



Scalable Monitoring Archiving & Reporting Tool

User Guide

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1. Revision History

SMART Beta V 1.0.0.0
September 01, 2016

Initial release

2. Introduction

SMART is a windows based software which supports modbus (485, TCP-IP) device products. It provides true data collection and monitoring function, such collected data will be view in tabular, graph, zoom observation, file saving, and dynamic transfer to (*ms excel, spreadsheet, pdf, open office and text*) without any need for annoying programming. This software is basically “**Scalable Monitoring, Archiving & Reporting Tool**” so-called **SMART**.

Software is designed to streamline the process of downloading data and reviewing it in a user-friendly, time efficient manner. The software offers many customizable features and options, user can add masibus products manually and from auto device discovery facility, software includes many types of reports as (*daily data report, interval data report, monthly data report, monthly comparison of tag data and many more*), it also includes displays like tabular (*using a data table report allows the user to view the data and channels in a data table format*) and trend (*easily mark a desired point in time on any graph using time markers. Time markers appear as a vertical line in a graph*), independently set scale units (*for multiple parameter users can now choose to scale each channel independently to control how data is compared and viewed*), including the ability to change engineering units (*customizable engineering units enables users to support and program devices with many different unit types*), multiple device communication (*software can communicate with multiple devices through single interface cables*).

This software generates masibus products channel tags automatically, user can configure masibus devices and add tags for third party modbus devices which can be used to configure reports and displays. This software also has time stamped data logging facilities. User can configure software authentication password as per their requirement.

This software is capable to run on almost all windows based operating systems of windows 7 and above, other windows based server versions 2003 and above.

Thank you for choosing SMART for all of your data logging needs.

3. Software Installation Guide

3.1 System Requirement

Before you install the application verify that you have at least the following.

Hardware

Computer:	Pentium III / Celeron 866 MHz (or equivalent) or later (32-bit) Pentium 4 G1 (or equivalent) or later (64-bit)
Processor:	1 GHz or faster processor
Memory:	1 GB (recommended 2 GB)
Hard Disk:	4.5 GB of available hard disk space (x86) 4.5 GB of available hard disk space (x64)
Monitor:	Resolution should be set at 1280 x 768 Pixels (recommended 1366 x 768)
Color Palette:	Software contains 16-bit color graphics. It requires a minimum color palette setting of 16-bit color.

Software

Operating System:	Windows 7 (32 and 64-bit) Windows 8 (32 and 64-bit) / 8.1 (32 and 64-bit) Windows 10 (32 and 64-bit) Windows server 2003 (32-bit) Windows server 2008 R2 (64-bit) Windows server 2012 R2 (64-bit)
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Additional Software Requirement:

Acrobat Reader 10 or higher version
Microsoft Office 2013/2010/2007/2003
Microsoft .NET Framework 4.0 or higher version required

NOTE:

The following list describes restrictions for using software on windows:

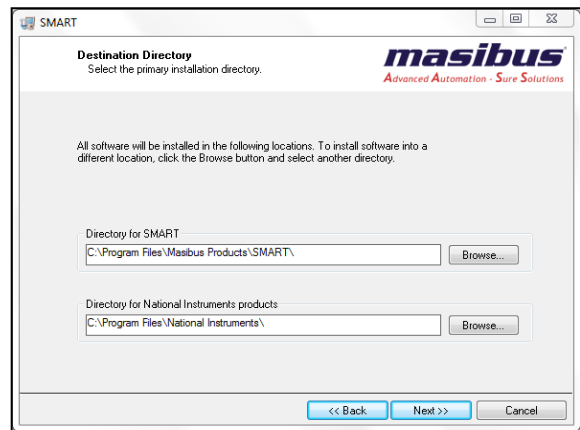
- You cannot access software using a guest account on windows.
- Although the software is designed to work with the windows operating systems listed above, software cannot guarantee operation on OS's no longer supported by Microsoft support life cycle policy.
- Software does not support windows 2000 / NT / Me / 98 / 95 / XP / windows vista.

3.2 Steps to install SMART

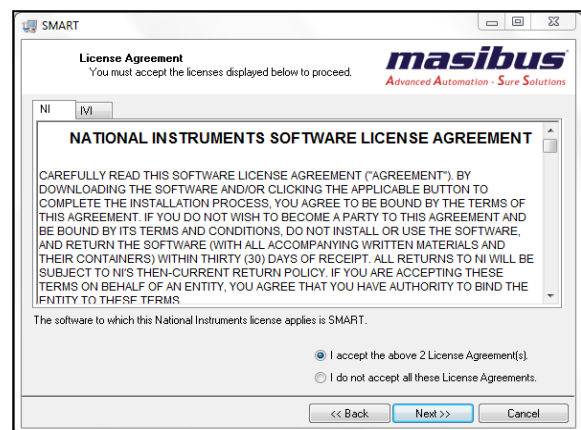
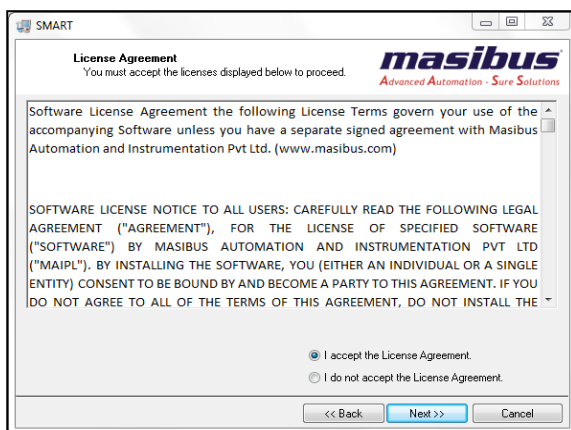
- 1) To install the SMART software from a drive, insert the installation source disk into the CD drive, **setup.exe** file is available in the **SetupVolume** folder as shown in below image.

	bin	7/20/2016 12:15 PM	File folder	
	license	7/20/2016 12:15 PM	File folder	
	supportfiles	7/20/2016 12:15 PM	File folder	
	nidist.id	7/19/2016 4:08 PM	ID File	1 KB
	readme.rtf	7/18/2016 11:56 AM	Rich Text Format	54 KB
	setup.exe	5/29/2015 1:33 PM	Application	1,422 KB
	setup.ini	7/19/2016 4:08 PM	Configuration sett...	16 KB

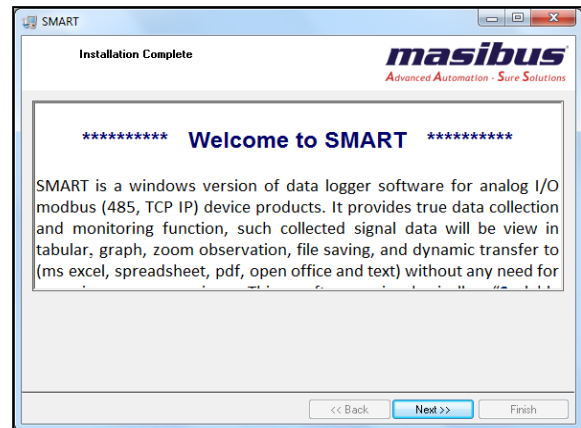
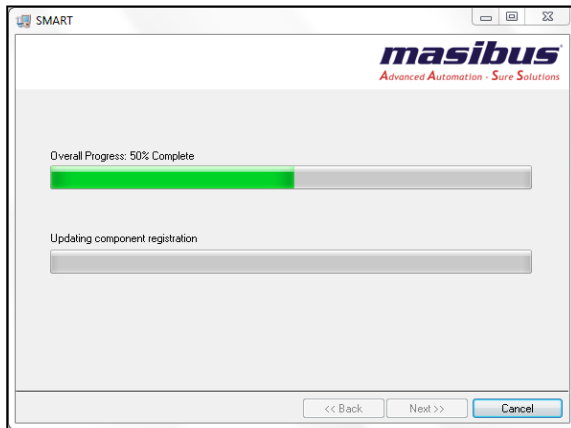
- 2) Double-click the **setup.exe** (application) to launch the installer options, when the installation welcome screen appears, click **Next** for the installation directory screen. The user can change the installation folder, if required. It is recommended to keep it at the default and then click on the **Next**.



- 3) Installer will appears masibus and national instruments software license agreements. Read the license agreement and accept it.



- 4) When accepting both the license agreement respectively, click on the **Next** twice and start the installation as described in next screen 1. The following dialog box will appear when the SMART have been successfully installed as shown in screen 2.

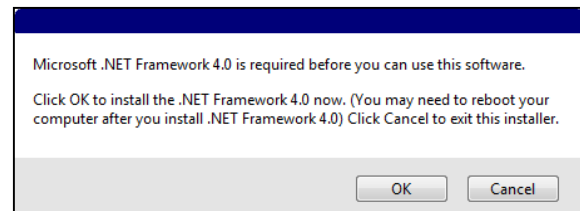


- Click on **Next**, SMART License Hardware Key driver installation window will appear. It is recommended to install driver for license key.

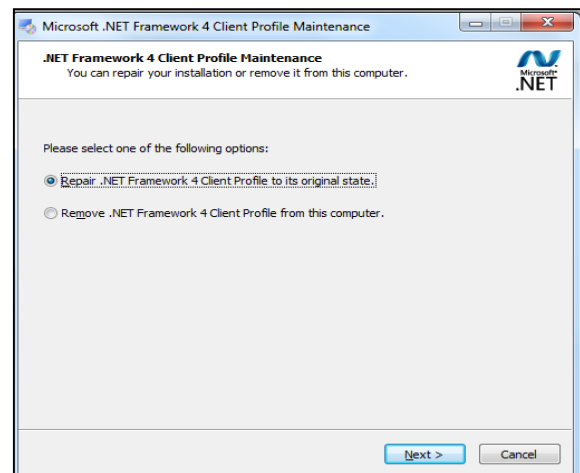
NOTE: User need to manually select USB Dog driver (for USB Port in PC) OR Parallel Dog Driver (For Parallel Port in PC). After selecting proper driver click on the **Install Driver**, it will start the installation, when installation is completed driver installation status window will appear as shown in screen.



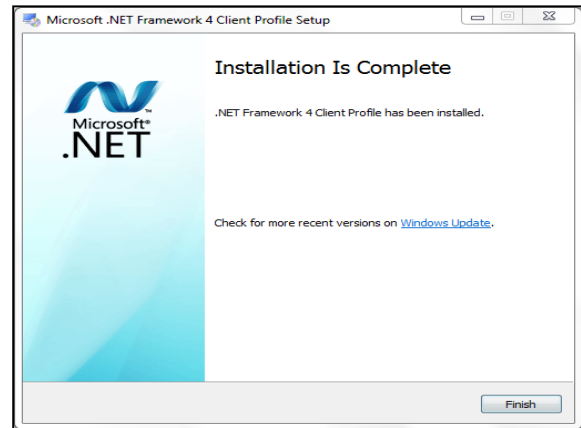
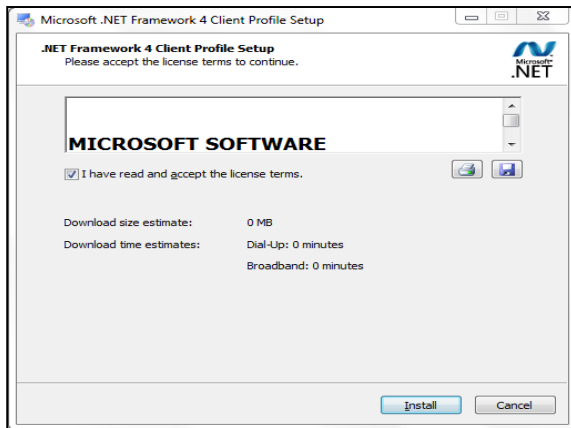
- 5) Now drive install setup program will install .NET Framework 4.0 Client profile setup. User need to select **OK** to install .NET Framework or **Cancel** to discard.



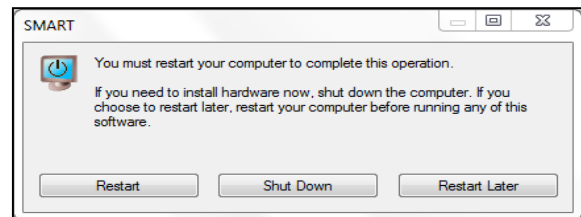
- If the .Net 4.0 Framework has already been installed and you attempt to run the install .Net 4.0 Framework, a window asking to repair or remove the .Net 4.0 Framework will appear. It is recommended to select the **Cancel** button when this page appears. If the higher version of .NET Framework is present in the client PC, then it will automatically proceed to the next level. If user click **OK** button, setup will execute and extract to a suitable place.



- Installer will appear Microsoft software license term. Read the license and accept it and click on **Install**. When the Installation Is Complete screen appears, click **Finish** to exit the wizard.



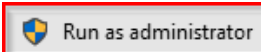
- You may be prompted to restart your computer dialog box when the SMART have been successfully installed. Click on the **Restart**. It is recommended to restart your system after installation to updates a DLL that is loaded in one or more processes that are required by Windows or makes changes to the registry.

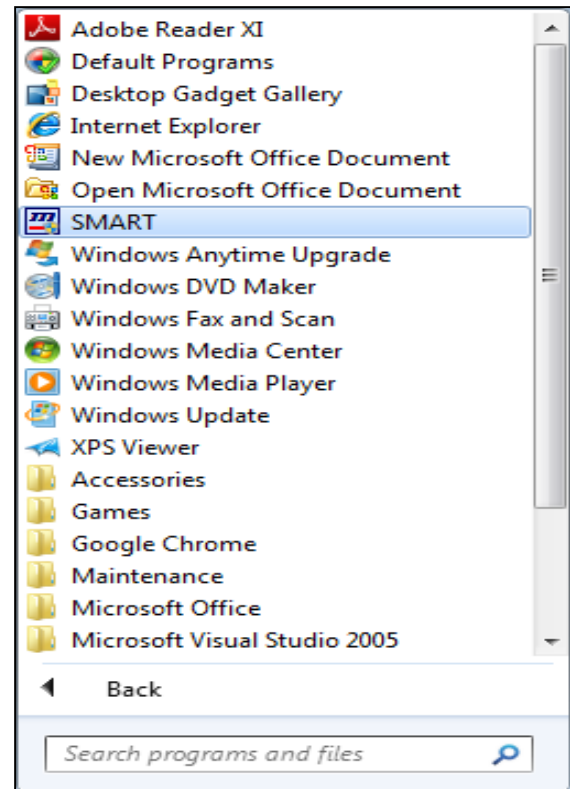


4. Basic Operation

This article explains the basic operation of SMART along with the procedure of data acquirement.

4.1 Starting the Software

To begin, launch the software by simply double clicking the desktop icon, or clicking the icon in the All Programs in the Start Menu. If application shortcut will not show as below with administrator access, you have to right click on it if you use a mouse and keyboard device. If you use a touchscreen, just press on the shortcut and hold. You should be able to see, an option  that allows you to run as administrator. If you run the application from an account without administrator permissions, the UAC prompt will ask you to enter the administrator password. If you don't provide the password, the program will not be launched.



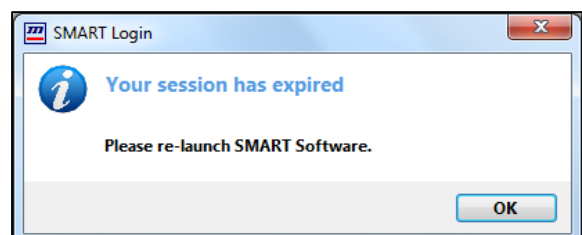
4.1.1 Startup Screen

- Startup screen will display current version of the software. The 2nd figure shows the SMART in the windows toolbar. Once the software is open, the user can make any and all preference changes that are necessary.

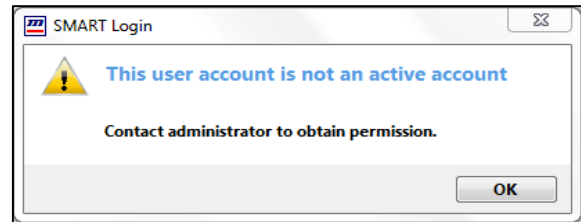


4.1.2 User Login

- On starting SMART, following Login To Access screen will be display. Users who fail to authenticate within 30 seconds, the timeout period expires, and the user is allowed to retry authentication by again launch the software as discussed above. Enter correct Username and Password, press **Login** to go to the main screen. Press **Close** to exit from the SMART.
- Default Username and Password - **Admin**.
- **Remember Me** - It will save Username and Password to auto fill for next login.

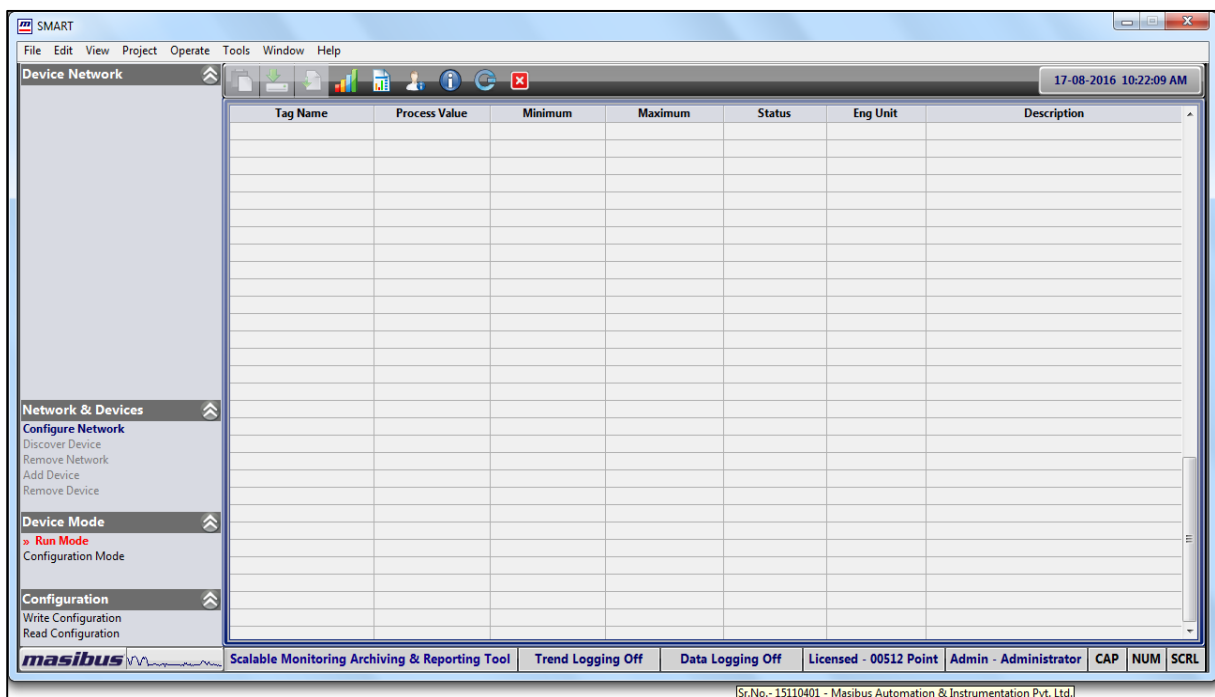


- If windows cannot access database by any of the reason like the database folder has not been set up for read/write access to the user (*access permission denied*), database cannot open, this problem is most likely related to access rights provided to database converter by your operating system in such cases error message will be displayed.
- If the user doesn't have an active account or permission then the following dialog will be displayed. To login the user must have active account with necessary rights using access levels.



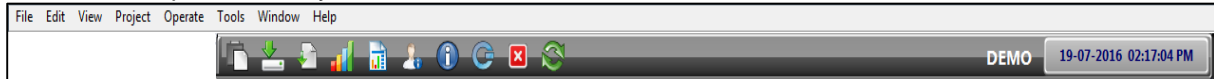
4.1.3 Getting Started

- After enter correct username and password user will redirect to following main screen. Each section of the software will be explained briefly in the following pages. Users with assigned access control level can configure initial setup or make necessary changes.
- Software will run in following two modes
 1. **Demo:** This is a free version of software with limited no. of access points (00006).
 2. **License:** Using USB flash drives, a software protection dongle (*commonly known as a dongle or key*) to access licensed version of software with assigned number of points.
- Thank you for purchasing SMART. This getting started guide describes how to use SMART. This article describes the simple step by step procedure for initially preparing the software with your host computer. The SMART is freely available as a demo version. User can purchase license key with required points.
Note: An alternative way to make sure the key's serial number is correct is to roll mouse on License info taskbar. The program will show tip tool with all information of key which will be attached to the computer via the USB interface as shown below.



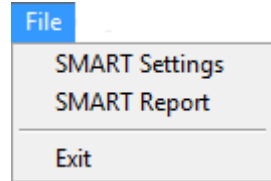
4.2 The Menus & Toolbar

Within the first upper tab titled, there are many different options that appear. Below is a brief description of every item.



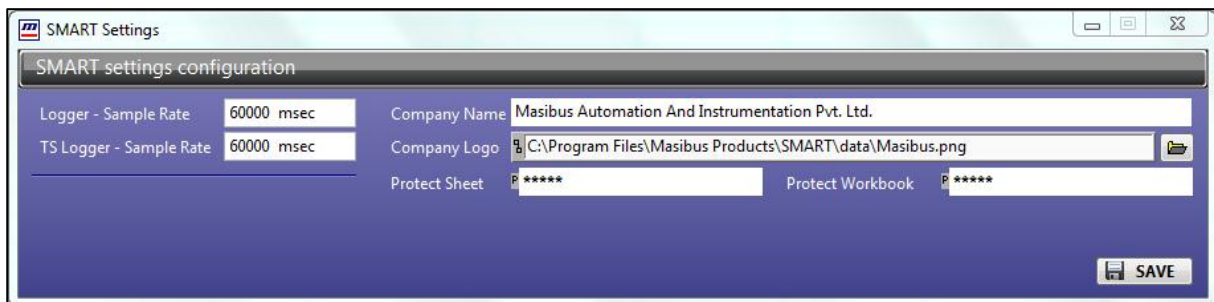
4.2.1 File Menu

- The File Menu offers following commands.

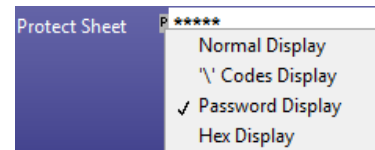


SMART Settings

- Use this command to edit the details of the Logger (*logging data for historical trend – min 1000msec max – 3600000msec*) and TS Logger (*logging data for report – min 15000msec max – 3600000msec*) sample rate, company name and logo path which will be print in the report, Protect Sheet (*password for excel sheet report*) and Protect Workbook (*password for excel report*).



- By default control information is as shown in above screen.
- When user click **SAVE**, it will updated the information for future use.
- The rate at which a network updates the real time parameters depends on various factors such as network speed, device response time, protocol type, total number of devices connected to the network. So if your network updates data from device within 2 seconds, setting a 1 second sampling rate is irrelevant. The default value you can modify by above wizard. Make sure that monitoring service is not running.
- Protect Sheet / Workbook password can be view in four different display as shown in figure.



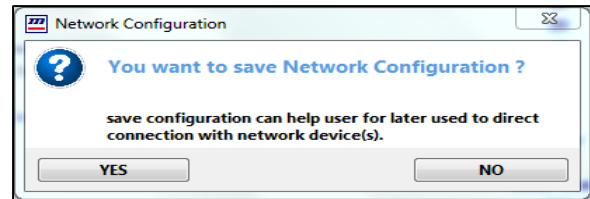
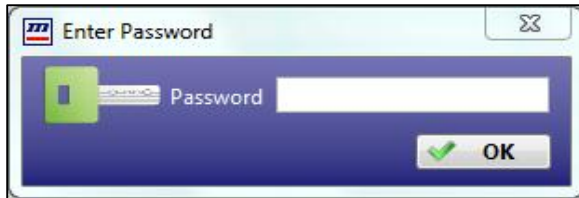
SMART Report

- No database server, no SQL programming, no report designer but still you have all those reports.
- Reports can be generated in the form of a data table and will be displayed in the many file formats. All saved (*as long as they haven't been permanently deleted*) will be located in report wizard. There are many types of reports to fit the user's need, which will be detailed in further section to view the data of a report in a different file format, users can generate a new report using the same data.

Exit

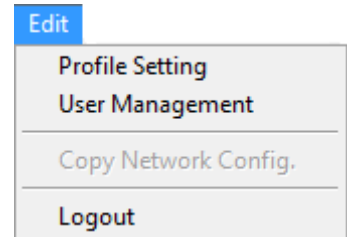


- Use this command to end your session. You can also use the **Exit** button.
- This action will terminate all services associated with SMART software. When user clicks on exit, first it will ask for the login password (Access password).
- Access password** - To prevent from unauthenticated users, some critical configuration, parameters changing and exit or logoff user needs to enter login password to access this functionality. When user enter correct password, it will ask to save network configuration (*if network was created*).



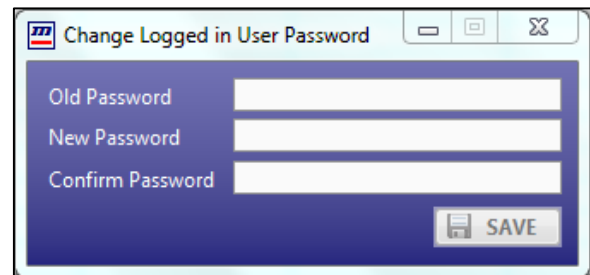
4.2.2 Edit Menu

- The Edit Menu offers following commands.



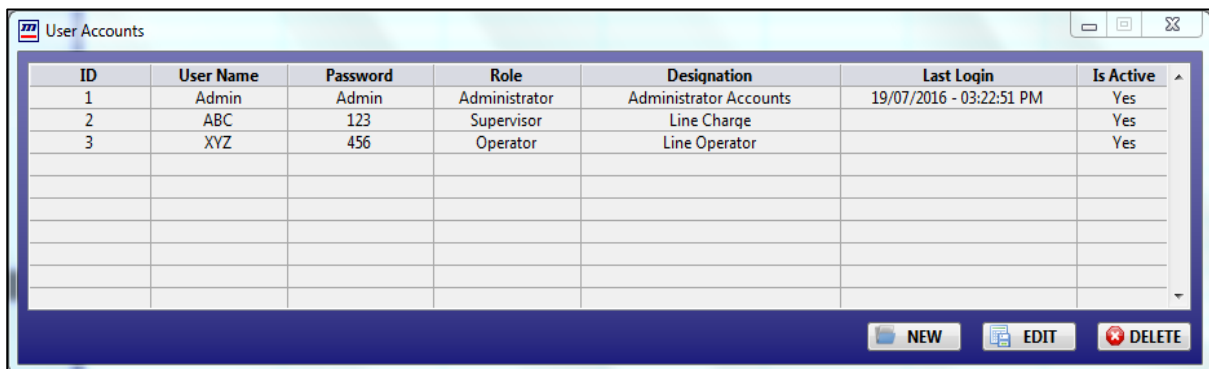
Profile Settings

- When login user want to change the password, click on the Profile Setting, below window will appear. Now enter the Old password and New password. Enter the same password in the Confirm password box which you have entered in the New password box. Now click on the **SAVE** to change the password.

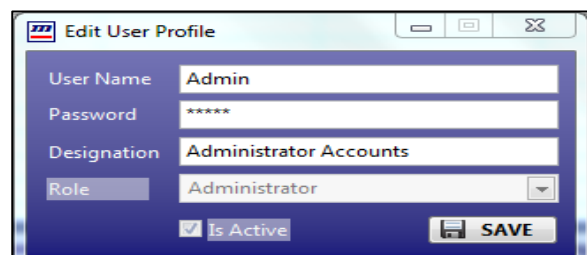
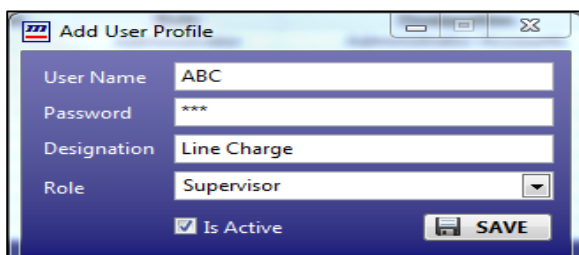


User Management

- Only administrator user has the access rights to view and update the user details. When click on User Management Menu (also through shortcut), it will ask for the password to view the details. After correct password user can view the following screen.

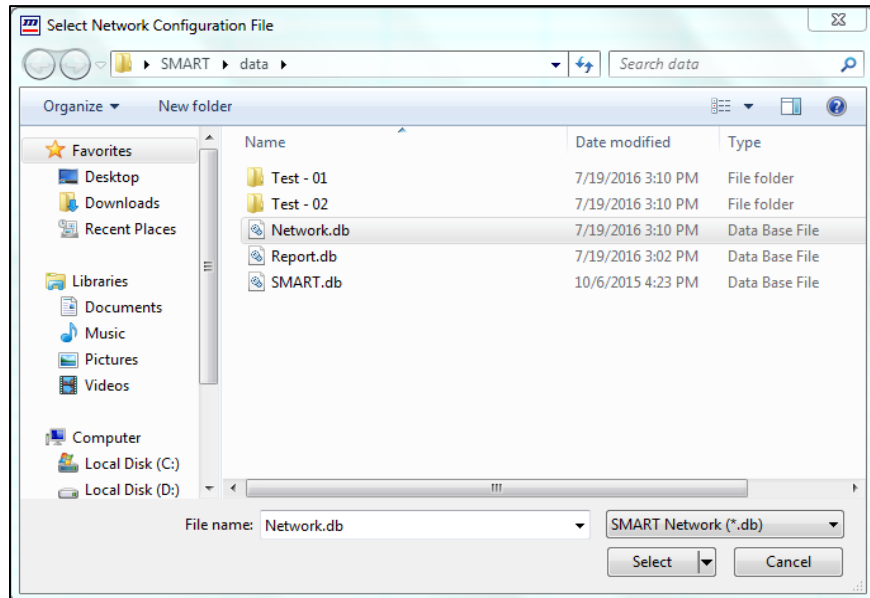
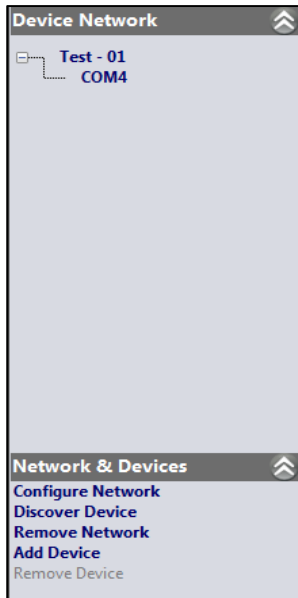
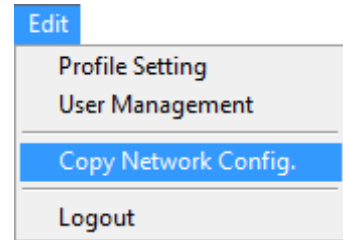


- User can view details of existing user accounts, create new user accounts, edit or delete any user accounts.
- User can create maximum 1000 user accounts and assign different access levels like administrator, supervisor or operator to those accounts.
- Since an administrator account is required to create other user accounts, you're assured to have at least one administrator account in your software.
- The Administrator account has full control of the software and can assign other user rights.



Copy Network Config

- To create a new device network configuration using the same data as the previous network (*only configuration removed from SMART software*), users will need to create a blank device network as shown in below tree navigation, the Copy Network Config menu will be enabled. Select the data file manually from previous device network configuration file "Network.db" by click on menu, user can view the explorer screen.

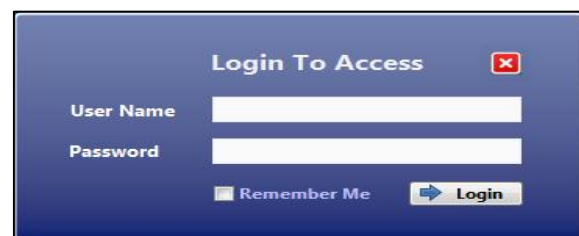


- The device network will be copy if and only if from previous configuration file that all devices and their respective tags which are used in that network must be present in SMART database. If fail to do so results in error to copy device network configuration.
- Successful duplication will shows all devices in Device Network tree navigation and all tags in Tag Wizard window as same as previous device network configuration.

Logout

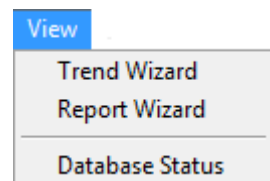


- Use this command (also through shortcut) to logout form current user account.
- This action will terminate all services associated with SMART software. When user clicks on Logout, first it will ask for the login password.
- When user enter correct password, it will ask to save network configuration (*if network was created*) same as while exit from SMART and it will logout from current user account and login screen will be display.



4.2.3 View Menu

- The View Menu offers following commands.



Trend Wizard

- Use this command (also through shortcut) to view the current trend as well as historical trend stored in the database, as it will be discussed in the next section.



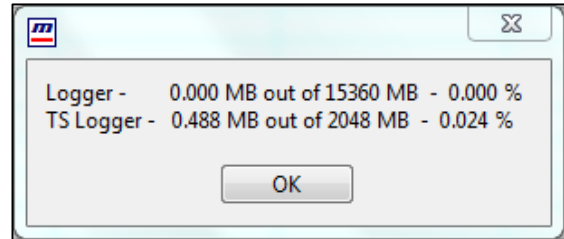
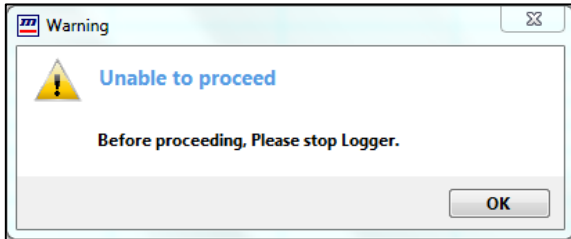
Report Wizard

- Use this command (also through shortcut) to generate the data report which was created from SMART Report wizard. User also can delete those reports permanently from this Report Wizard, as it will be discussed in the next section.



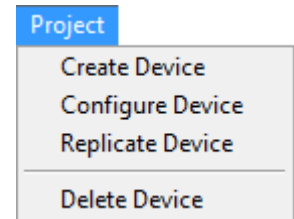
Database Status

- As your database file fills up with the data, its performance can degrade. User can switch to new device network as it creates and assigned to new databases. User can see database status using this command and software will auto pop up it on software launch.



4.2.4 Project Menu

- The Project Menu offers following command, as it will be discussed in the below.



Create Device

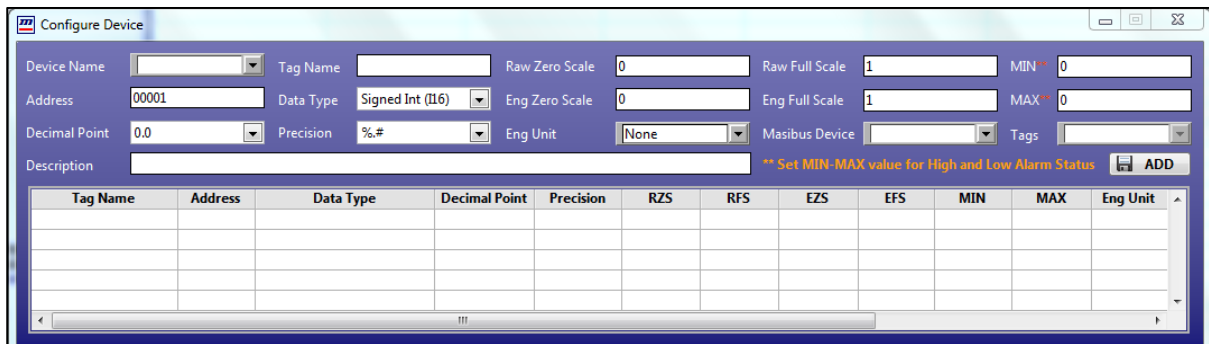
- This command allows user to create any third party device to be used in device network configuration.
- To create third party device click on menu, the pop up window will open as below. You need to write device name, if device name is acceptable then successful added message will be pop up otherwise error message will be pop up.
- If same device name was already present in SMART then warning message will be pop up to save with different name. Space and some special characters are not allowed to be use in device name.



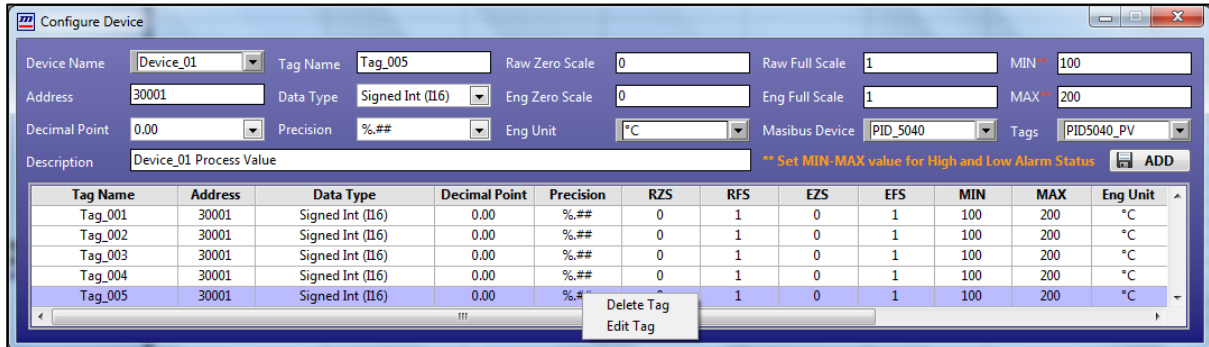
- User can used this device to configure tags (*will be explain in next section*) and in device configuration for monitoring, logging, trends and report.

Configure Device

- Using this command user can create, edit or delete unique tags in such created third party devices. To configure such devices click on menu window will arrive as shown in below.



- From device name drop control you can select device which you want to configure. Fill-ups all details of tag with non-repeated tag name (*max 10 characters*) and click **ADD** to create new tag for that device.
- User also can edit or delete such created tags by right click on selected tag and click respective menu as shown below.

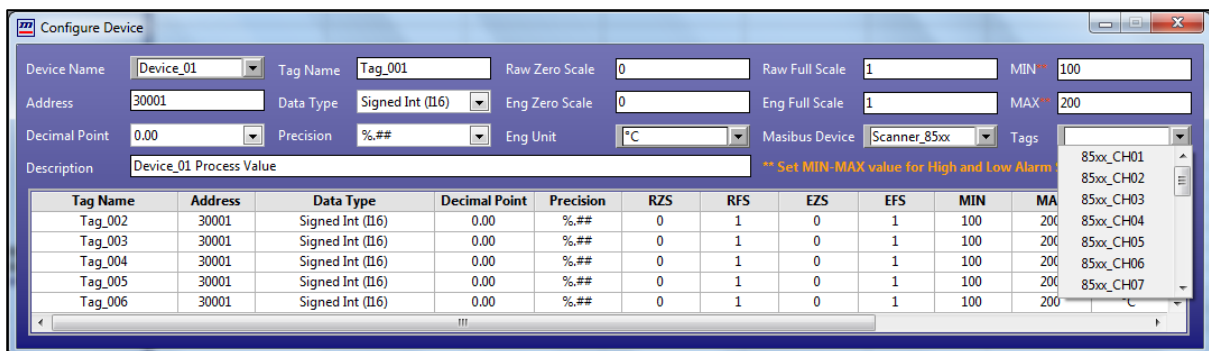


- When user select any device from drop control it will shows all present tags in that device in table.
- User can also create masibus devices tags in such created third party device from drop down selection menu directly.
- Independently set the scale units of a tag, this feature allows users to independently edit the scale and position of individual channels within a graph to optimize presentation. User can change the scaling of channel by using properties window as shown in figure. For scaling as for example the actual process value for tag is 10000 and we have to display it as 1000.0 so for that we have to put following values in properties window. In this case user need to set **0** in **decimal point** to avoid both scaling on single tag.

Raw Full Scale: 10000
Raw Zero Scale: 0

Eng Full Scale: 1000
Eng Zero Scale: 0

- Another way to scaling is from **decimal point**, user can take care while apply scaling on tag.



Replicate Device

- Using this command user can make a clone of such created third party devices directly by change only unique tag names. To replicate device click on menu as shown below window will arrive, from drop down menu user can select any device for which they want to create clone (*this future is used when more than one devices will be used in network with different slave*).



Tools

Calculator
Notepad

4.2.6 Tools Menu

- The Tools Menu offers following commands.

Calculator

- Use this command to open the Calculator form SMART software to do some calculation regarding values of incoming data.

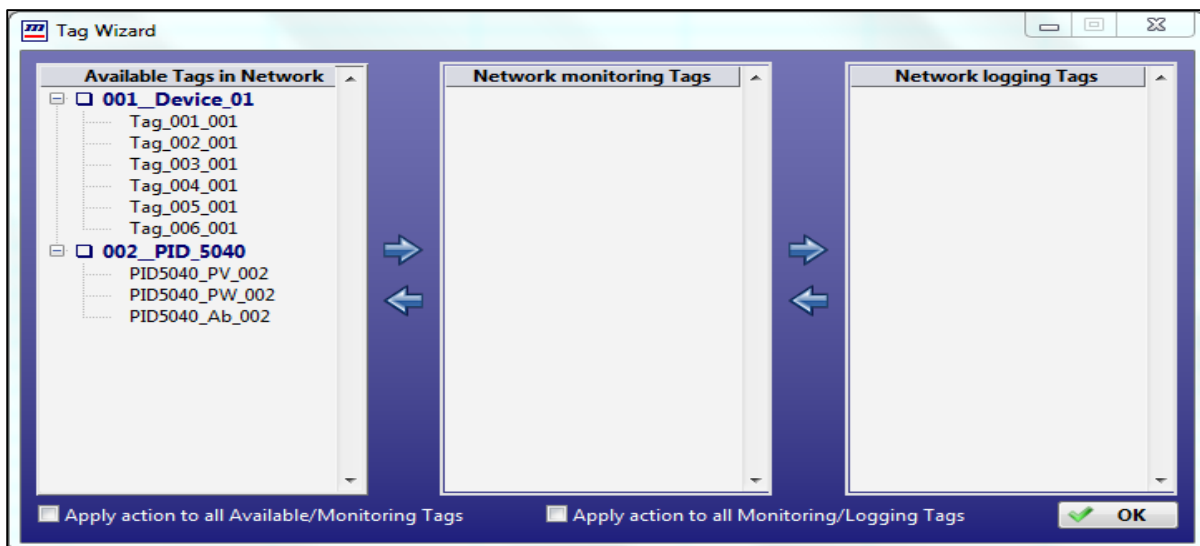
Notepad

- Use this command to open the Notepad form the SMART software to write and store something related to data logging and historical trend.

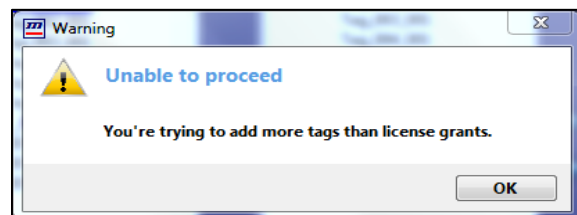
4.2.7 Tag Wizard



- After adding the device in network user can see the tags in Tag wizard as shown below.



- Using this wizard user can select tags from device network to set in monitoring as well as logging.
- User can add number of tag that they have license granted. If the user tries to add more, you'll receive a pop-up warning which will restrict to doing so as shown.



4.2.8 Monitoring



- By clicking this command user can start and stop monitoring of all selected tags from Tag wizard in main window as well as in trend window. It will be more discussed in the next section.
- You need to stop service on different occasions as follows:
 - Configuration setting is modified.
 - Logging may be enabled or disabled for some selected tags.
 - Tags & associated mappings are added or modified.
 - Device settings are modified.
- To stop the service, click on the above icon.
- Please note that when service is stopped, data archiving is also stopped, and interval data is not available for that particular period.

4.2.9 Logging

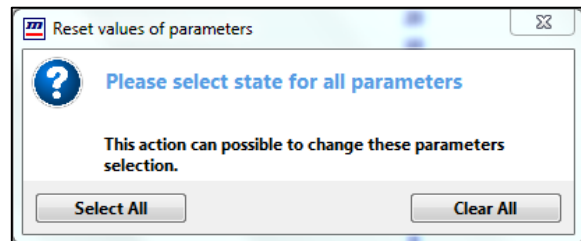
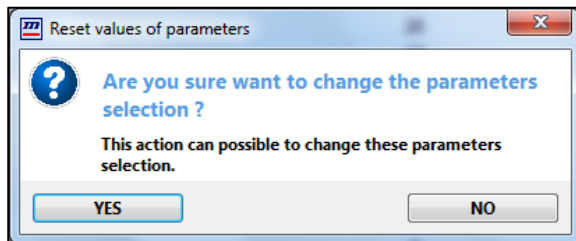


- By clicking this command user can start and stop logging of all selected tags from Tag wizard in logger as well as in time stamp logger. It will be more discussed in the next section.

4.2.10 Refresh

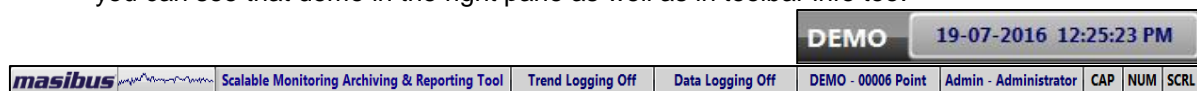


- This command is used with masibus device while user wants to reset all configurable parameters value to its default and selection to read/write in configuration mode. Using this command user also can select or deselect all parameters to write in device.



4.2.11 Demo

- SMART application software has been licensed with a hardware key. However, the application can be used without a hardware key in a demonstration (Demo) mode which is limited in number of points with full functionality. The screen similar to the following is shown, you can see that demo in the right pane as well as in toolbar info too.



4.2.12 System Time

- System date and time represents a computer system's notion of the passing of days and time on the calendar.

4.2.13 Windows

- This menu is reserved for future use.

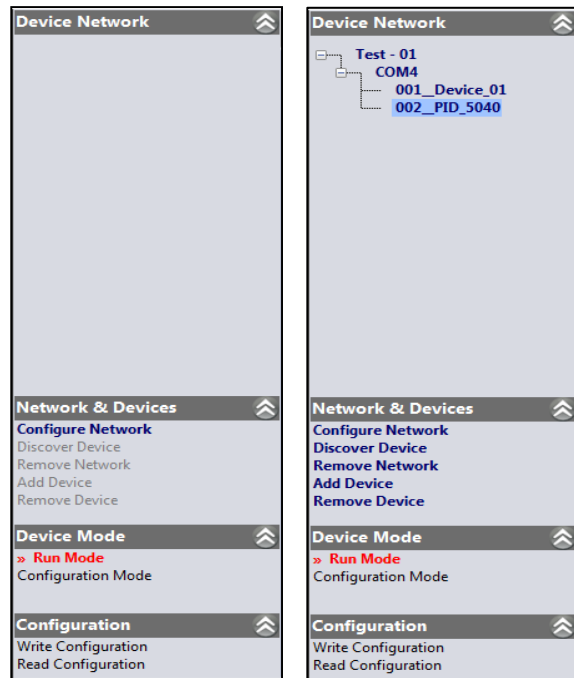
4.2.14 Help



- The Help Menu offers help command, use this command to view user's manual, features and functionality of SMART software. For further information described in this manual, please contact at support@masibus.com.

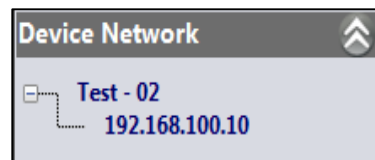
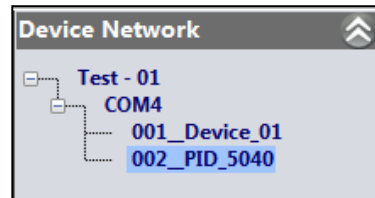
4.3 Screen Navigation

This section explains the basic tree navigation and its information used in SMART. It contains mainly four navigations, named Device Network, Network & Devices, Device Mode and Configuration. As using the tree navigation, you can invoke different functions of SMART by selecting the respective option. Using the “Device Network” navigation, you can view added devices in network. You can use “Network & Devices” navigation for network configuration, add or remove devices and remove network configuration. Using the “Device Mode” you can see run mode or masibus device configuration mode. You can use “Configuration” navigation to read or write masibus device parameters configuration.



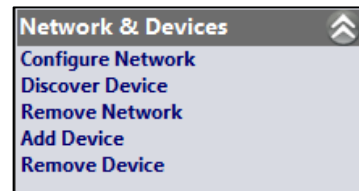
4.3.1 Device Network

- Device network configuration navigation tree will show the added devices with its communication parameter detail which are used for monitoring, logging, trends and reporting.
- First row shows the network name, then after com port for modbus 485 or IP address for modbus TCP-IP. After it all added devices with its respective slave ID in order of adding it to network.
- User can configure only one network at a time either it will be modbus 485 or modbus TCP-IP. How to configure device network will be discussed in the next section.



4.3.2 Network & Devices

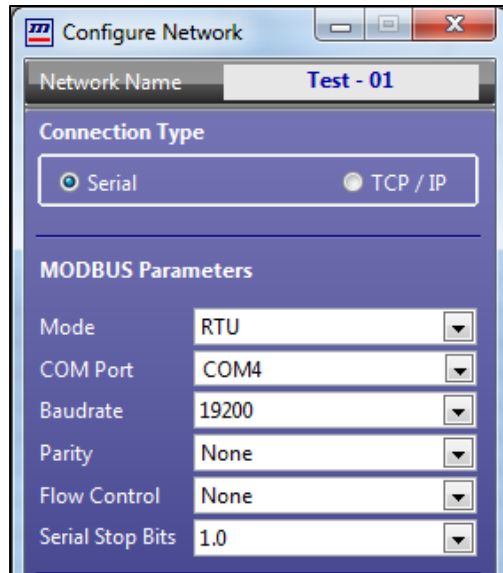
- Network & Devices navigation will allow user to add or remove network configuration, devices and auto search for masibus devices.



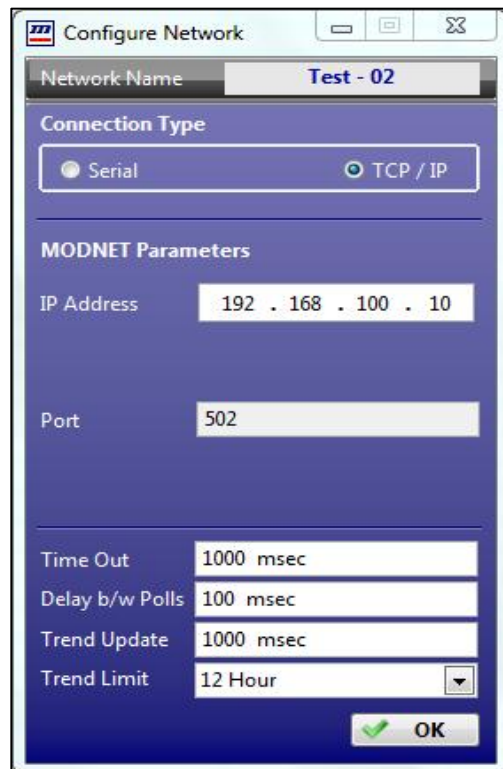
Configure Network

- For configuration of device network click on Configure Network. The pop up window will be open as shown below.
- **Serial** – To configure network with modbus 485 protocol user can select Serial from radio button, the list of parameters will show as screen.
- **Mode** – user can select any mode either RTU or ASCII as per their devices protocol settings.
- **COM Port** - user can select com port from drop down menu, it will show all available com in system.

- **Baud rate** - is the rate of transmission. The default is 9600.
- **Parity** - specifies the parity used for every frame to be transmitted or received. This input accepts the following values (none, odd and even).
- **Flow Control** - sets the type of control used by the transfer mechanism. This input accepts the following values (None, XON/XOFF, RTS/CTS, XON/XOFF and RTS/CTS, DTR/DSR, XON/XOFF and DTR/DSR).
- **Serial Stop Bits** - specifies the number of stop bits used to indicate the end of a frame. This input accepts the following values (1 stop bits, 1.5 stop bits and 2 stop bits).
- The recommended arrangement of the wires is as a connected series of point-to-point (multidropped) nodes, i.e. a line or bus, not a star, ring, or multiply connected network.



- **TCP/IP** - To configure network with modbus TCP-IP protocol user can select TCP/IP from radio button, the list of parameters will shows as screen.
- **IP Address** – is the address with which you want to establish a connection. This address can be in IP dot notation. If you do not specify an address, SMART establishes a connection to the local computer.
- **Port** – is the local connection port.
- **Time Out** - specifies the time, in milliseconds, for the write and read operations. The default is 1000.
- **Delay b/w Polls** - To allow the throttling of data request to the slave device the value entered is the delay time between read requests. Delay between polls is good because reduce a burden of server in case of many devices connected to it.
- **Trend Update** – The rate is the times in a milliseconds after that a trend display updates its buffer.
- **Trend Limit** - The parameter shows how many hours of data are remains in trend, after which user can see data by selecting previous or next button in trend wizard. More hour means that trend kips more data which results in degrade performance.

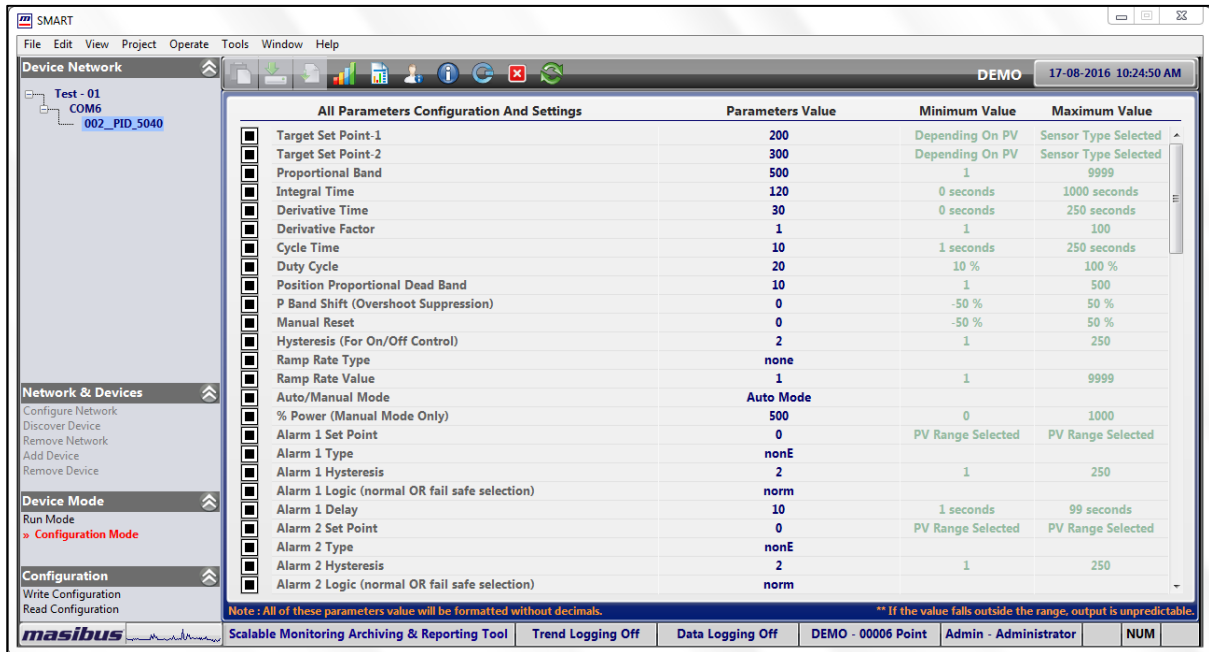


Discover Device

- By This feature user can find the masibus device (*It will search masibus devices in configured network parameters only like baud rate, parity, stop bits, etc.*) automatically connected on modbus 485 network. For that user have to click on Discover Device. The window will pop up. It will find the connected device on network and auto create tags of these devices (*when device is auto discover based on above parameters, it will create its respective monitoring parameter's tags with meaningful unique tag names*).

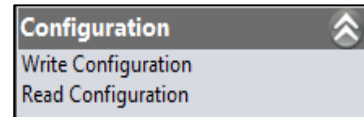


- **Configuration Mode** - if user select this option it will stop data monitoring and logging if it will be in progress and redirect to configuration window as shown below.



4.3.4 Configuration

- Configuration navigation will allow user to read / write configurable parameters data of masibus devices in Configuration Mode. Available parameters depend on the devices being selected.



- **Write Configuration** - if user select this option it will update device parameters value as selected from wizard respectively.
- **Read Configuration** - if user select this option it will update wizard parameters value from device.

4.4 Task Bar Information

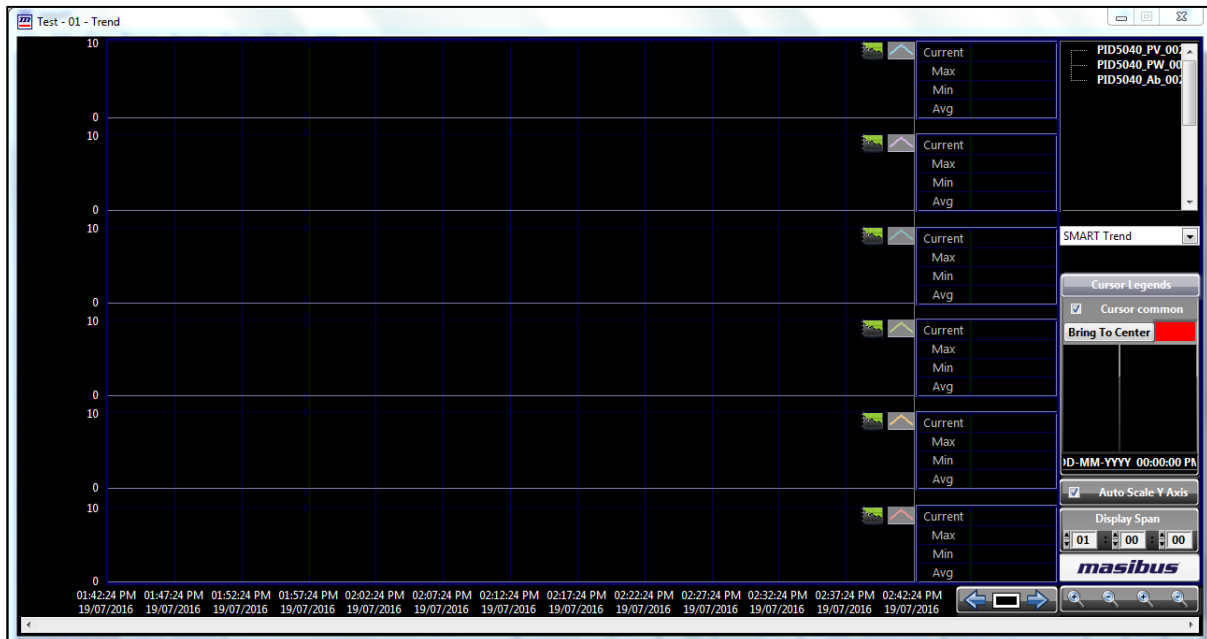
The frequently used information are prepared in Task Bar. It contains mainly Communication Status, Logger Status, Licensing, Login details and PC Key Status.



- **Communication Status:** On the status bar, a text color indicates its health status, green color shows SMART communicating with devices where red color shows there is an error.
- **Logger / Trend Status:** A text color indicates its health status, green color shows SMART logging data into logger database where red color shows there is an error.
- **TS Logger Status:** A text color indicates its health status, green color shows SMART logging time stamp data into logger database where red color shows there is an error.
- **Software License:** It will display software license information, "Licensed" with supported number of points in the info bar.
- **Login User Details:** It shows the login Username and it's account detail.
- **Caps Lock Status:** Caps Lock is a button on a keyboard that changes if a letter should be capitalize or not. It is located in the position of a similar Shift lock key (*and sometimes a Ctrl key*) found in some other keyboard layouts.
- **Num Lock Status:** Num Lock or Number Lock is a key on the numeric keypad of most computer keyboards. It is a lock key, like Caps Lock and Scroll Lock. Its state (*on or off*) affects the function of some of the keys, and is commonly displayed by an LED built into the keyboard.
- **Scroll Lock Status:** Scroll lock is a lock key (*typically with an associated status light*) on most IBM-compatible computer keyboards. Depending on the operating system, it may be used for different purposes and applications may assign functions to the key or change their behavior depending on its toggling state.

5. SMART Trend

SMART provides two types of display for online monitoring. These are trends and tabular. A trend log is a collection of time-stamp values. A trend type display is used for bar or line graph for one or more parameters.



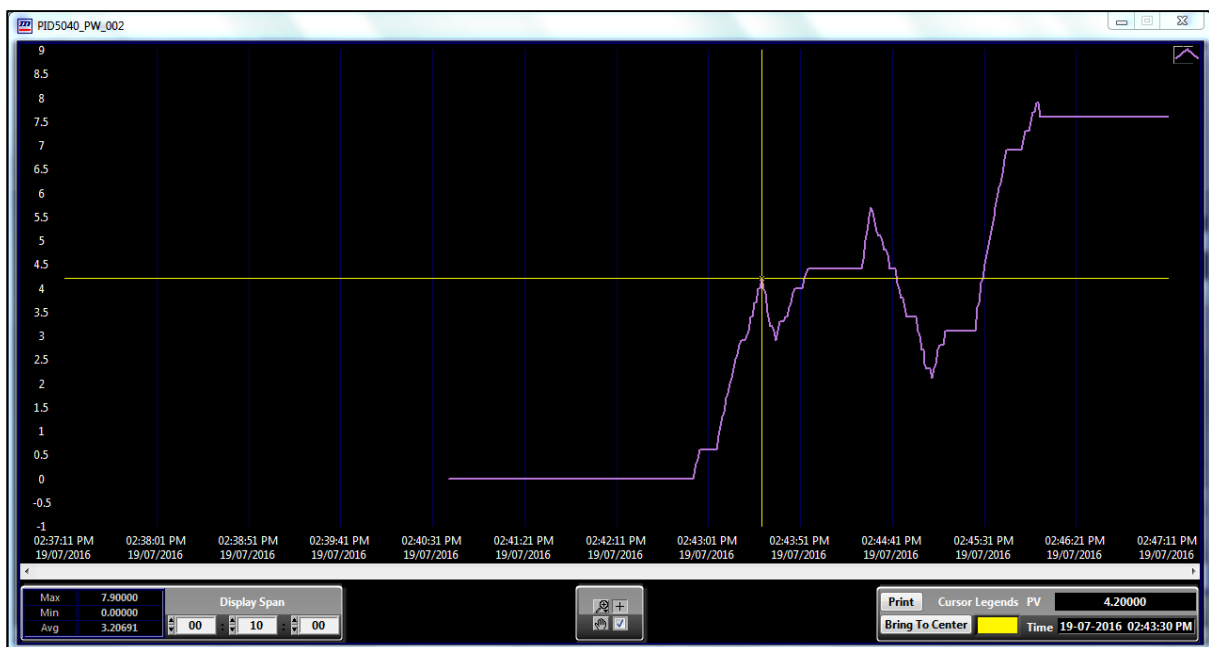
- **Trend Update Rate** - The rate at which the trend refresh its display, even a new value is available with it. Please note that logging rate and sampling rate specified has nothing to do with trend settings. It is only relevant to the display for which it has been specified.
- **Trend Limit** - The limit after which the trend will discard data records and leave it for history trend. When a data is monitoring in real time, a graph displaying the data can be set to automatically scroll horizontally so the most recent readings are always displayed.
- **Display Properties** - Display properties are specified for each individual trend. By default, SMART assigns a separate color to each of the trend and all other properties are same.
Note: You can select up to 06 tags in a trend.
- **Auto Scale Axis (Locking the Vertical Scale of a Graph)** - You use the auto range function to automatically adjust the trend x-axis and y-axis according to the range of the series displayed. The vertical scale of a graph can be locked to prevent any automatic adjusting from occurring when new data is added. Any values that lie outside the displayed range will not resize the graph view. To navigate in the trend in small steps, you scroll the x-axis in steps equal to the displayed page of the trend. To navigate in the trend in big steps, you click on previous or next button to displayed trend.
- **Export Data to Excel** - Using an export data, the user can view the data and time from the current graph to a data table reports which will be exported to Microsoft Excel®.
- **Display Span** - There are selectable time spans for these displays, this is specified for all trend. You set the trend time span of the x-axis relative to the series current end point time to automatically adapt the trend to display the current time and the latest records within the specific time span.
- **Zooming in a trend chart** - Trend charts are a way to graphically present trend logs. A trend chart can contain one or more trend logs that are represented in the trend chart by lines or bars. You can also add and remove trend logs from a trend chart. This makes it easy to

compare different trend logs, for example the energy consumption compared to the average temperature.

- By double clicking on tag names from tree menu user can select or remove tags to view data in trend as shown below. The color indicates selected trend data respectively. You zoom in to enlarge the scale of the trend to make the reading easier.



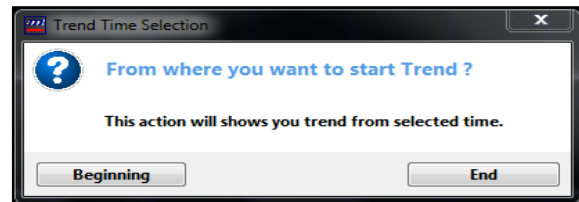
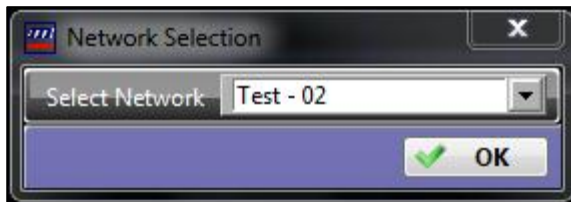
- The trend contains a lot of tools for easy navigation in the chart. You can scroll or use the predefined settings to focus on the time span you want to see.
- You can scroll the x-axis in small or big steps, or use the auto scroll function (center black button) to make the trend chart automatically synchronized and display the latest value of the trend chart series.
- You can zoom in or out on the x-axis, the y-axis, or both axes, or zoom in a specific area of the trend chart, or use the auto range function to automatically adjust the trend chart x-axis and y-axis according to the range of the series displayed. You print a trend chart using the Print function in zoom in trend. Zoom in trend display only historical data.



- Trend will be shown as break when there is no data or error in communication.



- Network trend** - User can directly view trends of previously device networks which was removed from the SMART using this with selectable options to start with last record or to start from beginning. To view trends of an existing network, select it from drop down. Window will appear as shown, select network will pop up options.



- A fixed value line represents a specific value on a graph that is selected by the user and can be changed at any time.
- Minimum, maximum and average values are calculations based on the recorded data for that parameter for selected time only.



6. SMART Report

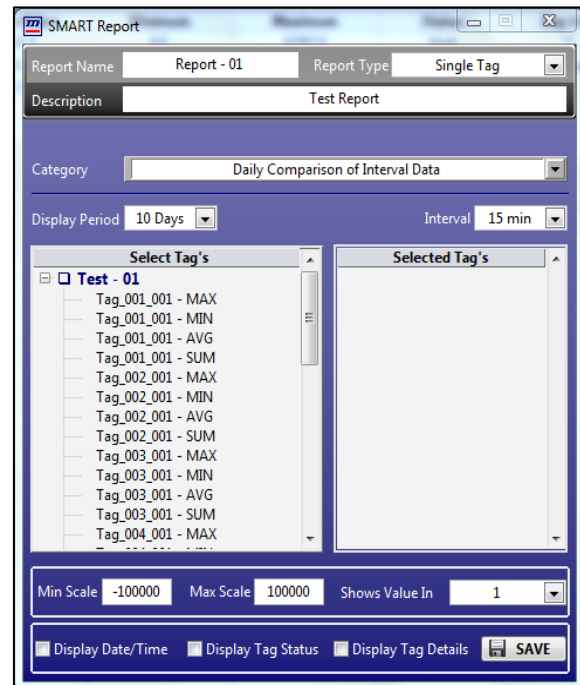
SMART report is used for displaying and reporting archived data. No database server, no SQL programming, no report designer but still you have all those reports. SMART provides two types of reports. These are reports built with archived time-stamped and reports built with archived interval information.

Reports built with archived time-stamped

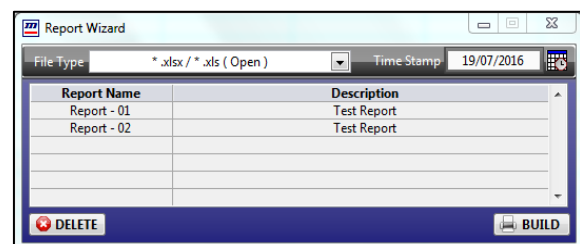
SMART tags such as historical trends. These are similar to reports available in the generic SCADA or HMI applications.

Reports built with archived interval information

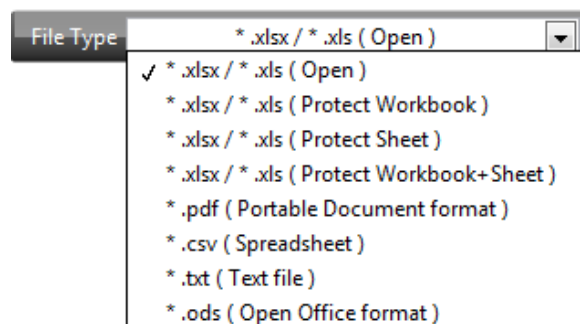
It makes very professional quality reports in textual and excel templates. SMART report screen looks similar to the following. This chapter provides assistance in achieving optimum organization by outlining steps to create, delete or recover reports. Users can create a blank report by this wizard. Give report name and description, select report type whether this report is for single tag or for multiple tags. Select specify display period and interval. Select tags as you can see, the left pane displays the list of all available tags. You can select maximum 48 tags for a multiple tag report. Min scale & max scale fields define the range for displaying the selected parameters. You may specify in what multiple of units the values shall be shown in a report i.e. in multiple of 10, 100, 1000 or 10000. Select all settings as per you need and click SAVE. All saved, reports (*as long as they haven't been permanently deleted*) will be located in report wizard. Selecting the field displays the details of all selected tags in the textual print report.



The report wizard window will pop up as below. You have to select the day at the time of viewing the report. A report can also be renamed while it is opened. The report must be saved after it has been renamed in order for the new name to be applied once the report is closed. A report can be saved to a file or to the internal hard disk.

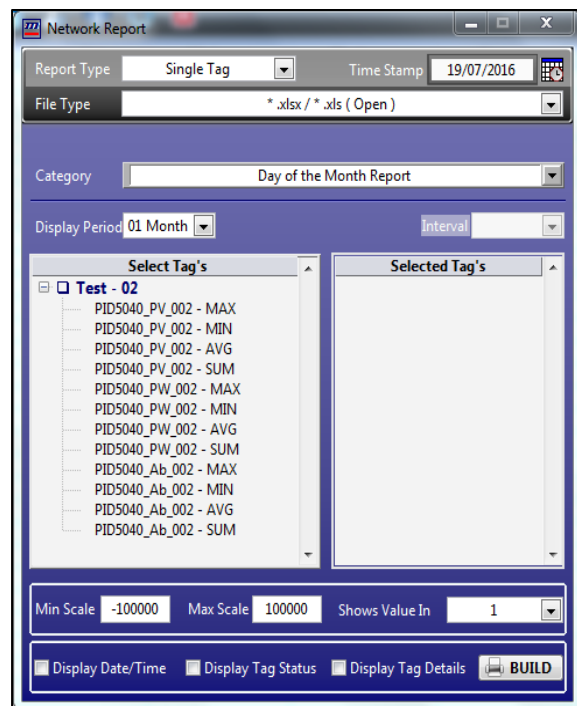
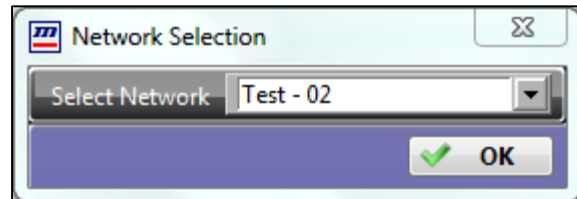


User can create report in many file formats as shown. SMART enables you to create report data to a customized Microsoft Excel™ template file. Excel template files can be used to apply formatting, and to generate summary calculations. Reports can be deleted at any time. Once a report is deleted from the report wizard, it is permanently deleted and cannot be recovered.



File Formats

- **Excel (*.xls / *.xlsx)** - Microsoft Excel has the basic features of all spreadsheets, using a grid of *cells* arranged in numbered *rows* and letter-named *columns* to organize data manipulations like arithmetic operations.
- **Portable Document Format (PDF)** - is a file format used to present documents in a manner independent of software, hardware, and operating systems. Each PDF file encapsulates a complete description of a fixed-layout flat document, including the text, fonts, graphics, and other information needed to display it.
- **Spreadsheet** - is an interactive computer application for organization, analysis and storage of data in tabular form. A spreadsheet consists of a table of *cells* arranged into rows and columns and referred to by the X and Y locations. X locations, the columns, are normally represented by letters, "A", "B", "C", etc., while rows are normally represented by numbers, 1, 2, 3, etc.
- **Text file** - is a kind of computer file that is structured as a sequence of lines of electronic text. Windows use a common text file format, with each line of text separated by a two-character combination: carriage return (CR) and line feed (LF).
- **Open File Format** - open document format for office applications (ODF), also known as open document, here we used filename extensions for documents is *.ods (spreadsheet).
- **Network Report** - User can directly create reports of previously device networks which was removed from the SMART using this. To create reports of an existing network, select it from drop down. Window will appear as shown above. User can directly create report by selecting all parameters and click BUILD in network report wizard.



Simple Reports

These reports are displayed by aggregating base interval data (of same or different intervals) to higher common intervals i.e. 15, 30, 60, 120, 240, 480 or daily/monthly interval.

- **Daily data report**
This report shows the value of the parameters according to the type of tag selected for each day of a week or a month. If you have selected the "Maximum Value during Interval" type tag then the report shows the daily maximum value of the parameter of a week or a month.
- **Interval monthly data report**
This report displays interval wise value of desired parameters for the whole month. The aggregation of data is performed for all intervals for each day of the whole month. The value shown for an interval is the aggregation of data of all corresponding intervals of complete month.
- **Interval data report**
This report displays the interval wise data of the parameters associated to the selected tags for a particular day.

- **Monthly data report**
This report shows the significant value of parameter of a tag for the whole month.
- **Daily comparison of tag data**
This type of report is useful for having a comparative look on the daily data of selected tags. It is used to see the everyday value of the parameter.
- **Monthly comparison of tag data**
This reports displays the monthly values of the tags according to its significance for the number of months selected. You can select 1 to 12 numbers of months for generating the report.
- **Interval wise comparison of tag data**
This report displays the interval wise data summary for the selected tags. It means the tag name in the report is followed by its fetched values based on its significance, falling in each time interval for the selected day. You have to select the day at the time of viewing the report.
- **Interval wise comparison of tag monthly data**
The purpose of this report is to compare the various tags interval wise. This report shows the tag name followed by the values falling in each interval. Here the aggregation of data is performed for all intervals of all days for whole month.
- **Day of the month report (For Single Tag only)**
This report displays the value of a selected single tag as per its significance for each day of the month. You can select 1 – 12 numbers of months for generating this report.
- **Daily Comparison of Interval data (For Single Tag only)**
This report gives the daily comparison of interval data. It means that this report shows you the interval data of each day for the selected number of days. The data depends on the tag selected and the type of its significance like minimum, maximum, average etc. If you select the maximum type of tag then the report shows the maximum value of tag in each time interval of each day for the number of days selected.
- **Monthly Comparison of Interval data (For Single Tag only)**
This report shows the monthly significant value like maximum, minimum, average etc. of the tag for each interval of a day. You can select the interval of 15, 30, 60, 120, 240, 480, 720 and 1440 minutes for 1-12 numbers of months.
- **Daily periodic data report**
This report shows the single day log data for a selected date. User can create this report for single tag as well as multiple tags (up to 48 tags). User have to select only one type from tag display (max, min, avg. or sum) because it will displays total logged records of the day.

7. Software Licensing Agreement

SOFTWARE

Masibus SMART software

LICENSE

Masibus Automation And Instrumentation Pvt. Ltd. ("**Masibus**") grants you a non-exclusive license to use the software listed in the section above ("**software**") if you follow all restrictions in all sections of this agreement.

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- Make a copy of the software for archival purposes, if required.

You may not

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8. Contact Information

For further information described in this manual, please contact at Masibus Automation And Instrumentation Pvt. Ltd. by phone or email:

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