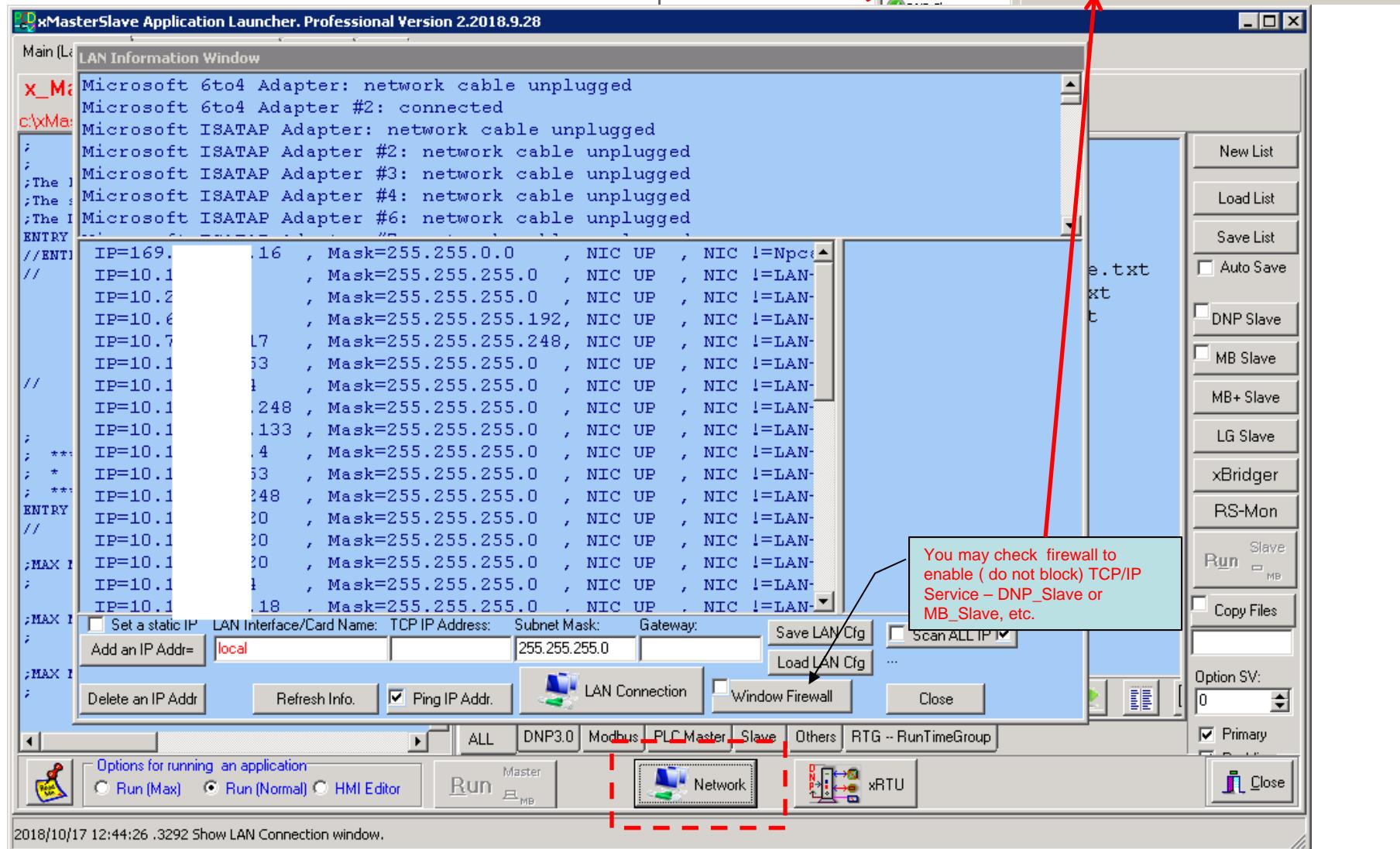
PhoneBook1.txt Content:

```
ENTRY      DNP_LINK      = MODEM
PORT       = 3
PHONE_NO   = PhoneBook1
BAUDRATE   = 2400
CONTROL_TIMEOUT = 4
LINK_TIMEOUT = 5000
ADDR       = 31
END
```

No.	Call	Tel-No.	Name	Others
1	X	1111111	Site#1	SlaveAddress=1234
2	X	2222222	Site#2	DeviceAddress=1234
3	X	3333333	Site#3	DA=1234
4	X	4444444	Site#4	NODE=1234

32. To Manage IP Address

Open and check HMI PC IP /network information directly in xMaster



32. To Manage IP Address

continue

Assign IP address of DNP3 / Modbus Slave End: RTU/PLC/IED

The screenshot shows the Windows Network icon in the system tray, followed by the LAN Information Window displaying network adapter status and connection details. A callout box points to the 'Add' button in the TCP/IP Address dialog, which is overlaid on the LAN Connection Properties window. The TCP/IP Address dialog shows an IP address of 10.1.1.1 and a subnet mask of 255.255.255.0.

Assign Multi-IP address to the current computer NIC.

In the Tab of [Local IP List] in xMaster window:
Add all slave IP address here directly or press the button of [LAN Connection] to get into the window of Network Interface Card (NIC) Properties → TCP/IP → Advanced → IP Settings [Add].

Select the NIC Name and modify the IP Address. To set multi IP address, for example, you can set the 31 IP addresses: 10.1.2.21-51.

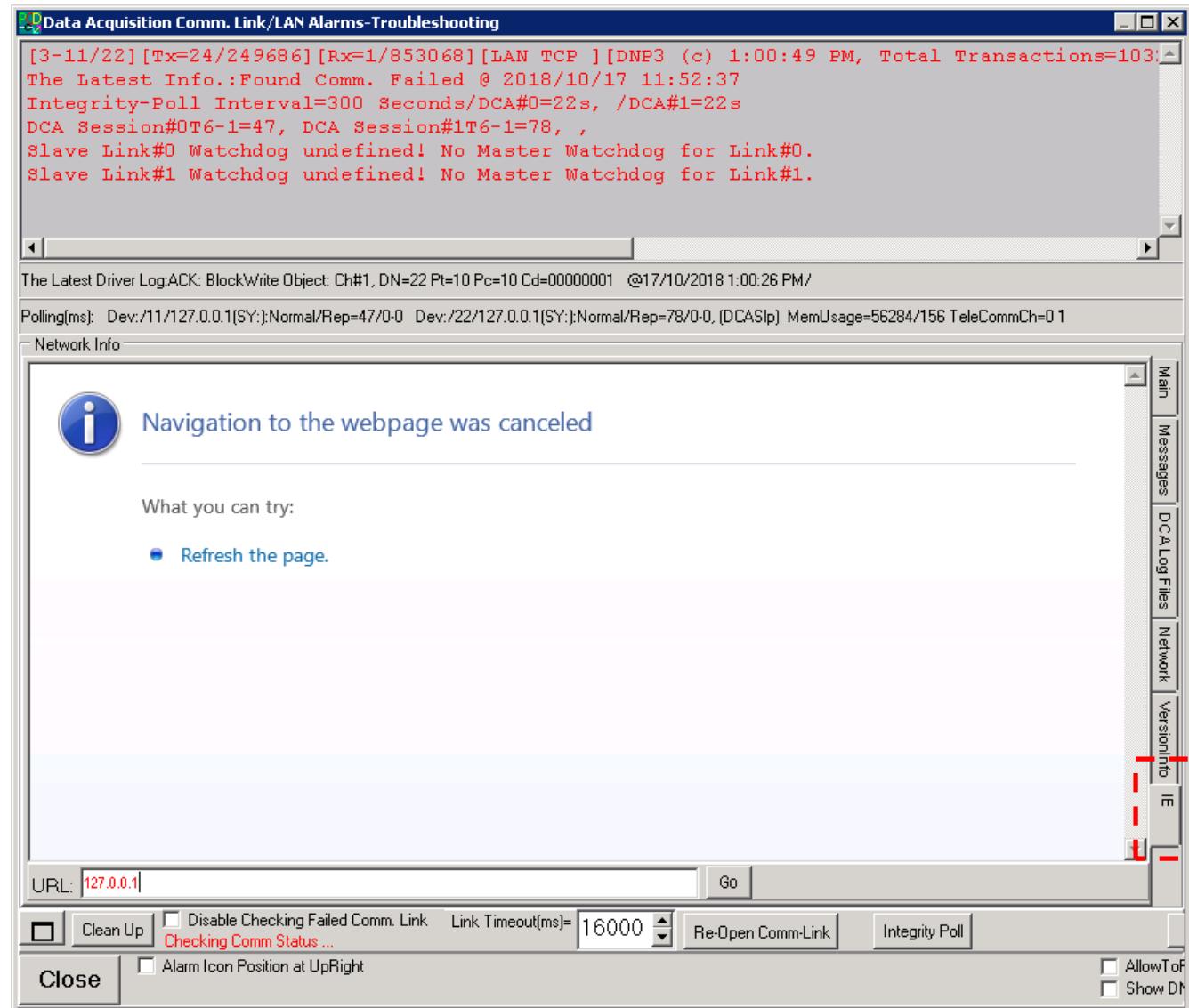
Or you can use Windows OS LAN connection to set/add an IP address.

DWORD=00

Set a static IP LAN Interface/Card Name: TCP IP Address: Subnet Mask: Gateway:
Add an IP Addr= LAB_LAN 10.1.2.21-51 255.255.255.0 Save LAN Cfg
Delete an IP Addr Refresh Info. Ping IP Addr. LAN Connection Scan ALL IP
Load LAN Cfg ... Window Firewall Close

33. To Open an embedded IE window directly

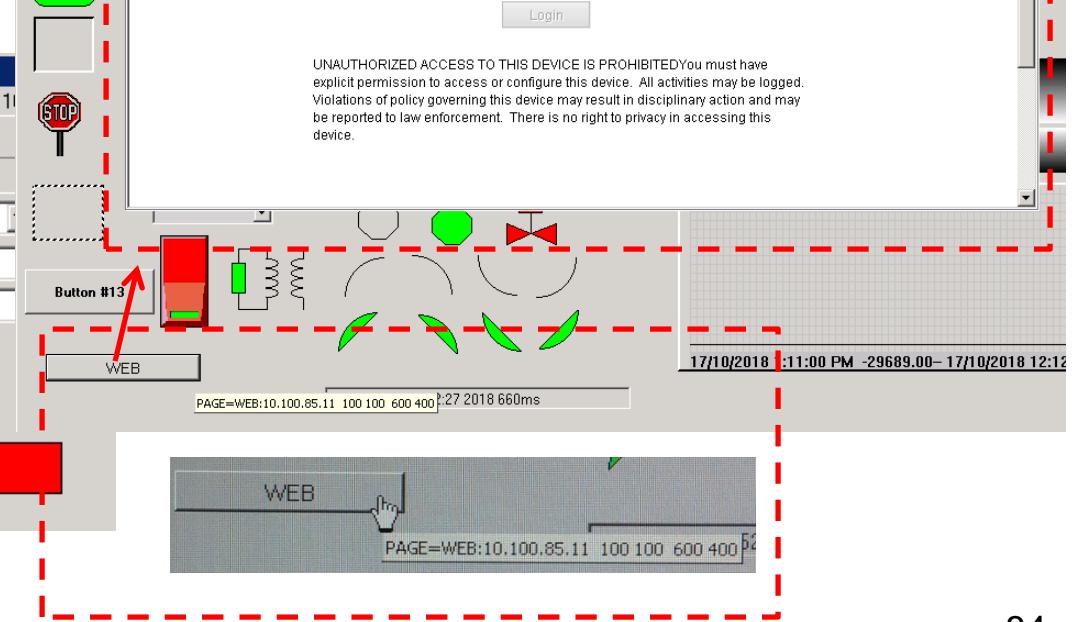
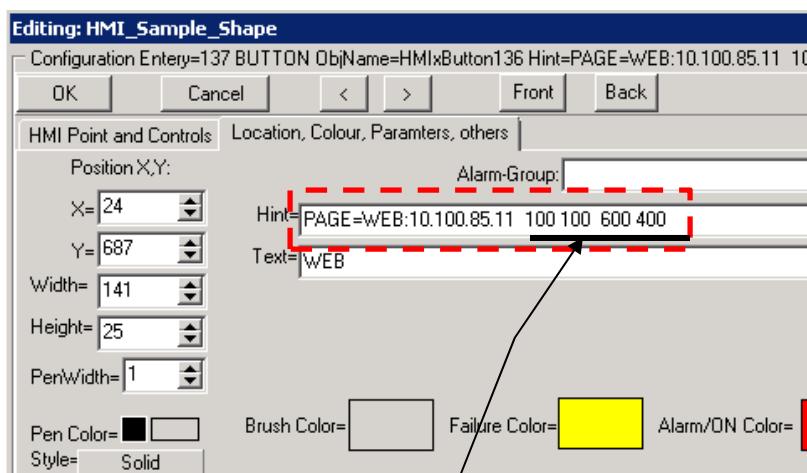
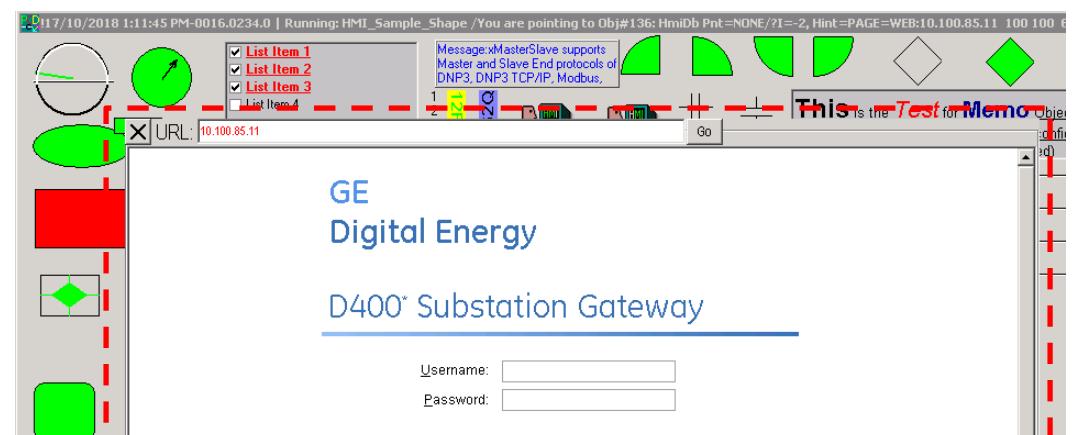
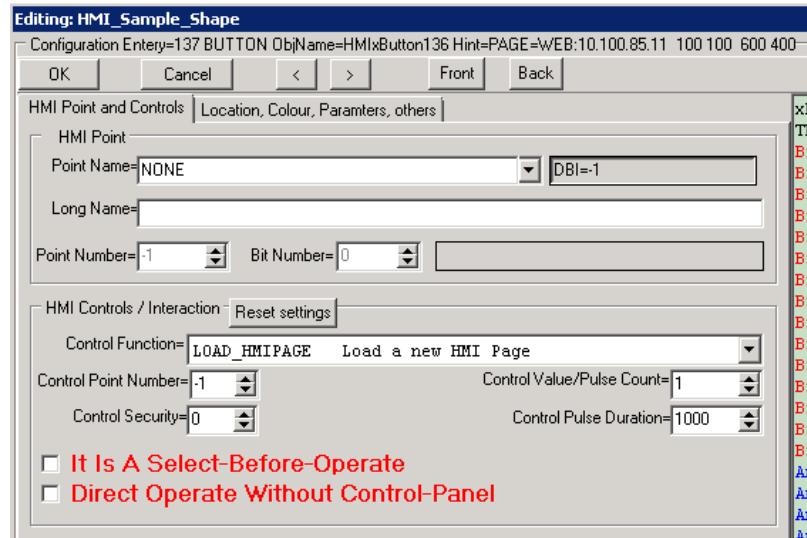
Open an embedded IE from Troubleshooting window directly



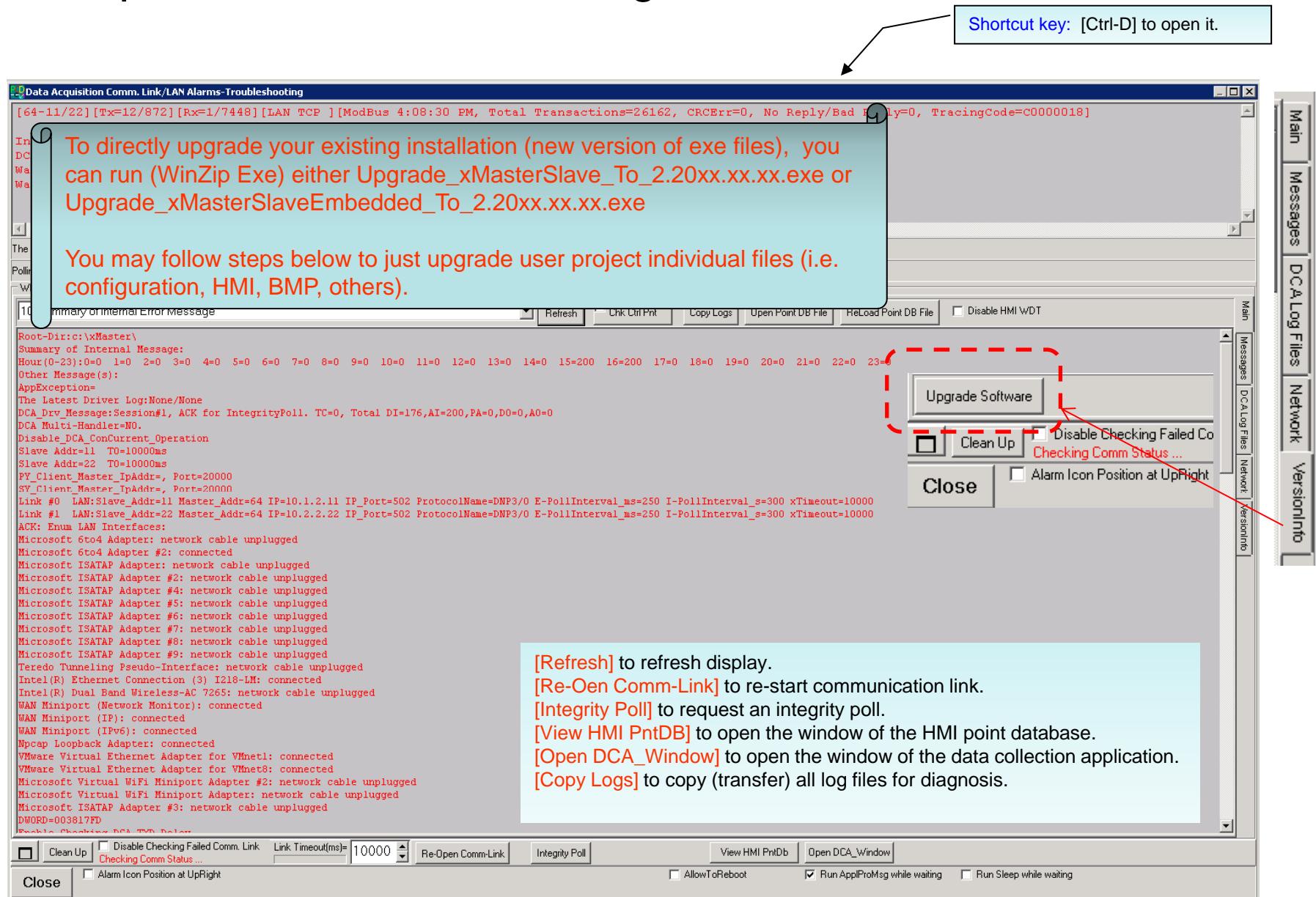
33. To Open an embedded IE Window directly

continue

Open an embedded IE from HMI display via a configuration



34. To Update software and configuration files



For details on how to use xMaster software, please refer to the manual:
xMaster_Manual.pdf.

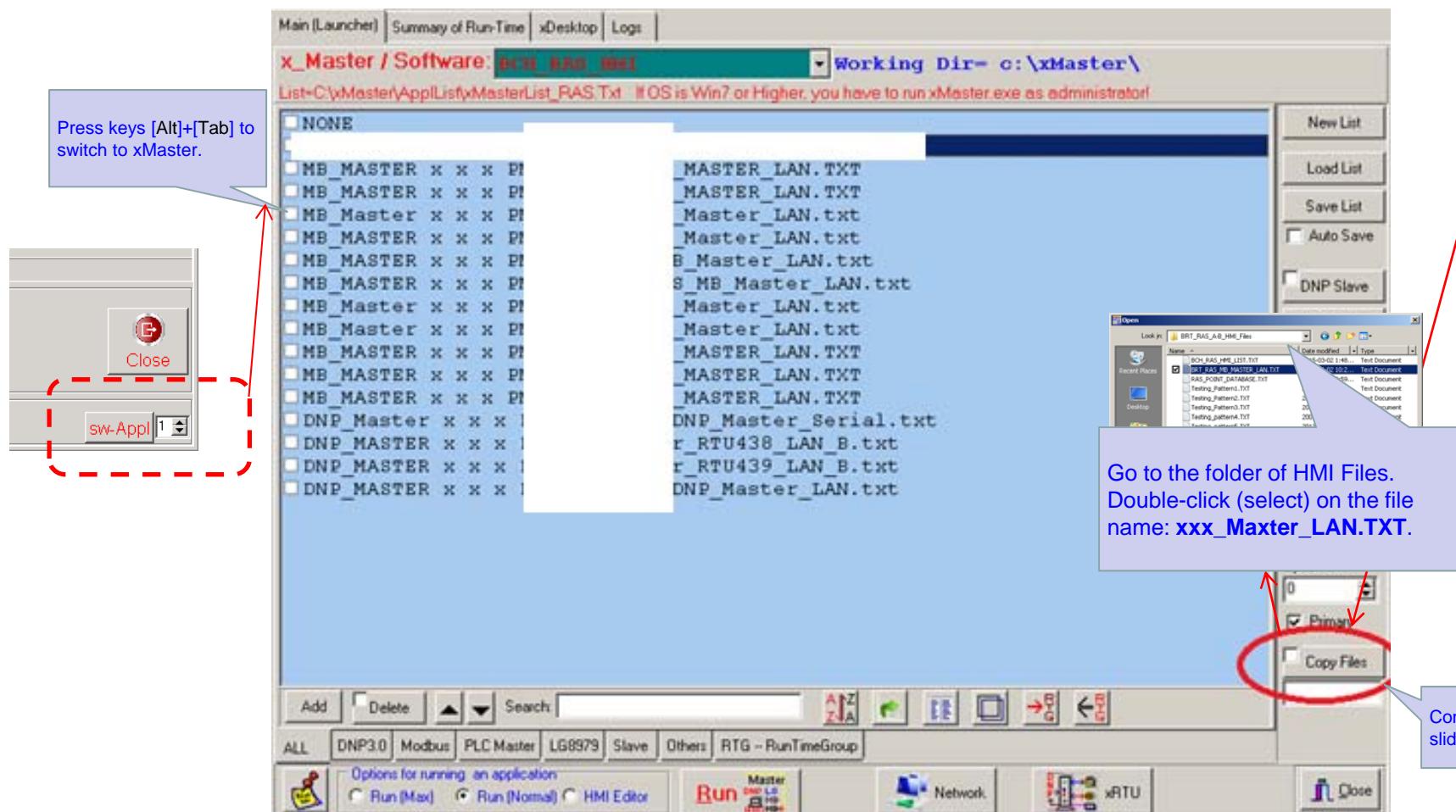
34. To Update software and configuration files

continue

To Install (copy) HMI software and HMI configurations

- 1 Call HMI Designer.
- 2 Copy the configuration and program from the CD via the window of xMaster (click on the button of **[Copy Files]** or go back to Microsoft Windows Desktop, copy file(s) directly into xMaster working folder, i.e. c:\xMaster, C:\xMaster\xMaster\Appl).
- 3 Reboot the HMI PC.

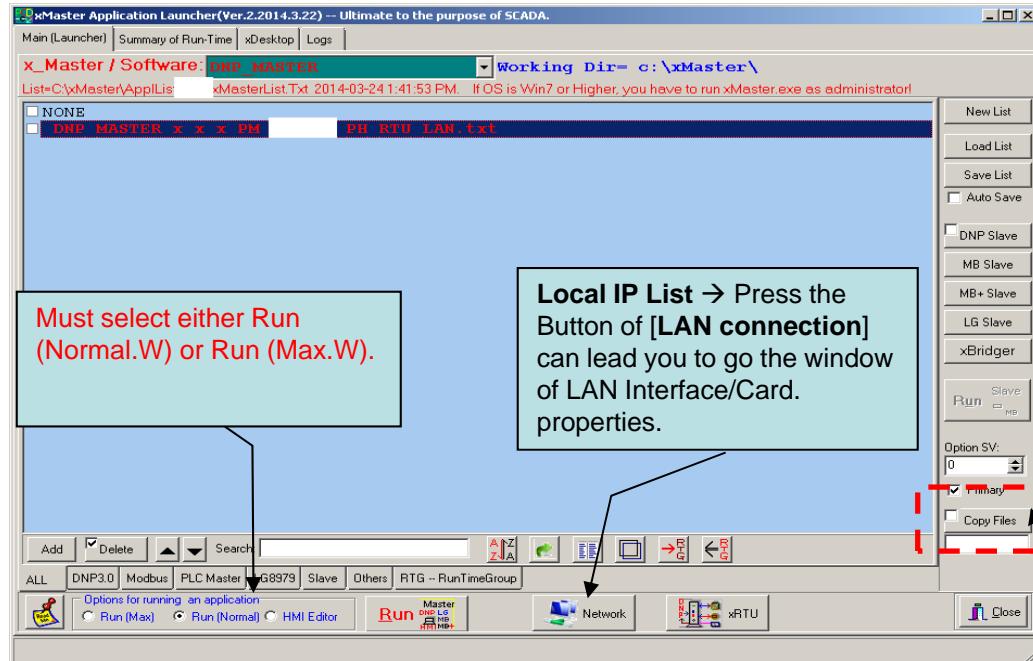
Or directly go to HMI troubleshooting window → [VersionInfo] → [Upgrade Software]. Refer to the previous slide



34. To Update software and configuration files

continue

- xMaster Application Launcher
- The working directory: c:\xMaster



Directly update HMI files: You can follow steps below to install and update the HMI files.

1. Download the attachment into an USB flash drive and Plug the USB drive into the HMI PC.
3. Get in the HMI screen and Press the key of Home if the Menu Bar is hidden.
4. Press the button of Menu on the Menu/Key Bar (normally placed on the right side of screen) to back to the main menu screen.
5. Press the button of Close (at Right Bottom corner) to close the current HMI Display application.
6. Close xMaster (HMI main - version after 2010, default password is xMaster to unlock Window Desktop) Application and back to Windows OS.
7. Backup the existing HMI files (i.e. Create a directory : c:\xMaster_2014AprilBackup and Copy all files and sub-folders from c:\xMaster into c:\xMaster_2014AprilBackup).
8. Copy HMI configuration files from the USB drive into c:\xMaster.
9. Run xMaster or Reboot HMI PC.

xMaster configurations are Text based files. It is very easy to archive its hardcopy and compatible to all version of xMaster.

Note: DO NOT change files in this list unless after the consultation with original designer. If you want to change Label/Title/Station Name/Tag Name, etc. please contact original designer to issue a new revision.

To copy(restore) / install xMaster file(s):
Press this button (navigate to the folder of *_HMI_Files and select the file of DNP_Master_* .TXT).

Or, Copy / Overwrite files into the directory of c:\xMaster for EXE files, c:\xMaster\xMasterApp\TXT for Text files, c:\xMaster\xMasterApp\HMI, etc.

The HMI PC may not have CD drive you have to use USB drive to copy and access files.

Tips:

Backup the existing all files / Sub-directories in the c:\xMaster before you copy/install the HMI.

If following files found existence, the HMI will not auto-run while the OS starts up.

c:\xMaster\Disable_xMaster.txt or
d:\xMaster\Disable_xMaster.txt (USB drive) or
e:\xMaster\Disable_xMaster.txt (USB drive) or
f:\xMaster\Disable_xMaster.txt (USB drive).

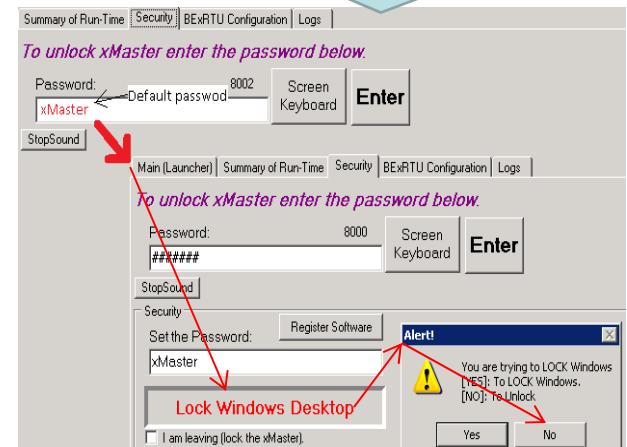
35. To Make a dedicated (solely) HMI UI from A Windows PC

Back to Window Desktop from HMI

- Windows Desktop is locked.
- To unlock the Windows desktop:
 - a. Press the button of [Security/Control] on the Main Menu Display, or
 - b. Press the button of [Lockout] on the Function Key-Bar (Press the key of [Home] to display the Key-Bar).
 - c. Click on the button of [Enable] on the Popup window afterwards.

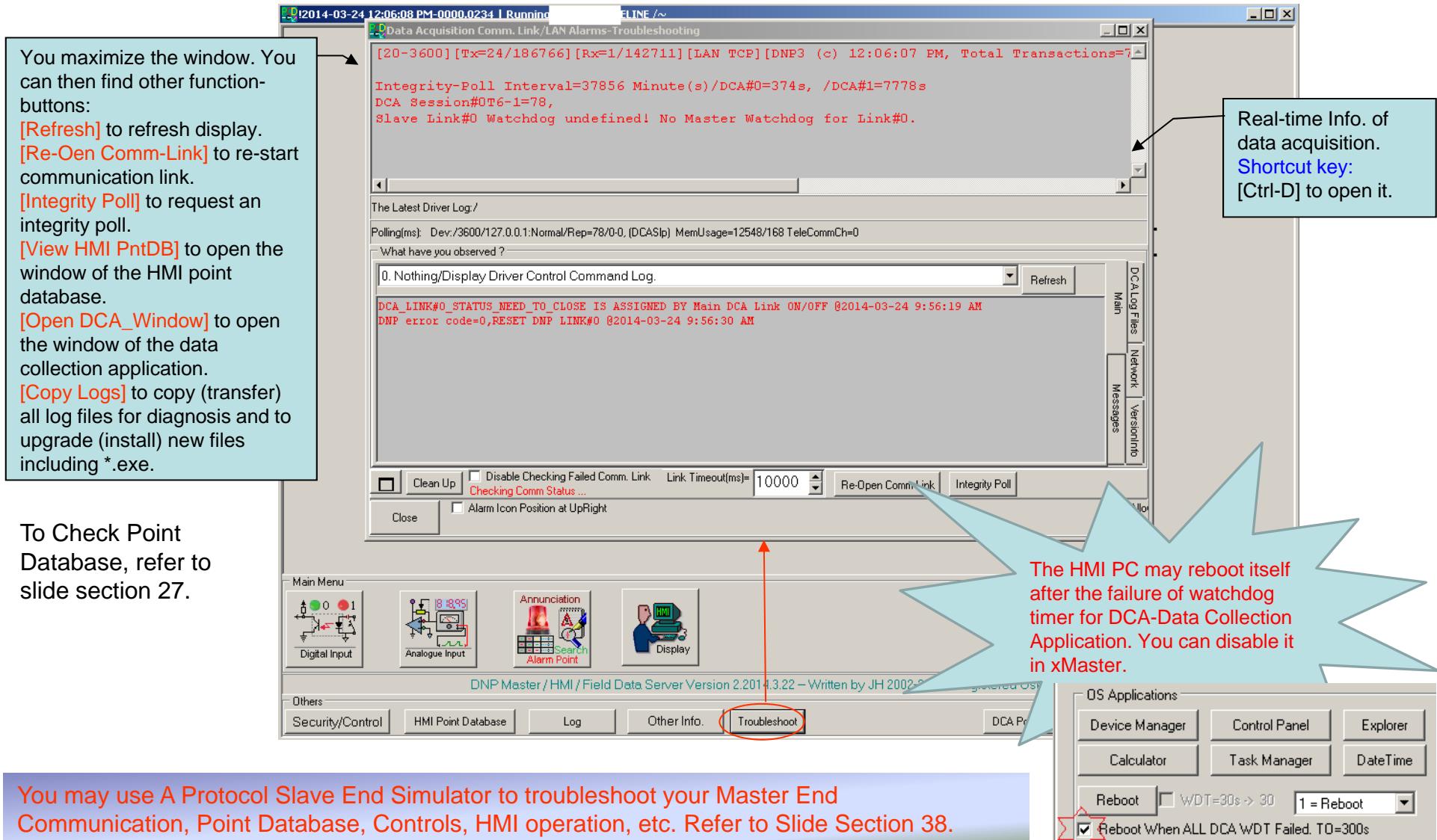
To unlock, exit and close
HMI screen/application the
default password is
xMaster

Press keys [Alt]+[Tab] to switch to xMaster
and enter the password to unlock
xMaster/Windows.



After unlock xMaster/Windows, this button will be shown up on the same Tab. You can press it to stop all HMI software and return to Windows Desktop (you can upgrade HMI software and update HMI files).

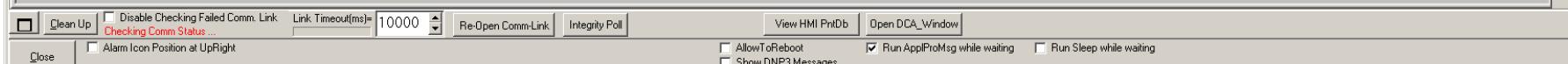
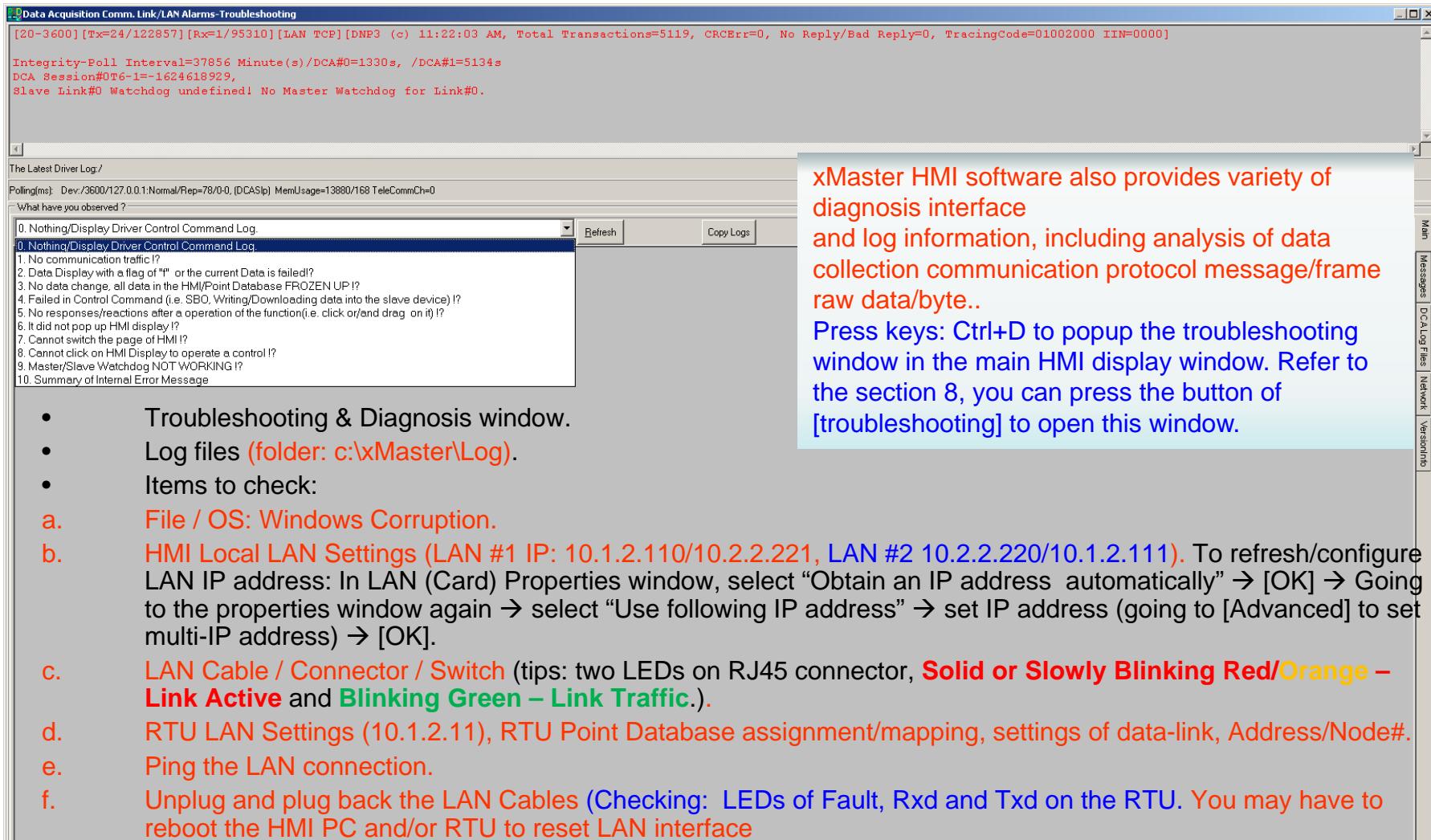
36. To Troubleshoot on communication and database



Line No.	Name	Line Status	Wdt.Addr=IN
RTG-1	RAS_MB_Master_LAN	ONLINE 0301	WDT=1432040, 11-0000-CONNECTED, 22-0000-CONNECTED,

36. To Troubleshoot on communication and database

continue



Check LAN/Network settings and its information, press these buttons (xMaster.exe). You also can Add/Delete an IP or consecutive IPs , change settings of Firewall, Ping/Scan IP, etc. Refer to Slide Section 32.



36. To Troubleshoot on communication and database

continue

HMI DCA Window

Data Collection Application (data acquisition driver). To open it press button or Shortcut key: [Alt-Ctrl-D].

The screenshot shows the Data Collection Application (DCA) window. At the top, there's a message about opening the application via a button or keyboard shortcut. Below this is a log window displaying numerous entries from April 9, 2018, at 09:48:35. The log includes messages like "Successful Login", "Device Address=11:Read SlaveWatchdog Point Address=150/OBJ#502.", and "Write MasterWatchdog Point Address=51/OBJ#1571.". To the right of the log is a table titled "Check Communication traffic Rx / Tx." with columns for IxC, Addr, Tx, Rx, Cx, and Ex. A callout box points to this table with the text "Check Communication traffic Rx / Tx.". At the bottom of the window, there are several filter and troubleshooting options, with a callout box pointing to the "Filter:" dropdown containing "Found Error".

IxC	Addr	Tx	Rx	Cx	Ex
0-0	11	38489/3848	2059/512110		Actv
1-1	22	38594/3859	1683/514230		Actv
2-2					
3-3					
4-4					
5-5					
6-6					
7-7					
8-8					
9-9					
10-10					
11-11					
12-12					
13-13					
14-14					
15-15					
16-16					
17-17					
18-18					
19-19					
20-20					
21-21					
22-22					
23-23					
24-24					
25-25					
26-26					
27-27					
28-28					
29-29					

You chose/filter what you want
see

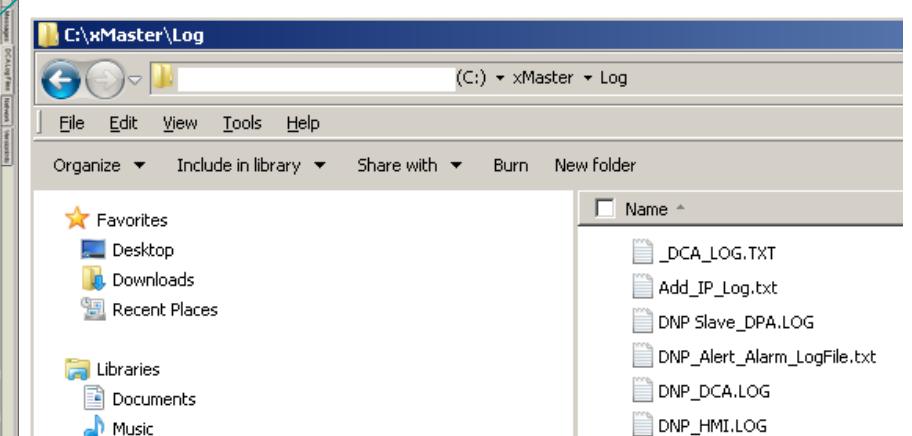
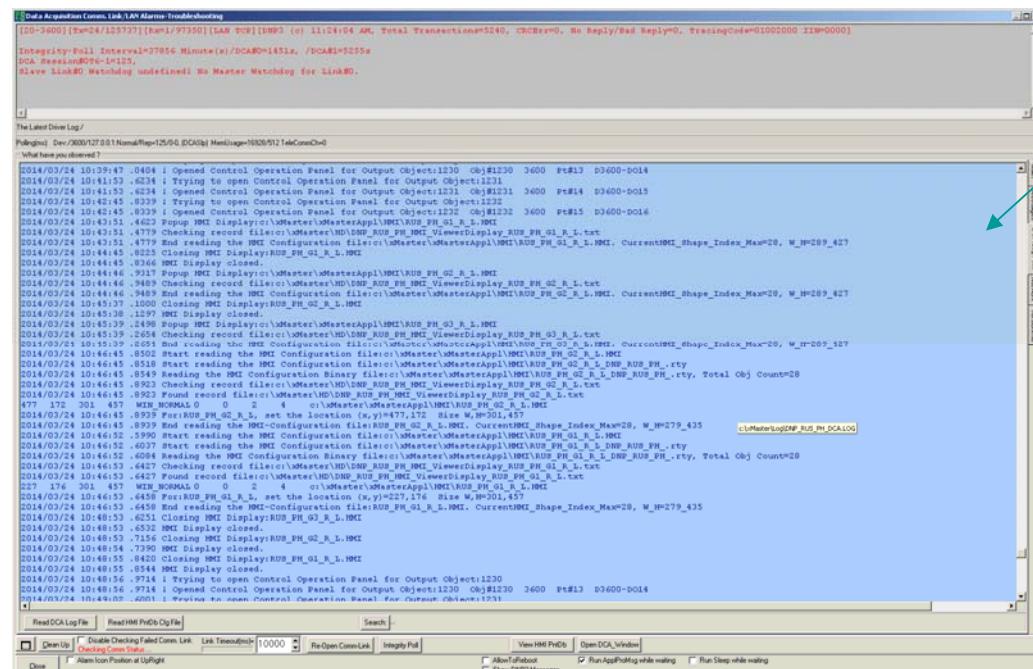
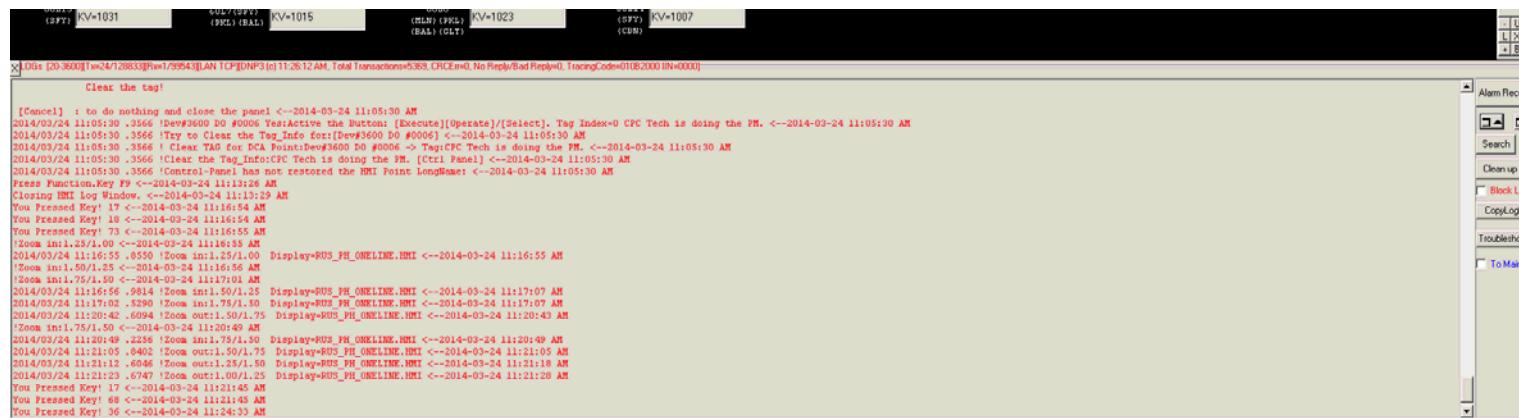
Block Display LogInfo Command Line[Type help to display the menu]: Integrity Poll Log DCA Index Filter: Found Error Troubleshoot

Clear Logs ReOpen Comm Link RxTx Log Enable Text String Enable DCA Logs Enable Logs of Writing DCA DB Suspended Data Acquisition

64-11/22 Tx=15/77071 Rx=12/684594 CAN TCP Modbus 10:01:33 AM, Total Transactions=12086, CRCErr=0, No Reply/bad Reply=0, TracingCode=C0000000

For details on how to use xMaster software, please refer to the manual:
xMaster_Manual.pdf.

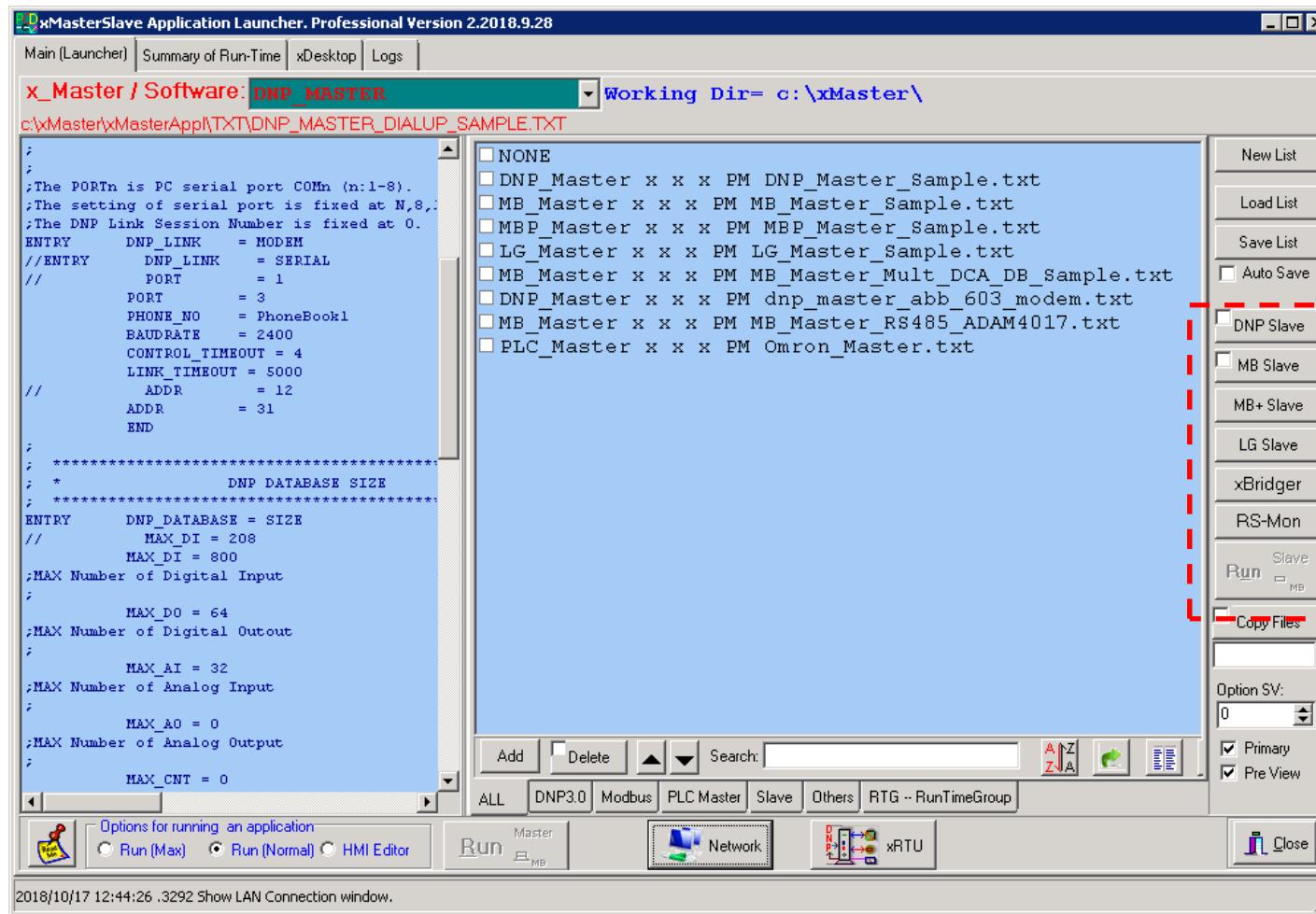
37. To Check Log Information



**Check files (Text based) in the folder:
C:\xMaster\Log**

38. To Simulate DNP3 and Modbus Devices (Point Database)

xMasterSlave also can be a Simulator of Slave (i.e. DNP3, Modbus, IEC60870-5, etc.). Slave simulator offers you Hand-free commissioning, Controls(DO&AO)-Details/Action/scripts, Auto/Manual Data Presenting, Log/Protocol Messages and Raw Rx/Tx bytes, TCP/IP (or UDP/IP) connections monitoring, RTU functioning(i.e. Control Enable/Disable, Point Online/Offline), etc. **Note: it supports up to 32 instances/slaves in a Master Application, supports up to 200 instances/Master-End-Connections in a DNP3 / Modbus slave application/simulator.**



38. To Simulate DNP3 and Modbus Devices (Point Database)

continue

Serial or Network/TCP or UDP connections of DNP3 / Modbus Slave End: RTU/PLC/IED

The screenshot shows the DNP Slave configuration interface. Key settings include:

- Protocol over Serial Port** (checked)
- Port**: COM1
- BaudRate**: 9600
- Data Bits**: 8
- Stop Bits**: 1
- Parity**: None
- Flow Control**: None
- CheckAddr=1** (unchecked)
- Protocol over Network** (unchecked)
- IP Port**: 20000
- Other Options**: Timeout=10000, TCP/IP, Auto-Abo, Sync AutoTest with Event-Poll, LocalForce Generates Events
- Identity**: Name: DNP Slave, Password: #####
- Slave Simulator Run-Time**: Slave: STOP, Monitor Messages from Master

A red arrow points from the "Protocol over Serial Port" checkbox to the "Inbound Rules" section of the Windows Firewall settings.

Setup the communication

For link over RS232:

- Step1: check [X] Protocol over Serial Port.
- Step2: select the comm port.
- Step3: setup comm port parameters to match with the existing communication link between the DNP Master and the Slave.

For link over LAN: (you may check settings in firewall)

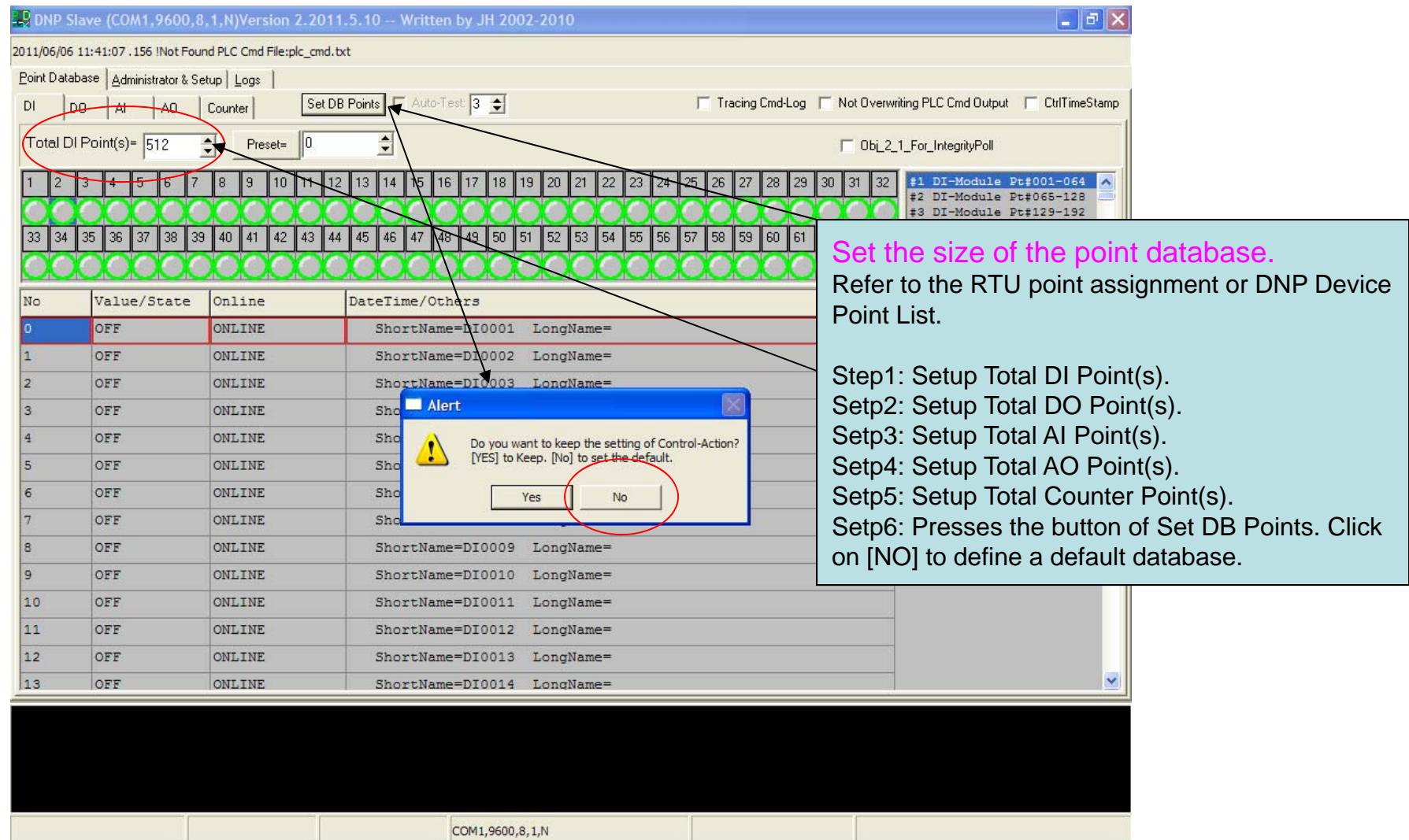
- Step1: check [X] Protocol over Network (TCP/IP).
- Step2: Setup the IP port. For DNP3, the port number usually is 20000.
- Step3: Setup your PC local LAN IP Address that can be recognized (reachable) by the DNP Master. If the DNP Master IP is 10.100.7.1, for example, your PC LAN IP address can be 10.100.7. 102 – the existing DNP Slave device IP address and must disconnect the existing LAN connection before the setting.

If want to response only for a specific slave address check it and define the current slave device address/node. It's for multi-drop link over serial (incl. modem) connection.

38. To Simulate DNP3 and Modbus Devices (Point Database)

continue

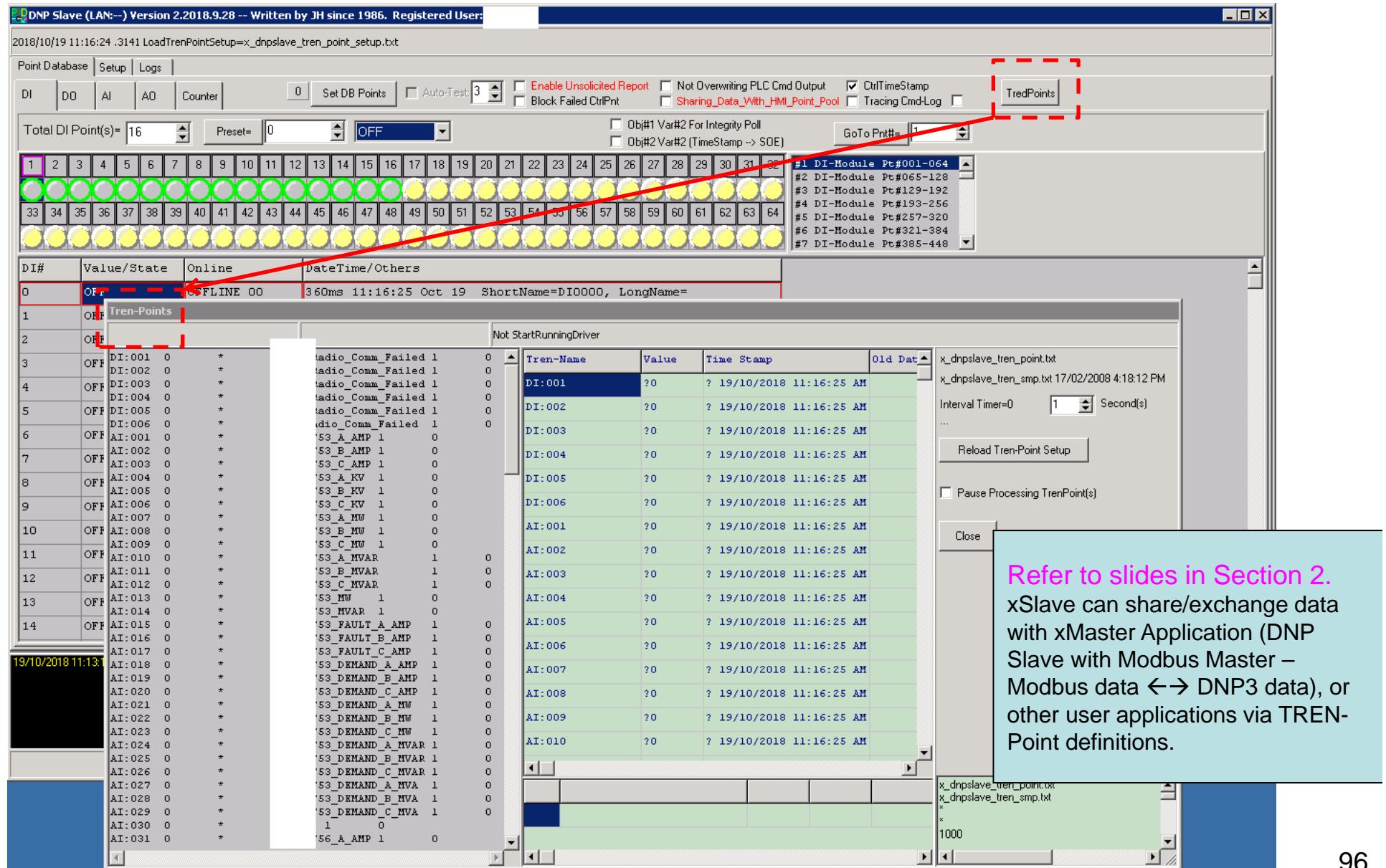
Setup Slave Local Point Database



38. To Simulate DNP3 and Modbus Devices (Point Database)

continue

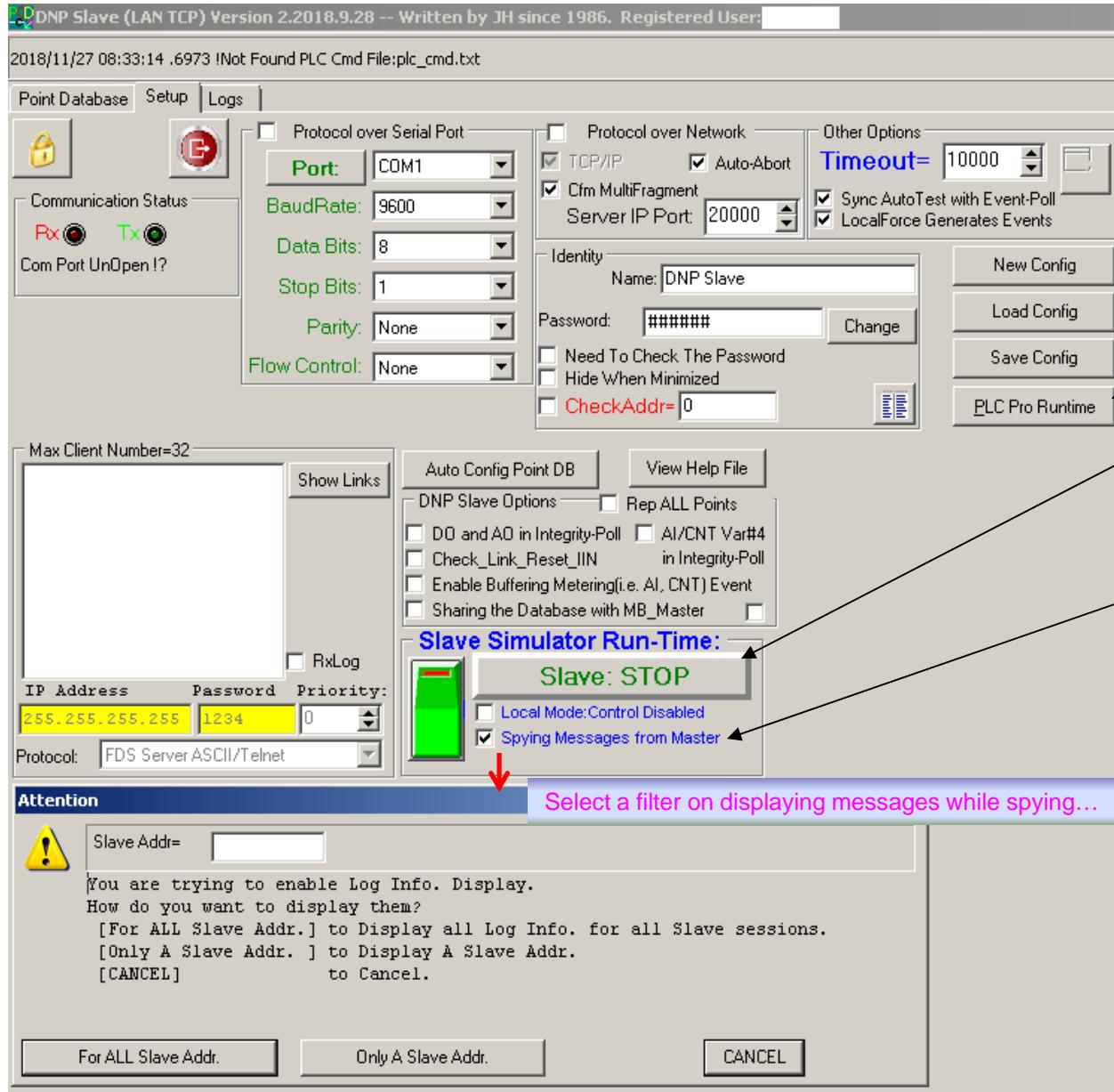
Setup Slave local Point Database for TREN-POINT (sharing data with other application)



38. To Simulate DNP3 and Modbus Devices (Point Database)

continue

Spying protocol message frame (polling and control command) from the Master End



You can Load/Save the configuration/Settings.

You can run a PLC program Runtime (to simulate PLC program to process data in xSlave local database)

Click on [Slave: STOP] (in green) to start the slave simulator Run-Time (changed to Slave: RUNNING in red).

If just want to monitor(spy) polling / control commands from the DNP Master End, check [X] Spying Messages from Master. Otherwise it fully simulates the DNP Slave device (Note: the cable should be 3-wire RS232 cable if over the serial port -- Refer to the next slide). This option is not for the Protocol Over Network. You may uncheck Enable Logging All Messages in the Tab of Log if you do not want to display all polling command (due to the Master End may poll every second).

38. To Simulate DNP3 and Modbus Devices (Point Database)

continue

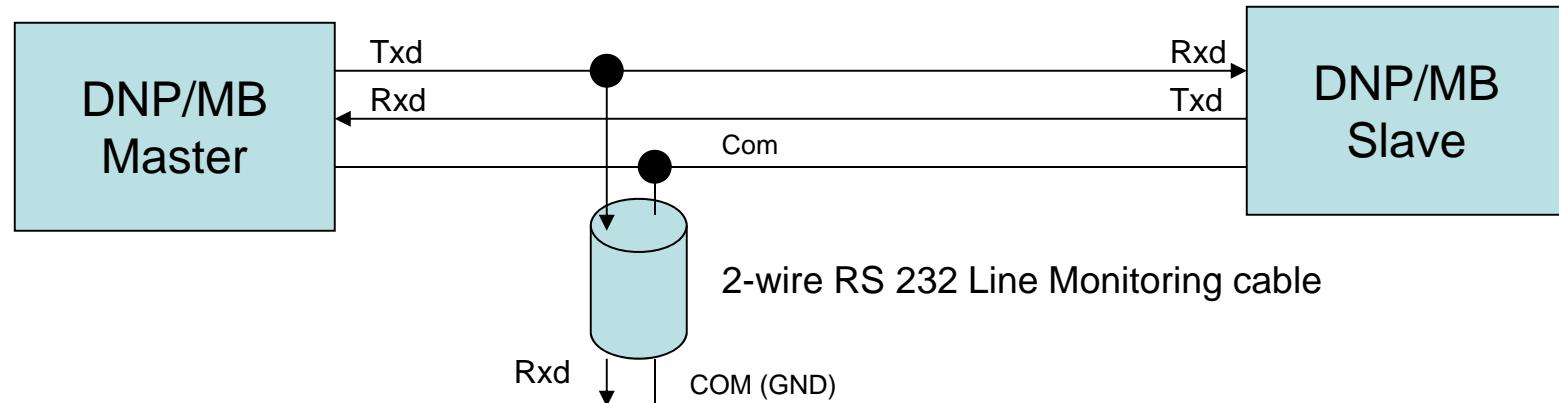
Spying protocol message frame (polling and control command) from the Master End -- continue

Spying/Monitoring polling and control commands from the SCADA Master End.

To check the polling and control command from Master (SCADA Master End , Main RTU, etc.) to Slave (RTU, PLC, IED, etc) over the serial port communication, you need a RS232 Line Monitoring cable.

Communication RS232 line connection diagram:

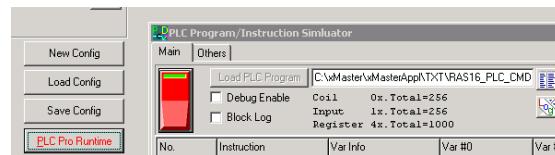
To check & verify data from DNP Master



Running A Protocol Slave End Simulator
to monitor polling and control commands from
the master end to the slave end.

38. To Simulate DNP3 and Modbus Devices (Point Database)

continue



You can run a PLC program Runtime (to simulate PLC program to process data in xSlave local database). Refer to Section 9 in the manual.

Simulating a PLC program to process Slave End point database

PLC Program/Instruction Simulator

Main | Others | **Load PLC Program** C:\xMaster\xMasterApp\TXT\RAS16_PLC_CMD

No. Instruction Var Info Var #0 Var #1

0000	90200.00 = 40248 == #2	F#=110, C#=0, IF=0, Ac	9x0200.00=0.00/00	4x0248=0.00/00000 #
0001	IF^ 90200.00 THEN CALL F#=94, C#=71, IF=0, Ac	9x0200.00=0.00/00	Label@0051=51.00/	
0002	IF^ 0065 THEN CALL R F#=94, C#=71, IF=0, Ac	0x0065=0.00/00000	Label@0055=55.00/	
0003	IF^ 0066 THEN CALL R F#=94, C#=71, IF=0, Ac	0x0066=0.00/00000	Label@0060=60.00/	
0004	IF^ 0067 THEN CALL R F#=94, C#=71, IF=0, Ac	0x0067=0.00/00000	Label@0065=65.00/	
0005	IF^ 0068 THEN CALL R F#=94, C#=71, IF=0, Ac	0x0068=0.00/00000	Label@0070=70.00/	
0006	IF^ 0069 THEN CALL R F#=94, C#=71, IF=0, Ac	0x0069=0.00/00000	Label@0075=75.00/	
0007	IF^ 0070 THEN CALL R F#=94, C#=71, IF=0, Ac	0x0070=0.00/00000	Label@0080=80.00/	
0008	IF^ 0071 THEN CALL R F#=94, C#=71, IF=0, Ac	0x0071=0.00/00000	Label@0085=85.00/	
0009	IF^ 0072 THEN CALL R F#=94, C#=71, IF=0, Ac	0x0072=0.00/00000	Label@0090=90.00/	
0010	IF^ 0073 THEN CALL R F#=94, C#=71, IF=0, Ac	0x0073=0.00/00000	Label@0095=95.00/	
0011	IF^ 0074 THEN CALL R F#=94, C#=71, IF=0, Ac	0x0074=0.00/00000	Label@0100=100.00/	
0012	IF^ 0075 THEN CALL R F#=94, C#=71, IF=0, Ac	0x0075=0.00/00000	Label@0105=105.00/	
0013	IF^ 0076 THEN CALL R F#=94, C#=71, IF=0, Ac	0x0076=0.00/00000	Label@0110=110.00/	
0014	IF^ 0077 THEN CALL R F#=94, C#=71, IF=0, Ac	0x0077=0.00/00000	Label@0115=115.00/	
0015	IF^ 0078 THEN CALL R F#=94, C#=71, IF=0, Ac	0x0078=0.00/00000	Label@0120=120.00/	

x0_Total=256
x0_Offset=1

Step is done at: 0 PLC RunTime Interval= 100 15/06/2018 3:49:56 PM WDC
 Process A Cycle Only Update IO Database for each PLC Cmd Line

RAS16_PLC_CMD.txt - Notepad

```

;PLC ladder logic language program run
;Define the size of database
DB_SIZE_0X= 256
FIRST_0X_NO.= 1
DB_SIZE_1X= 256
FIRST_1X_NO.= 1
DB_SIZE_4X= 1000
FIRST_4X_NO.= 1

;0200.00 = 40248 == #21808
IF^ 90200.00 THEN CALL RTU_MATRIX_TE40
IF^ 0065 THEN CALL RTU_MATRIX_TE41
IF^ 0066 THEN CALL RTU_MATRIX_TE42
IF^ 0067 THEN CALL RTU_MATRIX_TE43
IF^ 0068 THEN CALL RTU_MATRIX_TE44
IF^ 0069 THEN CALL RTU_MATRIX_TE45
IF^ 0070 THEN CALL RTU_MATRIX_TE46
IF^ 0071 THEN CALL RTU_MATRIX_TE47
IF^ 0072 THEN CALL RTU_MATRIX_TE48
;
END

!RCV_HMI_MATRIX
40248 = #0
40110 = COPY 40200 #48
RET

!RTU_MATRIX_TE01
0065 = #0
40110 = COPY 40104 #1
40105 = #01
RET

!RTU_MATRIX_TE02
0066 = #0
40111 = COPY 40104 #1
40105 = #02
RET

!RTU_MATRIX_TE03
0067 = #0
40112 = COPY 40104 #1
40105 = #03
RET

!RTU_MATRIX_TE04
0068 = #0
40113 = COPY 40104 #1
40105 = #04
RET

!RTU_MATRIX_TE05
0069 = #0
40114 = COPY 40104 #1
40105 = #05
RET

!RTU_MATRIX_TE06
0070 = #0
40115 = COPY 40104 #1
40105 = #06
RET
;
```

38. To Simulate DNP3 and Modbus Devices (Point Database)

continue

Setup and check Log information

The screenshot shows the DNP Slave (LAN:10.101.7.21--10.101.7.21) Version 2.2011.6.1 software interface. The main window displays a log of communication messages. A pink arrow points from the text "You can check [X] Enable Logging All Messages to display all communication & protocol activities." to the "Enable Logging All Messages" checkbox at the bottom of the log window. Another pink arrow points from the text "You can check [X] RxTx Log Enable only to display the RAW protocol frames/bytes." to the "RxTx Log Enable" checkbox. A third pink arrow points from the text "You can check [X] Block Display Loginfo to block logging." to the "Block Display Loginfo" checkbox. The log window shows various DNP protocol messages, including SELECT, OPERATE, and CLOSE commands, along with their responses. At the bottom, there is a summary of the session: Slave=18000, Master=20, Rx=33131, Tx=26004, and LAN:10.101.7.21--10.101.7.21.

You can check the log information in the tab of Logs.

You can check [X] Enable Logging All Messages to display all communication & protocol activities.

You can check [X] RxTx Log Enable only to display the RAW protocol frames/bytes.

You can check [X] Block Display Loginfo to block logging.

The log-display area at the bottom is to display the control commands from DNP master end in the format of DNP protocol Message.

You can find the DNP Address, Communication Rx/TX, Port, etc.

38. To Simulate DNP3 and Modbus Devices (Point Database)

continue

Check Digital Output control setting and Setup Control-Action

DNP Slave (LAN:10.101.7.21--10.101.7.21) Version 2.2011.6.1 -- Written by JH 2002-2010
2011/06/06 15:16:06 .453 00000074-0023175453 00>0014->4650 End of Integrity_Poll_Progress. Total Frame=3

Point Database | Administrator & Setup | Logs |

DI DO AI AO Counter | Set DB Points | Auto-Test: 3 | Enable Unsolicited Report | Tracing Cmd-Log | Not Overwriting PLC Cmd Output | CtrlTimeStamp | Sharing_Data_With_HMI_Point

Total DO Point(s): 64 | Reset | Disable Control Actions | Save DO Action | Load DO Action | HelpOnAction

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64

#1 DO-Module Pt#001-032
#2 DO-Module Pt#033-064
#3 DO-Module Pt#065-096
#4 DO-Module Pt#097-128
#5 DO-Module Pt#129-160
#6 DO-Module Pt#161-192
#7 DO-Module Pt#193-224
#8 DO-Module Pt#225-256

No	Value/State	Online	ControlCode	Count	OnTime	OffTime	Action	DateTime/Others
0	OFF	ONLINE	NONE	0-0	0	0	DIO000=ON	ShortName=D00001
1	OFF	ONLINE	NONE	0-0	0	0	DIO001=ON	ShortName=D00002
2	OFF	ONLINE	41: SBO CLOSE	1-0	1000	0	DIO002=ON	15:15:35 Jun 06 ShortName=D00003
3	OFF	ONLINE	NONE	0-0	0	0	DIO003=ON	ShortName=D00004
4	OFF	ONLINE	NONE	0-0	0	0	DIO004=ON	ShortName=D00005
5	OFF	ONLINE	NONE	0-0	0	0	DIO005=ON	ShortName=D00006
6	OFF	ONLINE	NONE	0-0	0	0	DIO006=ON	ShortName=D00007
7	OFF	ONLINE	NONE	0-0	0	0	DIO007=ON	ShortName=D00008
8	OFF	ONLINE	NONE	0-0	0	0	DIO008=ON	ShortName=D00009
9	OFF	ONLINE	NONE	0-0	0	0	DIO009=ON	ShortName=D00010
10	OFF	ONLINE	NONE	0-0	0	0	DIO010=ON	ShortName=D00011
11	OFF	ONLINE	NONE	0-0	0	0	DIO011=ON	ShortName=D00012
12	OFF	ONLINE	NONE	0-0	0	0	DIO012=ON	ShortName=D00013
13	OFF	ONLINE	NONE	0-0	0	0	DIO013=ON	ShortName=D00014

You can go to the tab of DO to monitor the control command in the DO point database. You can find the Control Code, Count, OnTime and Offtime.

Similarly you can go to the tab of AO to monitor the AO command (the AO Setpoint).

Data is not shown if running under the mode of SPYING messages from the Master End.

2011/06/06 15:15:46 328 328 >00:0014->4650 <Response: Obj#12, Var#01, Q#047, Qty=1, Code=81: SBO OPEN, Cnt=01, ON-T=001000, OFF-T=000000, Flag=00>Success
2011/06/06 15:15:46 328 328 >00:0014->4650 Request:OPERATE Obj#12,Var#1, Q#40, Id/Pn#=047, Qty=1, Code=81: SBO OPEN, Cnt=01, ON-T=001000, OFF-T=000000
2011/06/06 15:15:46 281 281 >00:0014->4650 <Response: Obj#12, Var#01, Q#28, Id/Pn#=047, Qty=1, Code=81: SBO OPEN, Cnt=01, ON-T=001000, OFF-T=000000
2011/06/06 15:15:46 281 281 >00:0014->4650 Request:SELECT Obj#12,Var#1, Q#40, Id/Pn#=047, Qty=1, Code=81: SBO OPEN, Count=1, ON-T=001000, OFF-T=000000
2011/06/06 15:15:43 671 671 >00:0014->4650 <Response: Obj#12, Var#01, Q#28, Id/Pn#=047, Qty=1, Code=81: SBO CLOSE, Cnt=01, ON-T=001000, OFF-T=000000, Flag=00>Success
2011/06/06 15:15:43 671 671 >00:0014->4650 Request:OPERATE Obj#12,Var#1, Q#40, Id/Pn#=047, Qty=1, Code=41: SBO CLOSE, Count=1, ON-T=001000, OFF-T=000000
2011/06/06 15:15:42 625 625 >00:0014->4650 <Response: Obj#12, Var#01, Q#28, Id/Pn#=047, Qty=1, Code=41: SBO CLOSE, Cnt=01, ON-T=001000, OFF-T=000000, Flag=00>Success
2011/06/06 15:15:42 625 625 >00:0014->4650 Request:SELECT Obj#12, Var#1, Q#40, Id/Pn#=047, Qty=1, Code=41: SBO CLOSE, Cnt=01, ON-T=001000, OFF-T=000000

38. To Simulate DNP3 and Modbus Devices (Point Database)

continue

Auto Test / Hand-free commissioning

The screenshot shows the DNP Slave (COM1,9600,8,1,N) Version 2.2011.5.10 software interface. The Point Database tab is selected. At the top, there are tabs for Point Database, Administrator & Setup, Logs, Set DB Points, Auto-Test (with a dropdown menu), Tracing CmdLog, Not Overwriting PLC Cmd Out, and Obj_2_1_For_IntegrityPol. Below the tabs, there are buttons for DI, DO, AI, AO, Counter, Set DB Points, Auto-Test, Tracing CmdLog, Not Overwriting PLC Cmd Out, and Obj_2_1_For_IntegrityPol. A status message at the top left says "2011/06/06 12:58:02 .921 Start the multi-thread of User DAS Slave-Application. Wait for polling from the Master End ...". The main area displays a grid of 64 DI points. The first 16 points (1-16) are highlighted in green, indicating they are online. Points 17-64 are greyed out. A dropdown menu under the DI button shows "Preset= 0 OFF". Below the grid is a table with columns: No, Value/State, Online, and DateTime/Others. The table lists points 0 through 17. Point 9 is currently selected, showing "OFF" in the Value/State column and "ONLINE" in the Online column. An "Attention" dialog box at the bottom left provides instructions for performing a Data/Value auto-test.

If want to be **hand-free testing**, you can check [X] Auto Test. The interval of changing the state of DI points must at least TWO times of the master end polling. It is usually 4 seconds. Once it is checked, the software will automatically and continually toggle the state of all DI points one by one starting from the point you select.

If fully simulate the DNP slave device, you can **simulate the data of DI**. You can select the current DI point and double click on the DI-LED to toggle the state of DI point.
Note: the point number is starting from 0 at the point database, from 1 at the DI-LED area.

Also you can change the ONLINE/OFFLINE for the current point by clicking on the Online then change it from drop list box

Attention

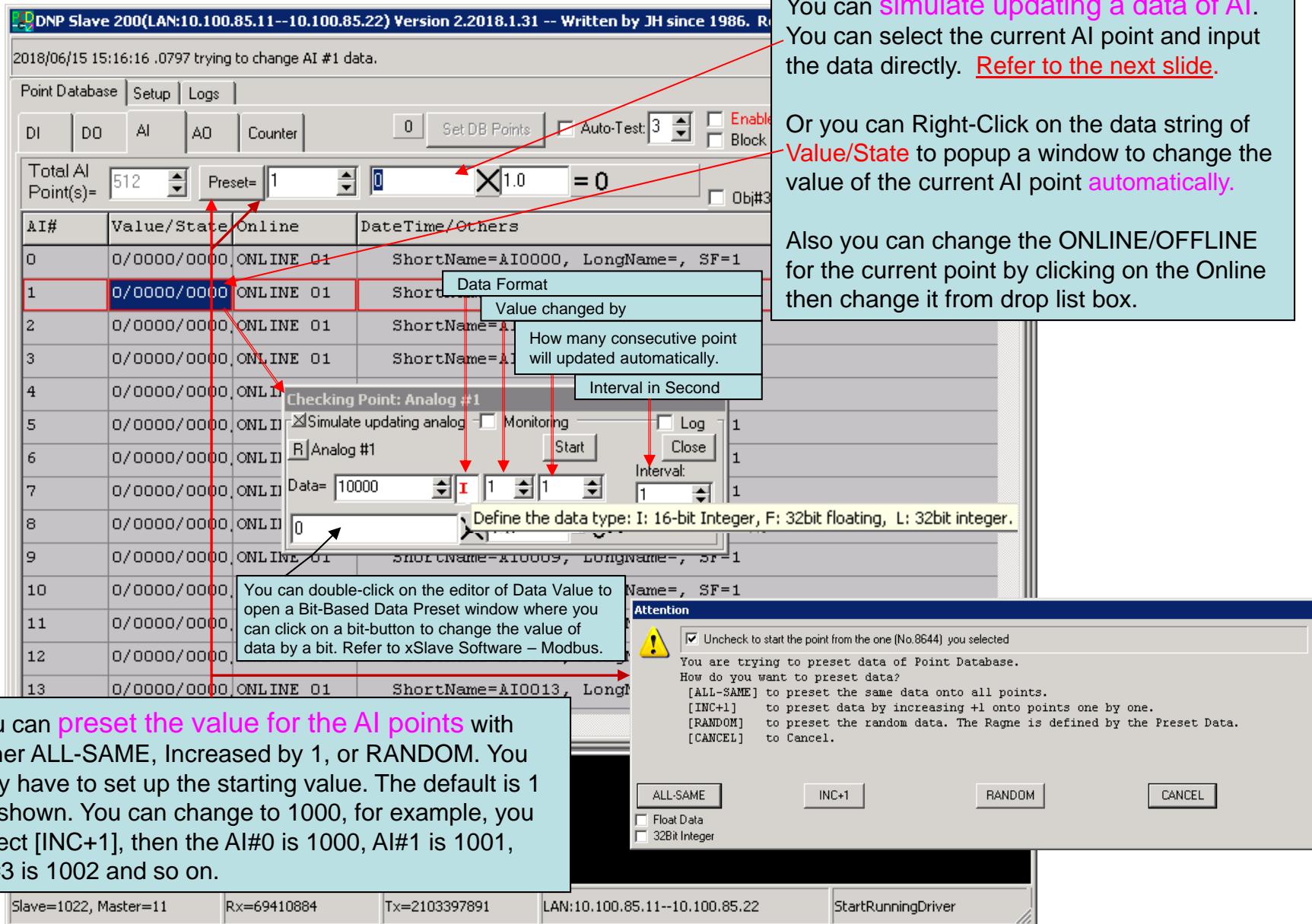
You are trying to do Data/Value auto-test.
How do you want to operate?
[4-Value] to preset up to 4 value.
[8BitHex] to preset 0x01,0x02,0x04,0x08,0x10,0x20,0x40,0x80.
[16BitHex] to preset 0x0001,0x0002,...0x4000,0x8000.
[CANCEL] to Cancel.

4-Value 8BitHex 16BitHex CANCEL

38. To Simulate DNP3 and Modbus Devices (Point Database)

continue

Analog Value Preset/Data-Animation



38. To Simulate DNP3 and Modbus Devices (Point Database)

continue

DNP3 32Bit Data -- Integer or Floating point (Real)

AI#	Value/State	Online	DateTime/Others
0	1234567/001	ONLINE 03	32Bit data 08:08:44 Oct 26 ShortName=AI0000, LongName=, SF=1

38. To Simulate DNP3 and Modbus Devices (Point Database)

continue

Modbus 32Bit Data -- Integer or Floating point (Real)

MB Slave (LAN TCP) Version 2.2018.9.28 -- Written by JH since 1986. Registered User:

4x1, Input Long-Int=1234567

Point Database | Setup | Logs

DI 1xxx DO 0xxxx Reg 4xxxx Reg 3xxxx 0 Set DB Points Auto-Test: 3 Enable Unsolicited Report Not Overwriting PLC Cmd Output CtrlTimeStamp
Block Failed CtrlPnt Sharing_Data_With_HMI_Point_Pool Tracing Cmd-Log

Total AI Point(s)= 5000 Preset= 1 1234567L X1.0 = 1234567 MB 4x Start 1 Watchdog -1 3 GoTo Pnt#= 1 Modbus 32Bit Data
Address= Point#= 1 Decode SIP Cmd

4x	Value/State	Online	DateTime/Others
1	54919/0000D	ONLINE 03	32Bit data 08:14:57 Oct 26 ShortName=AI0000, LongName=, SF=1
2	18/0012/000	ONLINE 03	08:14:57 Oct 26 ShortName=AI0001, LongName=, SF=1

DI 1xxx DO 0xxxx Reg 4xxxx Reg 3xxxx 0 Set DB Points Auto-Test: 3 Enable Unsolicited Report Not Overwriting PLC Cmd Output CtrlTimeStamp
Block Failed CtrlPnt Sharing_Data_With_HMI_Point_Pool Tracing Cmd-Log

Total AI Point(s)= 5000 Preset= 1 0 X1.0 = 0 MB 4x Start 1 Watchdog -1 3 GoTo Pnt#= 1 Modbus 32Bit Data
Address= Point#= 1 Decode SIP Cmd

If Checked, Modbus 32bit data (you preset) formed by Byte3-4-1-2 (i.e. PLC 1st Reg is Lo16, 2nd Reg is Hi16). Otherwise Byte1-2-3-4 (i.e. PML Meter 1st Reg is Hi16, 2nd Reg is Lo16)

4x	Value/State	Online	DateTime/Others
1	18/00000012/0000,0000,0000,0000,0000,0001,0010	ONLINE 03	32Bit data 08:16:29 Oct 26 ShortName=AI0000, LongName=, SF=1
2	-10617/D687/1101,0110,1000,0111	ONLINE 03	08:16:29 Oct 26 ShortName=AI0001, LongName=, SF=1

Total AI Point(s)= 5000 Preset= 1 1234.567F X1.0 = 1234.567 MB 4x Start 1 Watchdog -1 3 GoTo Pnt#= 1 Modbus 32Bit Data
Address= Point#= 1 Decode SIP Cmd

4x	Value/State	Online	DateTime/Others
r. 1	21029/5225/0101,0010,0010,0101	ONLINE 03	Floating data 08:22:16 Oct 26 ShortName=AI0000, LongName=r. ,
2	17562/449A/0100,0100,1001,1010	ONLINE 03	08:22:16 Oct 26 ShortName=AI0001, LongName=, SF=1

105

For DNP 32bit data refer to the previous slide.

38. To Simulate DNP3 and Modbus Devices (Point Database)

continue

Data Format: I, B, L, F
Value changed by (1) every time
How many consecutive point will updated automatically.

Checking Point: 4x08644
Simulate updating analog Monitoring Log
R 4x08644
Data= 10000 I 1 1 Interval: 1
0 X 1.0 = 0

Analog Value Preset/Data-Animation

[I] for a16-bit AI/Register data.
You can change the window to a Bit-based window below by a double-click on [0_1](an area of data monitoring)

Checking Point: Status Points: 4x08116
15 14 13 12 11 10 09 08 07 06 05 04 03 02 01 00
R Reset 0000 Set X
0 X 1.0 =

Digital Input points are preset by a **16-bit AI/Register** data.
Toggle a button of [00] to [15] to set/reset the bit. The data will be updated when you press the button of [Set].
[15] is set a value of 1000-0000-0000-0000
[00] is set a value of 0000-0000-0000-0001
Setting Multi-Bit is allowed.

Checking Point: Alarm Points: 4x08101
Simulate updating analog Monitoring Log
R Alarm Points: 4x08101 Start Close
Data= 0 B 1 10 Interval: 4
0 X 1.0 =

A **16-bit AI/Register** data is formatted as **Binary** data.
The data will be updated (a binary bit shifting to the left) from 0000-0000-0000-0001 to 1000-0000-0000-0000.

Checking Point: Metering Points: 4x08213
Simulate updating analog Monitoring Log
R 4x08213 Stop Close
Data= 635 L 1 64 Interval:(35)
0 X 1.0 =

[L] for a16-bit AI/Register data.

[R] to register/save the current window. You load them when you start running xSlave.

[Interval] to set the interval (in second) to update the value.

If the database /mapping table is changed, you have to close these window and re-open it.

38. To Simulate DNP3 and Modbus Devices (Point Database)

continue

Listing connections between Slave End and Master End

The screenshot shows the DNP Slave software interface. At the top, it displays the title 'DNP Slave (LAN:10.100.31.247--10.100.31.21) Version 2.2011.1.10 -- Written by JH 2002-2010' and a timestamp '2011/06/06 13:58:16 .172 0017B501-0276913172 04>0001->0066 End of Integrity_Poll_Progress. Total Frame=5'. Below this is a navigation bar with tabs: 'Point Database' (selected), 'Administrator & Setup', and 'Logs'. A 'Clients' section is shown with a table:

No.	Address	IP Address	IP Port	Messages	Slave IP	Others
1	Master#=1, Slave#=1201	10.100.31.247	3796	RxTotal(Bytes)=27067779, TxTotal(Bytes)=25338401, EP=1859, IF 10.100.31.21	Database: DI=512, DO=128, AI=160, AO=32, CNT=64	
2	Master#=1, Slave#=1202	10.100.31.247	3797	RxTotal(Bytes)=27067106, TxTotal(Bytes)=25336726, EP=1750, IF 10.100.31.22	Database: DI=512, DO=128, AI=160, AO=32, CNT=64	
3	Master#=1, Slave#=1203	10.100.31.247	3798	RxTotal(Bytes)=27066482, TxTotal(Bytes)=25335085, EP=1625, IF 10.100.31.23	Database: DI=512, DO=128, AI=160, AO=32, CNT=64	
4	Master#=1, Slave#=1204	10.100.31.247	1144	RxTotal(Bytes)=5517858, TxTotal(Bytes)=5160414, EP=1454, IP=3 10.100.31.24	Database: DI=512, DO=128, AI=160, AO=32, CNT=64	
5	Master#=1, Slave#=102	10.100.7.1	4694	RxTotal(Bytes)=49717192, TxTotal(Bytes)=1889248531, EP=610, I 10.100.7.102	Database: DI=512, DO=128, AI=160, AO=32, CNT=64	
6	Master#=1, Slave#=1022	10.100.7.1	4689	RxTotal(Bytes)=22113591, TxTotal(Bytes)=21732269, EP=1110, IF 10.100.7.22	Database: DI=512, DO=128, AI=160, AO=32, CNT=64	
7						
8	Master#=1, Slave#=103	10.100.7.1	4691	RxTotal(Bytes)=49873768, TxTotal(Bytes)=1895198427, EP=625, I 10.100.7.103	Database: DI=512, DO=128, AI=160, AO=32, CNT=64	

Below the table, there is a section for 'Users, Current Total=8' with a list: No.001 10.100.12.1, No.002 10.100.31.247, No.003 10.100.7.1. A red circle highlights the 'Show Links' button. The interface also includes 'Auto Config Point DB', 'View Help File', 'DNP Slave Options' checkboxes (Rep ALL Points, DO and AO in Object Class 60, Check_Link_Reset_IIN, Sharing the Database with MB_Master, Enable_DNP Remote Forced Bit), and a 'Slave Simulator Run-Time:' section with a red LED indicator and the status 'Slave: RUNNING'. There are also 'RxLog' and 'Protocol' dropdown menus.

If the DNP Slave is connected over the LAN, you can **check the all TCP/IP LAN connections** by pressing the button of [Show Links]. All connections share the same point database. Right-Click on the current session/connection to determinate how to connect the Slave Point Database. **Refer to the next page.**

38. To Simulate DNP3 and Modbus Devices (Point Database)

continue

Close The List window

Listing connections between Slave End and Master End

Show The List of Master-Slave Connections

Check how often Master is polling Slave data.

DNP Slave 200(L) 53) Version 2.2018.9.28 -- Written by JH since 1986. Registered User: [REDACTED]

2018/12/03 15:31:11.0904 Selected LAN Connection=2-2, Index=1

Point Database | Setup | Logs | Clients 10.21 or Slave#=22 | CheckAddr=1 | Export

Ch#	Address	IP Address	IP Port	Messages	Slave IP	Others
0	Master#=11, Slave#=1055	10.11	51455	RxTotal=615973, TxTotal=1002178, Event-Poll=953, Integrity-Poll=180000, RA=0\10.	55	Database: DI=1024, DO=256, AI=512, AO=64, CNT=64
1	Master#=11, Slave#=1053	10.11	56292	RxTotal=616189, TxTotal=1004665, Event-Poll=953, Integrity-Poll=180031, RA=0\10.	53	Database: DI=1024, DO=256, AI=512, AO=64, CNT=64
2	Master#=11, Slave#=1056	10.11	53235	RxTotal=616261, TxTotal=1004742, Event-Poll=953, Integrity-Poll=180015, RA=0\10.	56	Disconnect TCP/IP LAN Connection
				.11 49275 RxTotal=609811, TxTotal=1021951, Event-Poll=984, Integrity-Poll=180031, RA=0\10.	82	Keep Me Silent (Do not reply any polling)
				.11 40343 RxTotal=609787, TxTotal=1026412, Event-Poll=984, Integrity-Poll=180000, RA=0\10.	83	Disconnect From Database (Reply with Data-Zero)
				.11 52214 RxTotal=115480, TxTotal=17426300, Event-Poll=12703, Integrity-Poll=12750, RA=10.	23	Connect Database exclusively
				.11 59105 RxTotal=115642, TxTotal=17426389, Event-Poll=14485, Integrity-Poll=14532, RA=10.	101	Restore Database connection for me now
				.11 47603 RxTotal=616093, TxTotal=1004557, Event-Poll=953, Integrity-Poll=179984, RA=0\10.		Restore Database connection for ALL
				.11 33948 RxTotal=616141, TxTotal=1002367, Event-Poll=984, Integrity-Poll=180000, RA=0\10.	51	Discover Session LogInfo
				.11 41648 RxTotal=600691, TxTotal=1011691, Event	54	Database: DI=1024, DO=256, AI=512, AO=64, CNT=64
				.11 60054 RxTotal=115606, TxTotal=17420787, Event		
				.11 55620 RxTotal=609739, TxTotal=1024114, Event		
				.11 52957 RxTotal=601723, TxTotal=1012852, Event		
				.11 60659 RxTotal=609931, TxTotal=1022086, Event		
				.11 49493 RxTotal=115606, TxTotal=17420787, Event		
				.11 42353 RxTotal=601714, TxTotal=107740137, Event		
				.11 43136 RxTotal=616021, TxTotal=1002232, Event		
15	Master#=11, Slave#=1095	10.11				
16	Master#=11, Slave#=1052	10.11				
17						

2018/12/03 08:41:00.6093 Ch#=14 [10.11] 11->1110 Request: Disable UnSol, FuncCode=21
 2018/12/03 08:40:58.4421 Ch#=10 [10.11] 102] 11->1102 Request: Disable UnSol, FuncCode=21
 2018/12/03 08:40:57.2859 Ch#=3 [10.11] 2] 11->1082 Request: Disable UnSol, FuncCode=21
 2018/12/03 08:40:52.8375 Ch#=13 [10.11] 81] 11->1081 Request: Disable UnSol, FuncCode=21
 2018/12/03 08:40:51.6859 Ch#=16 [10.11] 52] 11->1052 Request: Disable UnSol, FuncCode=21
 2018/12/03 08:40:50.6046 Ch#=15 [10.11] 95] 11->1095 Request: Disable UnSol, FuncCode=21
 2018/12/03 08:40:46.2328 Ch#=0 [10.11] 5] 11->1055 Request: Disable UnSol, FuncCode=21
 2018/12/03 08:40:44.9796 Ch#=12 [10.11] 72] 11->1072 Request: Disable UnSol, FuncCode=21

Slave=1053, Master=11 Rx=8401274 Tx=188049442 LAN:10.53 startRunningDriver

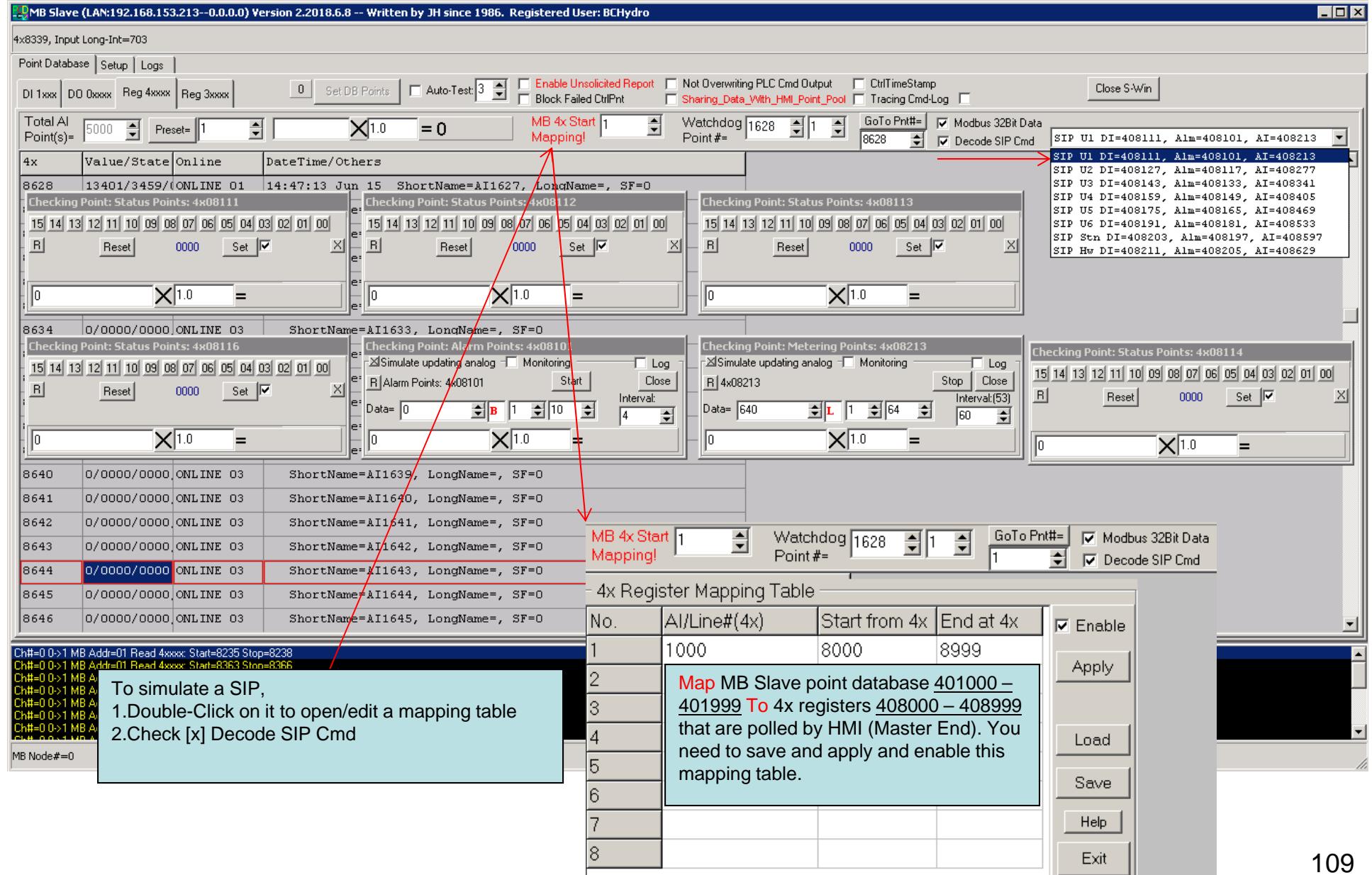
Refer to the last page. Right-Click on the current session/connection to determinate how to connect the Slave Point Database. *The default is all Slave sessions/connection share the same point database.* You can have the current session/connection link not to reply any data changes ([**Disconnect from Database (Reply with Data-Zero)**]) and the rest sessions still share the point database. You also can have the current session is the only one connected to the point database (**[Connect Database exclusively]**) and the rest sessions reply polling with Data-Zero only.
Note: If the current session/TCP IP connection is disconnected you have select another alive session to be connected or [Restore Database connection for ALL].

EP: Event Poll Interval/ How often the Master End polls Class 1/2/3.
IP: Integrity Poll Interval/ How often the Master End polls Class 0.

38. To Simulate DNP3 and Modbus Devices (Point Database)

continue

Prepare data animation for SIP (Modbus) Test



38. To Simulate DNP3 and Modbus Devices (Point Database)

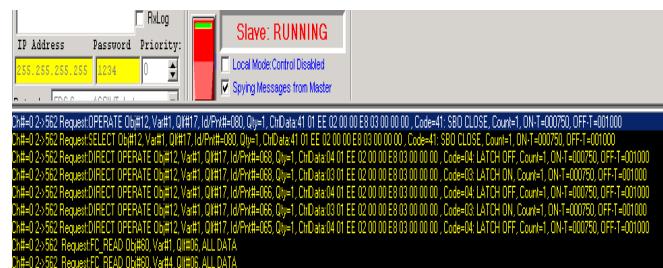
continue

Tracing Modbus Command – find what and how often is being polled.

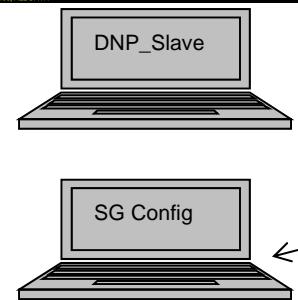
The screenshot shows the MB Slave software interface. At the top, it displays the version information: "MB Slave (LAN:192.168.153.211--192.168.153.215) Version 2.2018.9.28 -- Written by JH since 1986. Registered User: [REDACTED]". Below this, a message indicates a client is sending messages for the first time: "2018/12/03 08:40:45 .0921 ===== Client(#0) IP:192.168.153.211 sending messages 1st time. Rx=12 T=0 ===== WDT=100000". The main window contains a "Point Database" tab, which is selected. It shows a table with columns: "4x", "Value/State", "Online", and "DateTime/Others". The table lists six entries, each with a value of "0/0000/0000" and an "ONLINE 03" status. The "DateTime/Others" column contains descriptive text for each point. Above the table, there are several configuration options: "Total AI Point(s)" set to 5000, "Preset" set to 1, "MB 4x Start Mapping!" (highlighted with a red box), "Watchdog" set to 1628, "Point #=" set to 3, "Go To Pnt#=" set to 1, and checkboxes for "CtrlTimestamp", "Tracing Cmd-Log" (highlighted with a red box), "Modbus 32Bit", and "Decode SIP C". To the right of the table, there is a large scrollable area containing a log of Modbus commands. The log shows numerous entries starting with "3391 Ch#=0 [192.168.153.212]". Red annotations include a wavy line pointing to the "Tracing Cmd-Log" checkbox and another wavy line pointing to the log window. A callout box at the bottom left points to the log window with the text: "How often (in ms) the Master End is sending Modbus Commands to the Slave End."

38. To Simulate DNP3 and Modbus Devices (Point Database) – Continue

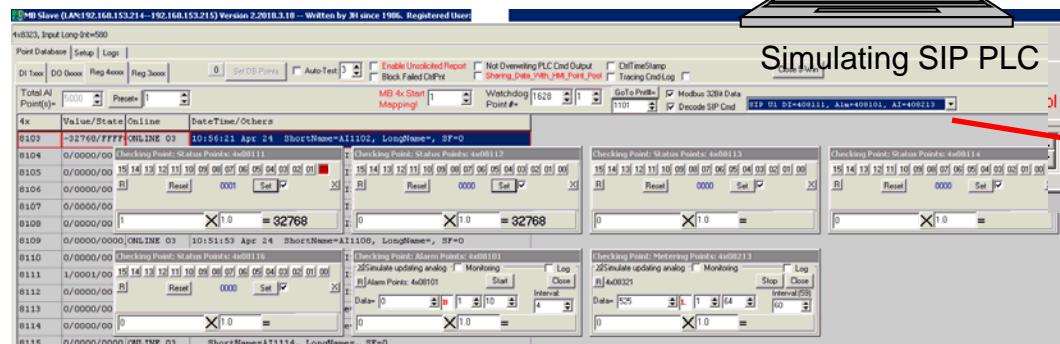
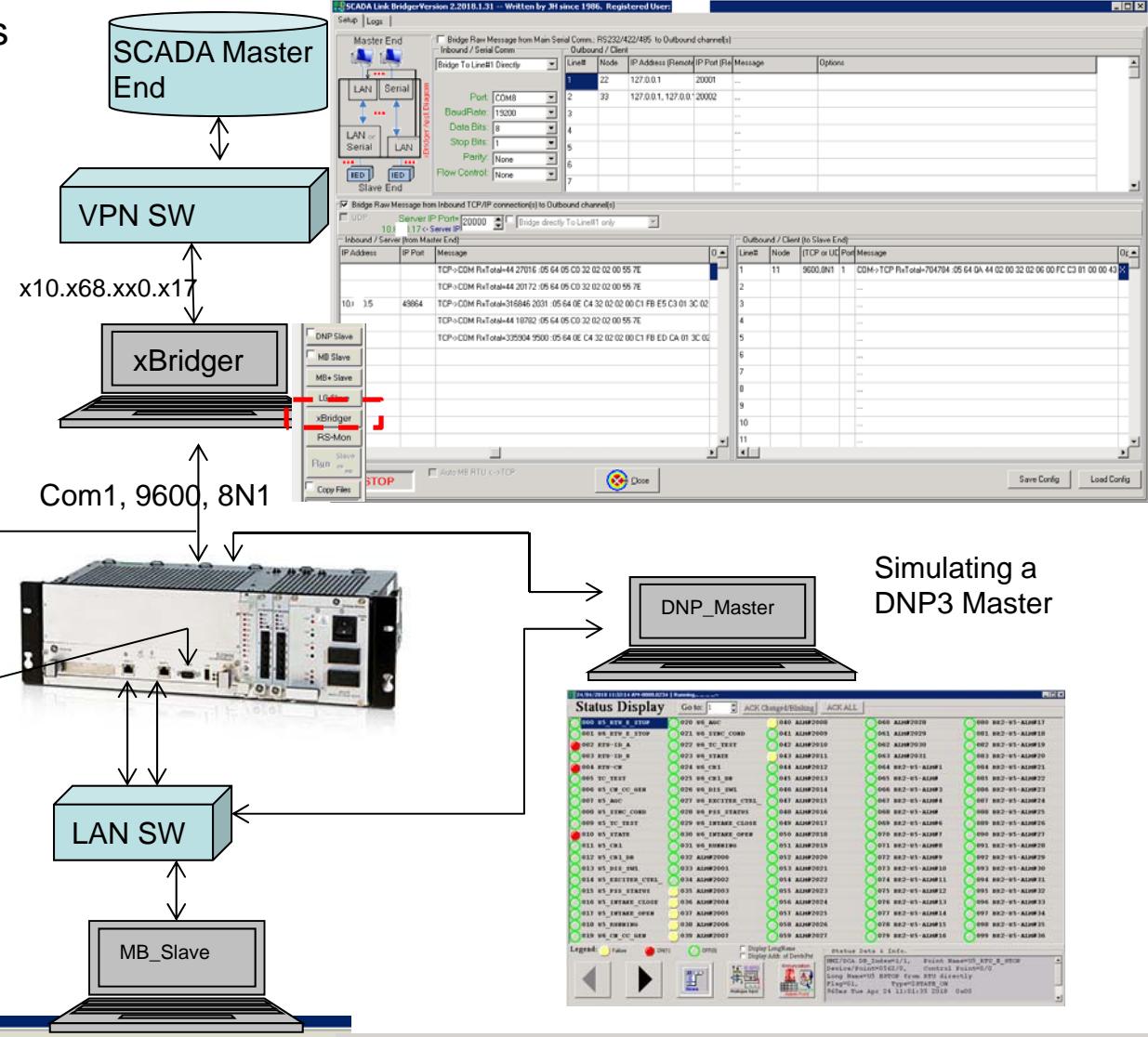
A Sample of How To Setup a Test Bench



Monitoring
DNP3
command
from FVO



DNP_Slave, MB_Slave, DNP_Master and SGConfig can be running on the same PC.
xBridger must be running on a separate PC.



Samples of Log (Controls from RTU to SIP PLC) in the next slide

39. To Set options for DNP3 Data Collection Application

Here is the list of DNP Obj Var that supported by DNP_Slave.

```

Obj#01 Var#0,1,2      Qlf#0x00,0x01,0x06
Obj#02 Var#0,1,2      Qlf#0x00,0x01,0x06
Obj#10 Var#0,2        Qlf#0x00,0x01,0x06
Obj#12 Var#1,2,3      Qlf#0x00,0x01,0x06,
                      0x17,0x27,0x28
Obj#20 Var#0,1,2,3,4,5,6 Qlf#0x00,0x01,0x06
Obj#21 Var#0,1,2,3,4,5,6 Qlf#0x00,0x01,0x06
Obj#22 Var#0,1,2,3,4,5,6 Qlf#0x00,0x01,0x06
Obj#23 Var#0,1,2,3,4,5,6 Qlf#0x00,0x01,0x06
Obj#30 Var#0,1,2,3,4,5 Qlf#0x00,0x01,0x06
Obj#32 Var#0,1,2,3,4,5 Qlf#0x00,0x01,0x06
Obj#40 Var#0,1,2,3,4   Qlf#0x00,0x01,0x06
Obj#41 Var#1,2,3       Qlf#0x00,0x01,0x06,
                      0x17,0x27,0x28
Obj#50 Var#0,1,2,3     Qlf#0x00,0x01,0x06,
                      0x07
Obj#60 Var#1,2,3,4     Qlf#0x06

```

Check DNP3 device profile.

DNP3 Master Address
DNP3 Slave Address
Interval to poll event (Class1,2,3)
Interval to poll ALL (Class0,1,2,3)
Digital Output Control Mode
Control Feedback Poll
Timeout for Controls
Timeout for Communication Link
Time Sync
... ...

DNP3 Master DCA					
No	Addr. Point Name	Present Value	Last Value	Flag	Time Date
*0513	00011 D11-AI1 Dev#00011 AI #0000 Pri#1 DataTyp 0	0	0	8003	12:05:19 Oct 26
*0514	00011 D11-AI2 Dev#00011 AI #0001 Pri#1 DataTyp 0	0	0	8003	12:05:19 Oct 26
*0515	00011 D11-AI3 Dev#00011 AI #0002 Pri#1 DataTyp 123.456	0.000	C001 Real Data 12:05:51 Oct 26		
*0516	00011 D11-AI4 Dev#00011 AI #0003 Pri#1 DataTyp 0	0	0	8003	12:05:19 Oct 26
*0517	00011 D11-AI5 Dev#00011 AI #0004 Pri#1 DataTyp 0	0	0	8003	12:05:19 Oct 26

DNP Slave (LAN:127.0.0.1--127.0.0.1) Version 2.2018.9.28 -- Written by JH since 1986. Registered User:

AI#2, Input Float=123.456/123.456/59769-17142

Point Database				Setup	Logs
DI	DO	AI	AO	Counter	
0	Set DB Points	<input type="checkbox"/> Auto-Test: 3	<input type="checkbox"/> Enable Unsolicited Report	<input type="checkbox"/> Not Overwriting PLC Cmd Output	<input checked="" type="checkbox"/> CtrlTimestamp
				<input type="checkbox"/> Block Failed CtrlPnt	<input type="checkbox"/> Sharing_Data_With_HMI_Point_Pool
Total AI Point(s)=	256	Preset=	1	123.456F X1.0 = 123.456	Watchdog -1 3 1
				<input type="checkbox"/> Obj#32 Var#3/4 (TimeStamp)	Point#=
AI#	Value/State	Online	Date/Time/Others		
0	0/0000/0000	ONLINE 01	ShortName=AIO000, LongName=, SF=1		
1	0/0000/0000	ONLINE 01	ShortName=AIO001, LongName=, SF=1		
2	123.456/123	ONLINE 01	Floating data 12:05:51 Oct 26 ShortName=AIO002, LongName=, SF		

```

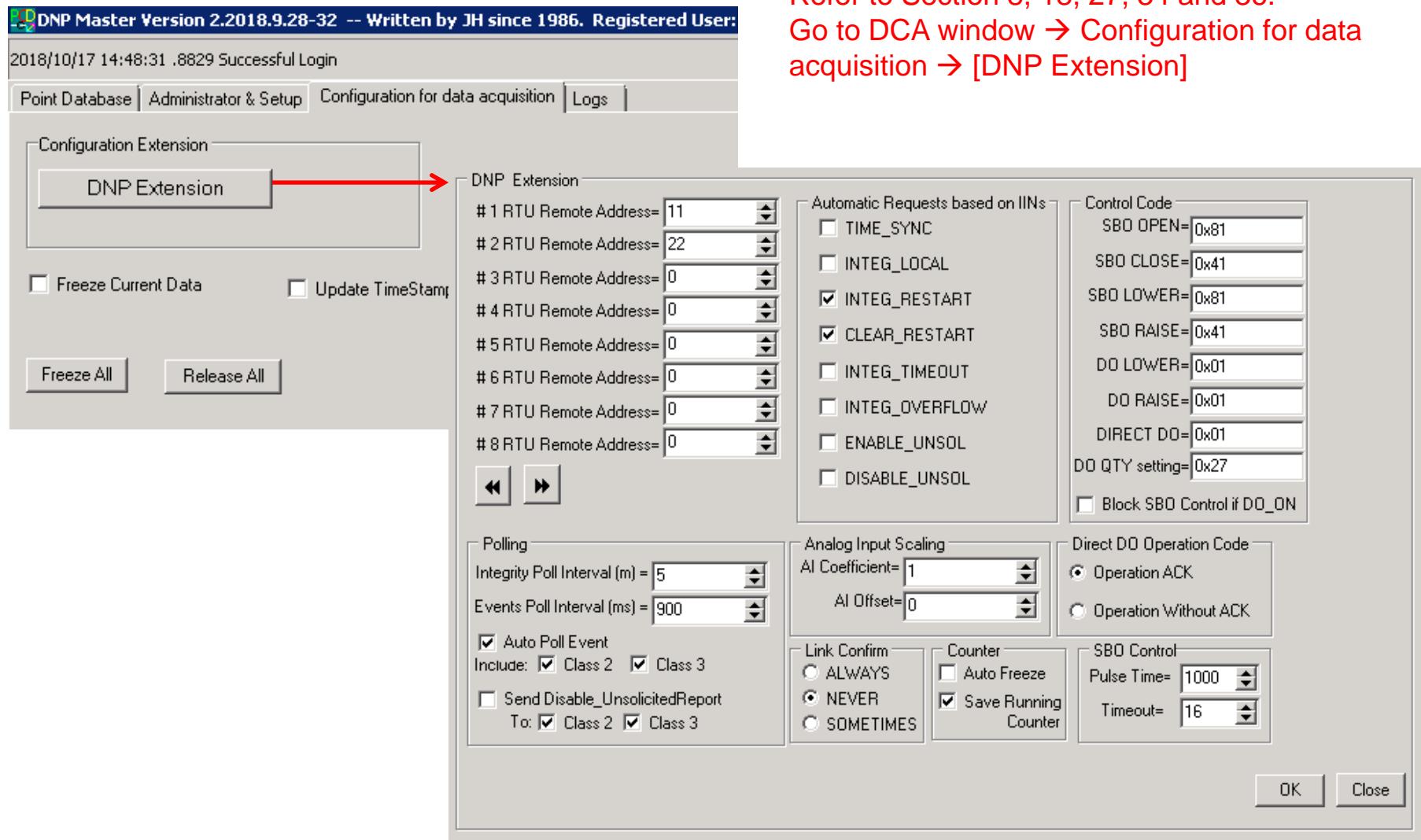
:ENTRY SAVE_RUNNING_COUNTERS = YES
ENTRY DEV_MASTER = 7
;
ENTRY DEV_LINK = TCP/IP
;;
;TELECOMM_CH = YES
;MULT_LAN_IP_AUTO_SWITCH = YES
Dev1 = 0, 122, 127.0.0.1 0.0.0.0, 20000
POLL_INTERVAL = 2000 300000
DO_CTRL_MODE = NOACK
DO_CTRL_MODE = YESACK
DO_CTRL_MODE = SBO
CONTROL_TIMEOUT = 6
LINK_TIMEOUT = 6000
END
;
;
ENTRY CONTROL = YES SINGLE-SBO
;
ENTRY DEV_DATABASE = SIZE
SESSION = 0
ENABLE_DO_CTRL_FEEDBACK_POLL = YES or NO
TIME_SYNC = YES or NO
;
;
POLL_CLASS2 = NO
POLL_CLASS3 = NO
SAVE_RUNNING_CNT = YES
READ_DNP_OBJ_RESPONSIVELY = YES
;
;
MAX_DI = 420
MAX_DO = 228
MAX_AI = 348
MAX_AO = 0
MAX_CNT = 0
END

```

DNP3 Master can automatically recognize and distinguish a floating point data (AI). There is no need to define it in DCA point database.

39. To Set options for DNP3 Data Collection Application

continue



40. To Set options for Modbus Data Collection Application

A simplified Modbus DCA database configuration

```
ENTRY      DEV_DATABASE = SIZE
SESSION     = 0
MAX_DI     = 0
;          DI_MB_1X_START = 1    1
;;          ChNo, Total(16 Points/Ch)
;          DI_MB_0X_START = 1    1
;;          ChNo, Total(16 Points/Ch)
;          DI_MB_REG_START = 1
;;          4X Register No.
MAX_DO     = 0
;          DO_MB_0X_START = 1    1
;;          ChNo, Total(16 Points/Ch)
;          DO_MB_REG_START = 1
;;          4X Register No.
MAX_AI     = 0
;          AI_MB_REG_START = 10
;;          4X Register No.
MAX_AO     = 0
;          AO_MB_REG_START = 100
;;          4X Register No.
MAX_CNT    = 0
;          CNT_MB_REG_START = 100
;;          4X Register No.
MAX_BR16   = 0
;          BR16_MB_REG_START = 100
;;          16bit register      4X Register No.
;
MAX_BR32   = 80
;          BR32_MB_REG_START = 10
;;          32bit register      4X Register No.
;
MAX_FR     = 1
;          FR_MB_REG_START = 1
;;          32bit floating      4X Register No.
;
END
```

40. To Set options for Modbus Data Collection Application

continue

```
ENTRY      DEV_DATABASE = SIZE
          SESSION = 0
          MAX_DI = 1024
;you also can use multi-command of Modbus as follows:
;Leading = PntNo MB-Datatype MB-DataAddress TotalPnt
;MB_CMD = X    0X,1X,3X,4X StartFrom      Max.1024 for DI, 112 for Reg. ScanFrequency
;          ; 100 - 4294967295 ms
;
;PntNo can be X as default setting
;
;MB_CMD = X    1X           1           1024
;MB_CMD = X    0X           1           96
;MB_CMD = X    4X           100        16
;
;          MAX_DO = 32
;you also can use multi-command of Modbus as follows:
;Leading = PntNo MB-Datatype MB-DataAddress TotalPnt
;MB_CMD = X    0X,1X,3X,4X StartFrom      Max.1024 for DI, 112 for Reg.
;          ; 100 - 4294967295 ms
;
;MB_CMD = X    0X           1           32
;MB_CMD = X    4X           100        16
;
;          MAX_AI = 0
;
;you also can use multi-command of Modbus as follows:
;Leading = PntNo MB-Datatype MB-DataAddress TotalPnt
;MB_CMD = X    3X,4X        StartFrom      Max.112 for Reg. ScanFrequency
;          ; 100 - 4294967295 ms
;
;MB_CMD = X    3X           1           10
;MB_CMD = X    4X           100        32
;
;          MAX_AO = 32
;you also can use multi-command of Modbus as follows:
;Leading = PntNo MB-Datatype MB-DataAddress TotalPnt
;MB_CMD = X    4X           StartFrom      Max.112 for Reg.
;
;MB_CMD = X    4X           100        32
```

40. To Set options for Modbus Data Collection Application

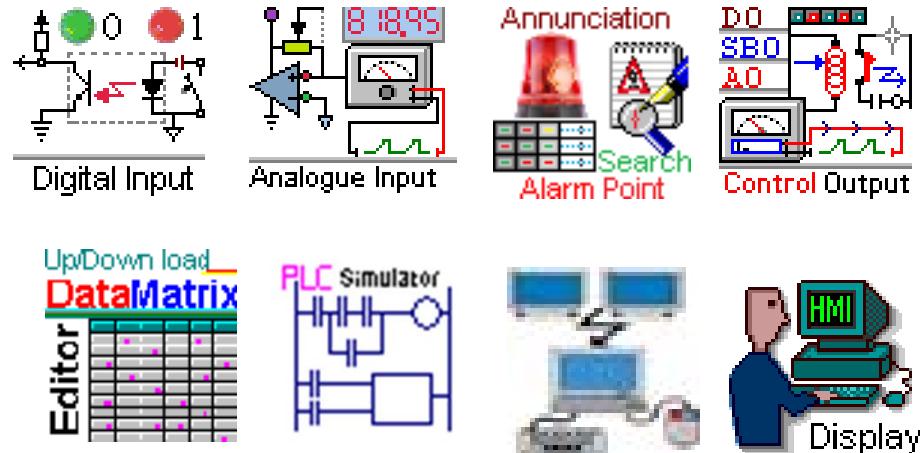
continue

```
;  
; MAX_BR16 = 32  
; you also can use mult-command of Modbus as follows:  
;Leading = PntNo MB-DataType MB-DataAddress TotalPnt  
;MB_CMD = X 3X,4X StartFrom Max.112 for Reg. ScanFrequency  
; 100 - 4294967295 ms  
;  
; MB_CMD = X 4X 100 32 2000  
;  
;  
; MAX_BR32 = 32  
; you also can use mult-command of Modbus as follows:  
;Leading = PntNo MB-DataType MB-DataAddress TotalPnt  
;MB_CMD = X 3X,4X StartFrom Max.112 for Reg. ScanFrequency  
; 100 - 4294967295 ms  
;  
; MB_CMD = X 4X 100 32 2000  
;  
;  
; MAX_FR = 32  
; you also can use mult-command of Modbus as follows:  
;Leading = PntNo MB-DataType MB-DataAddress TotalPnt  
;MB_CMD = X 3X,4X StartFrom Max.112 for Reg. ScanFrequency  
; 100 - 4294967295 ms  
;  
; MB_CMD = X 4X 100 32 2000  
;  
;  
; ENABLE_DO_CTRL_FEEDBACK_POLL = YES or NO  
; MODBUS_32BIT = YES  
; MODBUS_32BIT = NO  
; If YES, the 2nd Word(16bit) is the Bit31-24 of 32bit data, otherwise is Bit15-00 of 32bit data.  
;  
; Note: for Modbus data collection application, you may have to remove the flag of comment out: ;  
; and define xxx_START= xx xx accordingly. The default settings may not work for your application.  
;  
;  
; ENABLE_READING_PLC_STATE = YES  
; Note: Make sure MB Slave supports Modbus function code 0x11(17). It reads PLC state of RUN or STOP.  
;  
END
```

Others: xMasterSlave software set

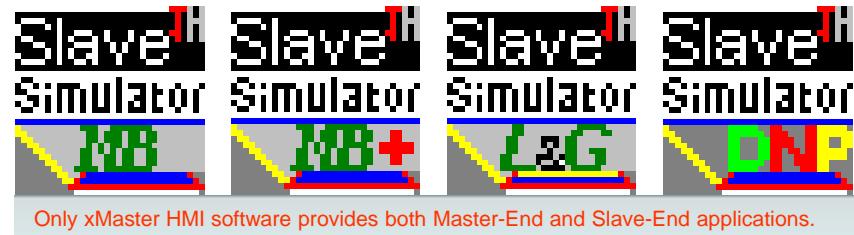
- **xMaster**

- DNP3.0
- Modbus (RTU Serial, TCP/IP)
- Modbus Plus
- L&G 8979
- Hostlink (Omron, etc.)



- **xSlave**

- DNP3.0
- Modbus (RTU Serial, TCP/IP)
- Modbus Plus
- L&G 8979



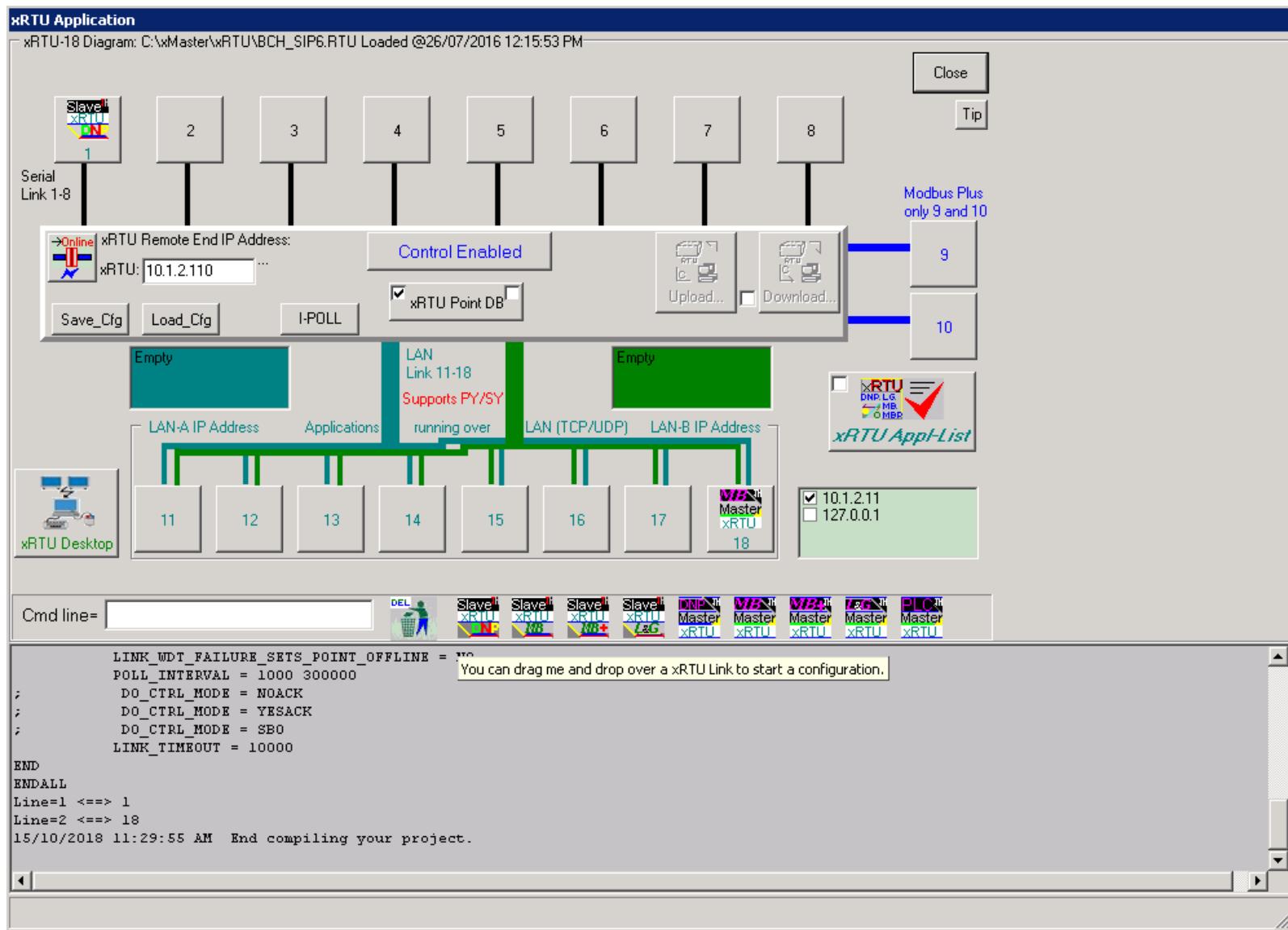
Only xMaster HMI software provides both Master-End and Slave-End applications.

A powerful MMI HMI SCADA system that features full process visualization, data collection and management, data logging and graphic display, historical trending, alarming, data archiving and recipe handing, and supervisory control, and much, much more in one complete Windows software package.

Others: xMasterSlave software set

continue

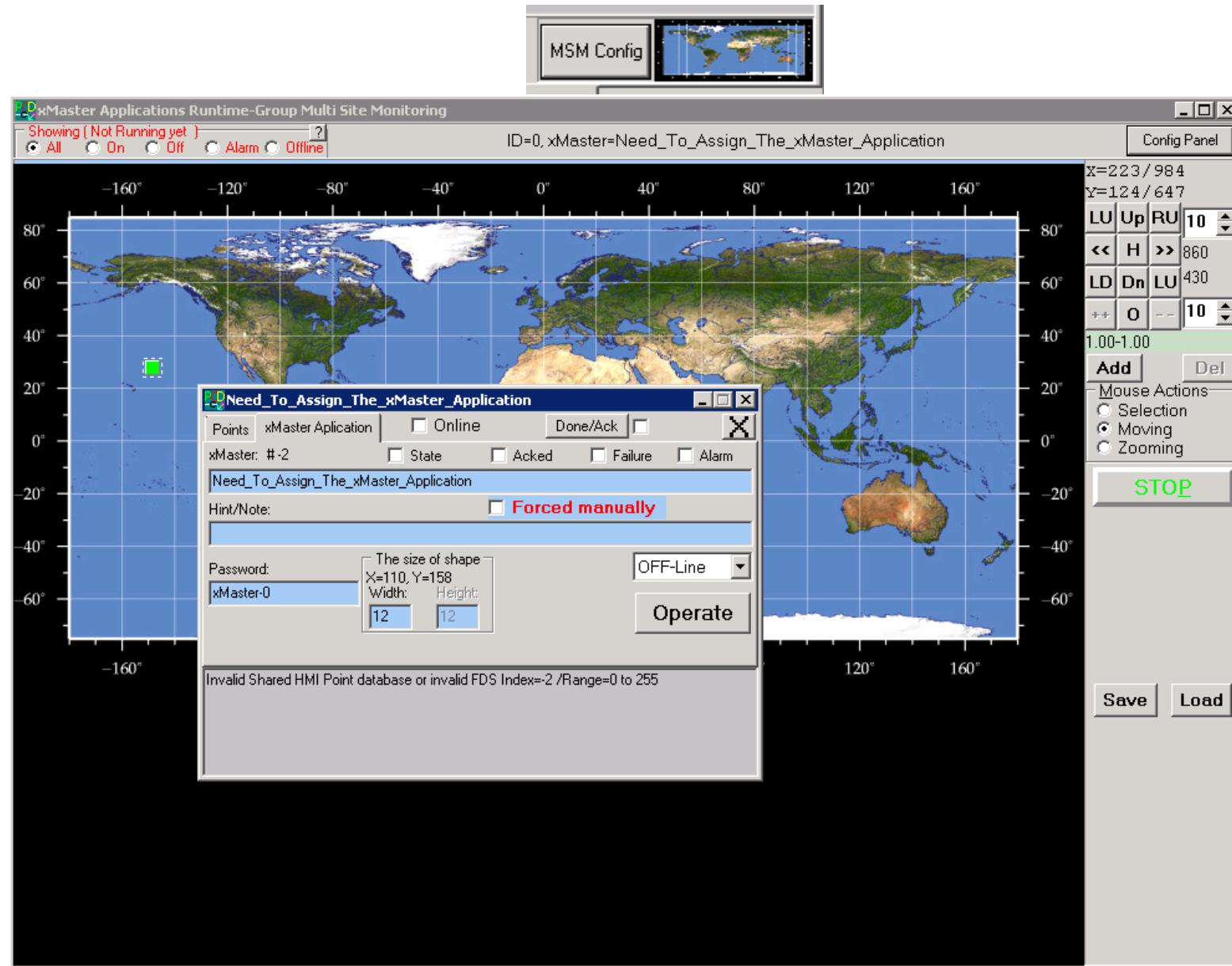
xMaster – xRTU18 Application



Others: xMasterSlave software set

continue

xMaster – a simplified GIS Application – Multi Site Monitor



Others: xMasterSlave software set

continue

xMaster – a Summary of Run-time

The screenshot shows the xMasterSlave Application Launcher interface. The main window displays a table of PLC configurations:

Line No.	Name	Line Status	Wdt,Addr-IIN	Integrity-Poll	Event-Poll	Controls
1	DNP_Master_Sample	ONLINE 0301	WDT=132, 11-0000	Start,Total DI=4096,AI=1024,PA=064,DO=512,AO=064	OK,PA#63=0/01	
2	MB_Master xxx PM MB_Master_Sample.txt	Offline	WDT=0,	,Total DI=0000,AI=0000,PA=000,DO=000,AO=000	,	
3	MBP_Master xxx PM MBP_Master_Sample.txt	Offline	WDT=0,	,Total DI=0000,AI=0000,PA=000,DO=000,AO=000	,	
4	LG_Master xxx PM LG_Master_Sample.txt	Offline	WDT=4319,	,Total DI=0000,AI=0000,PA=000,DO=000,AO=000	,	
5	MB_Master xxx PM MB_Master_Mult_DCA_DB_Sample.txt	Offline	WDT=0,	,Total DI=0000,AI=0000,PA=000,DO=000,AO=000	,	
6	DNP_Master xxx PM dnp_master_abb_603_modem.txt	Offline	WDT=0,	,Total DI=0000,AI=0000,PA=000,DO=000,AO=000	,	
7	MB_Master xxx PM MB_Master_RS485_ADAM4017.txt	Offline	WDT=0,	,Total DI=0000,AI=0000,PA=000,DO=000,AO=000	,	
8	PLC_Master xxx PM Omron_Master.txt	Offline	WDT=0,	,Total DI=0000,AI=0000,PA=000,DO=000,AO=000	,	

At the bottom of the interface, there are several buttons and status indicators:

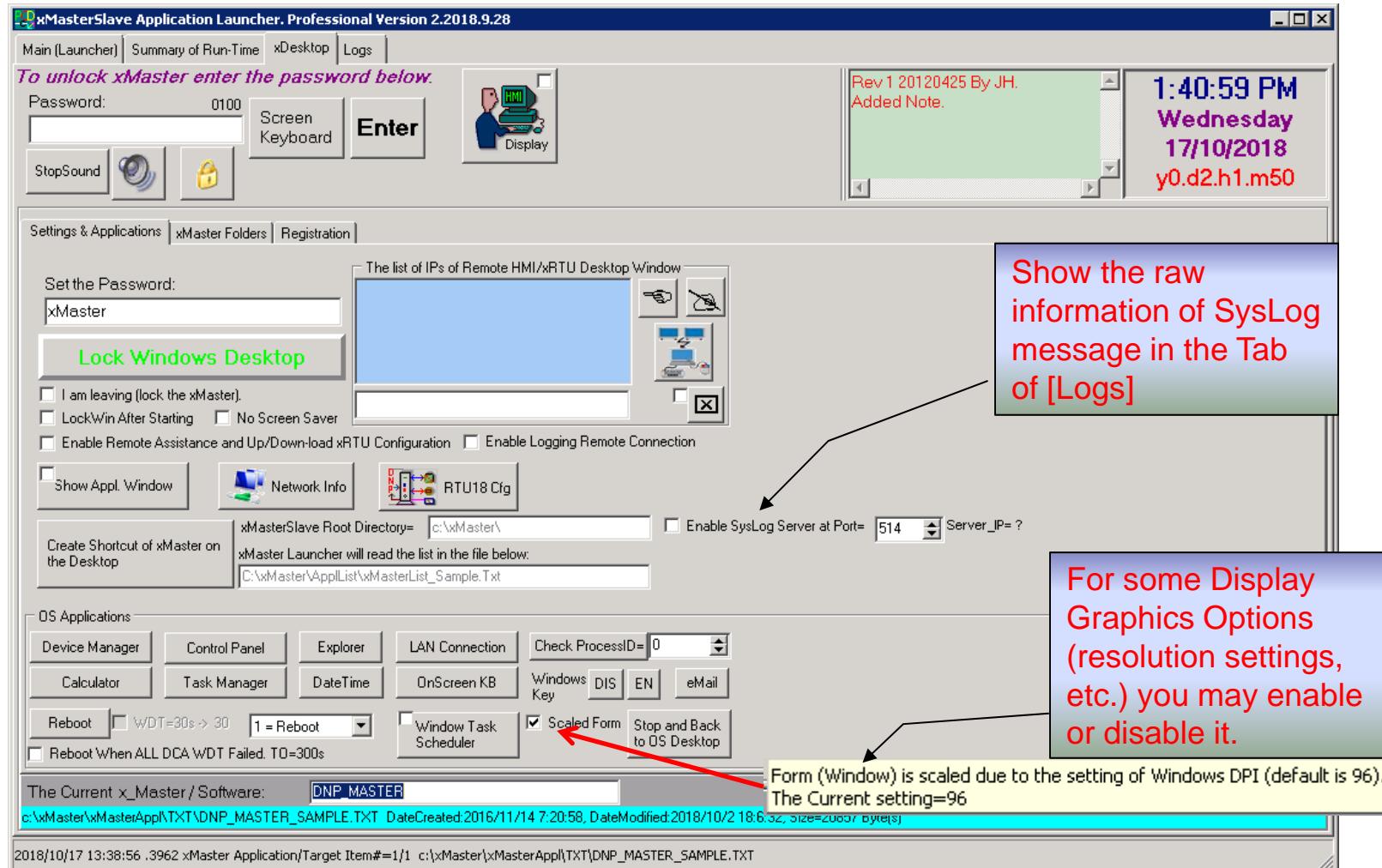
- Shared HMI Point Database:
- Force Updating Realtime Info
-
- Incl. xMaster Launcher
- 1:39:31 PM
Wednesday
17/10/2018
- Reset Shared HMI Point
- Refresh Summary

A log message at the bottom left reads: 2018/10/17 13:38:56 .3962 xMaster Application/Target Item#=1/1 c:\xMaster\xMasterAppl\TXT\DNP_MASTER_SAMPLE.TXT

Others: xMasterSlave software set

continue

xMaster – xDesktop

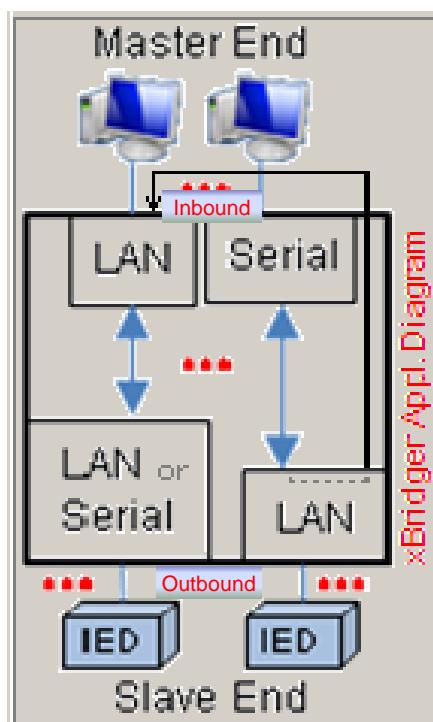


Others: xMasterSlave software set

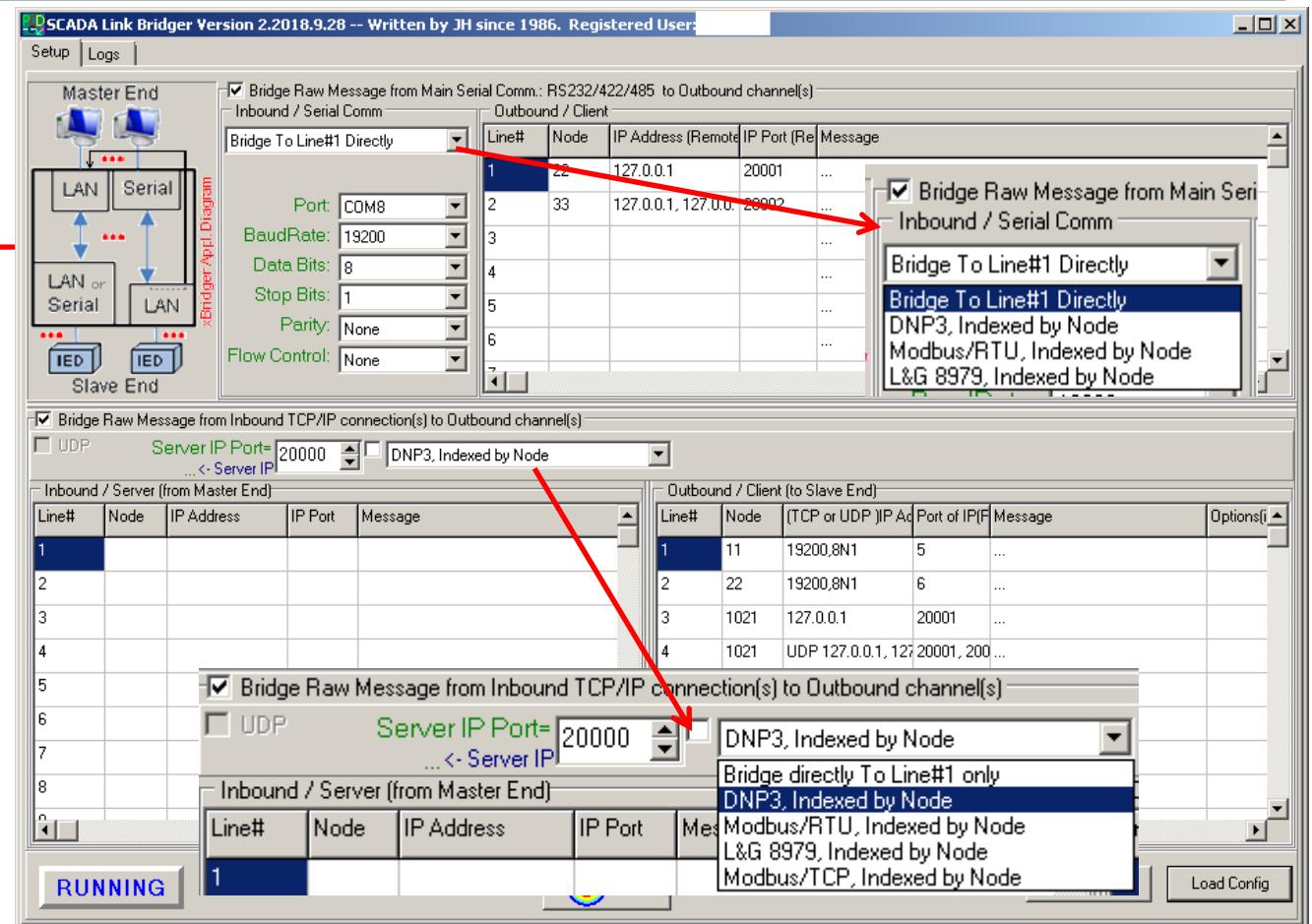
continue

xBridge – Ethernet Serial Servers

A Serial Connection to be distributed/bridged to LAN connection(s) directly or indexed by Node/Slave-Address.
A LAN connection (a Server, Inbound TCP/IP) to be distributed/bridged to Serial and/or LAN connection(s) directly or indexed by Node/Slave-Address. You can directly monitor all Connection Request, RAW message, and other troubleshooting messages.



xBridge
Applications
Diagram



Others: xMasterSlave software set

continue

Monitoring up to 8 Serial Communications simultaneously

