MMS 6850 Software group

Content

MMS 6850 DS (DM)

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Terminology used

Static data – characteristic measured values such as RMS, Peak-Peak, shifts etc., value of the 1st harmonic value, commonly computed as statistic characteristics
Dynamic data – time waveforms, order analysis series and spectra records.
Database – database managed through SQL server (currently Microsoft SQL Server tested only).
Cell, DataCell – data item containing all information about one concrete type of data (RMS,P-P etc.) stored in database; see additional documentation (DDS2000).
Data state, status – software recognizes normal state(status), alert status and danger status; see additional documentation (DDS2000).
TCG, Time Control Group – groups of measured values for whose are defined store intervals; can be fixed (store every time request for store occurs) or controlled by another values and their limits.

Brief description

Online Data Manager (DM) is software for data acquisition from machine monitoring systems (such as Epro MMS). The role of the DM is to assure robust data logging onto SQL server as like as provide intelligent data acquisition management (eg. value-dependent storing). Another functionality DM assures is to server online data on TCP, so second applications (eg.Online Data View) can process these data.

Data Storage

DM uses as a data storage SQL server (Microsoft SQL Server or MSDE), database format is compatible with the DDS2000 and DDS2000 software packages. In rare cases the original database can be converted to more optimized form, so large amount of data can be stored without significant change in access times.

DM is strongly cohered and dependent on DDS2000 software. While DM acts as data logger, almost all of the parametrisation (excluding TCG configuration, see later) is done via DDS2000 software, which acts as a data collecting and managing center.

DM has no limits, DDS2000 has:

- maximum number of static values per cell : 65536
- maximum number of dynamic records per cell : 8192

Reductions

DM also acts as a data reducer/compressor. User can define data reduction parameters in DDS2000 software, DM checks data for changes/duplicities and reduces data as needed. The reduction algorithm has three bands of sensitivity (no reduction, short time reduction, long time reduction), when reduction is evaluated, relative (or absolute) change is evaluated for static data. Dynamic data are at the moment reduced by time preserve only.

All database tasks (data store, reduction, export) are separated from data acquisition in different process thread (they are performed asynchronously), in other words, they do not block measurement of the data whose values are cached internally.

Transient events

DM can also define so called TCG's (Time Control Groups), allowing user to specify different time intervals for storing individual data as like as to specify limit-dependent storing.
User can define limit values in DDS2000 software for each of the measured cell/value pair. If TCG is configured for use of the critical values (limits), DM evaluates relationships between *controlling values* (values determining when other value will be stored) and their limits and as a result comes store of the TCG's assigned values (so-called *contained items*). This feature allows user to save interesting intervals of run-up/down and so on.

To enlarge robustness in data acquisition user can create up to 4 projects running simultaneously on 4 instances of DM. DM uses simple mechanism of startup ini files, where user can define different command line options for each of the DM instance.
Multiinstance can be used in such a way as is use of different databases for static and dynamic data.

Maximum robustness is achieved via special database mode called *Partitioned*, when dynamic data for each of the data cells are stored into *different* physical file, even they still acts as compact database. User is able to convert current database to *partitioned mode* via DDS2000 software.
The performance is pushed up only if there are dynamic data (now only MMS6000 supports this).
Caution: before converting database to partitioned mode we recommend to do the backup of the database. If any problem occurs there's available restore of the database to oroginal state after conversion still withou data-loss.

DM also encapsulates database EXPORTS, whose ensures overflow-free function of DM. Exports are done via ODBC into Access MDB files. User can enable/disable export, limit size of the database leasing to export, time preservation of the online database in the DDS2000 software.

Basic operation

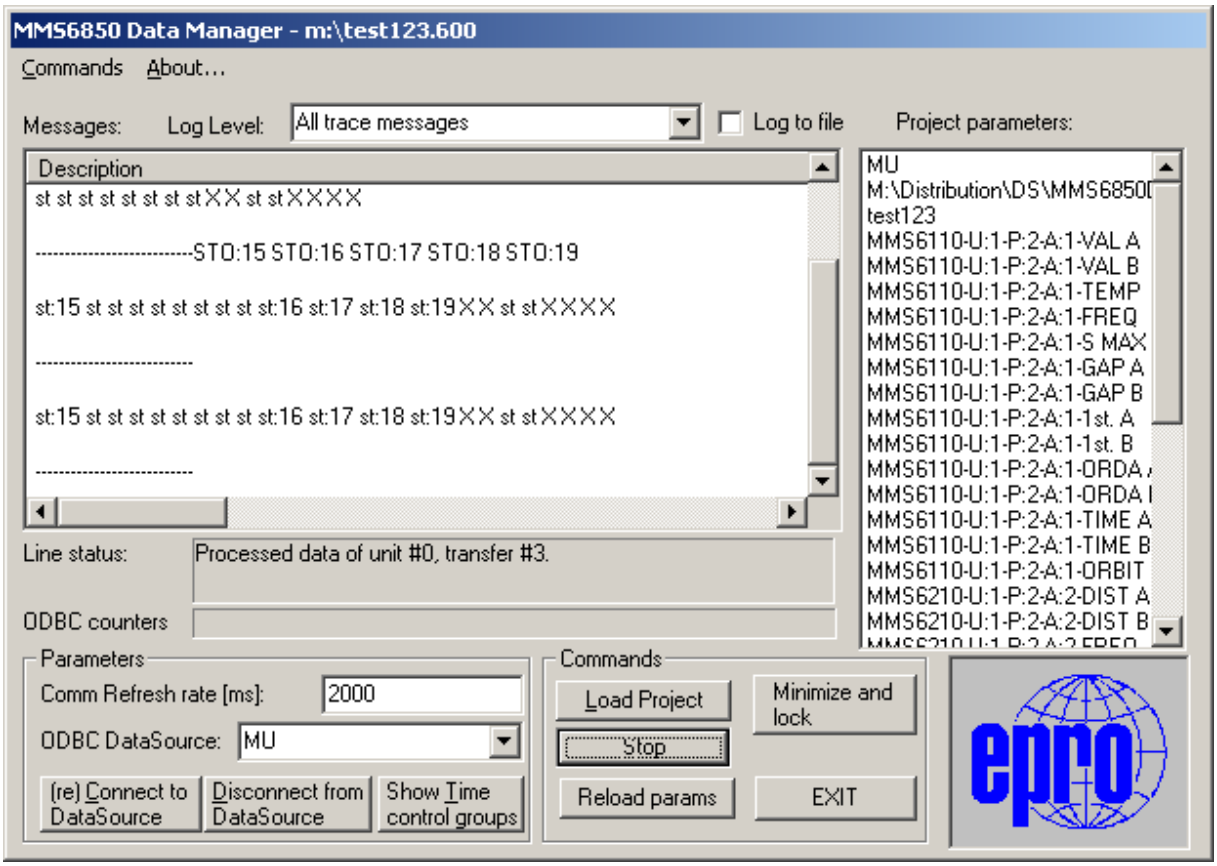


Fig.1. DM window

User have to specify command line options (see later) or run DM standalone and perform actions in this sequence:

1) (optional) select **ODBC Data Source** and press button **Connect to DataSource**.
2) press button **Load project**, select file with “600” extension previously cerated in DDS2000 software and press OK.
3) press button **Receive** to start receiving values from the machine.

Description of the functionality of the user interface

Log Level combo specifies whose messages will be logged to *Messages* window.
Log To File check button enables/disables logging messages to the log file. If enabled, log files are generated into current directory of the application and they have extensions **lg0, lg1**. **lg0** files are actual logs, **lg1** are log files backed up when the log file size exceeds maximum. The maximum is by default 2000 kBytes, user can specify other value in command line.
Comm Refresh rate specifies basic delay between two scans of the machine fot the measured values.

ODBC DataSource combo lists ODBC data sources configured on the PC running DM. User selects apropriate ODBC data source to resp. from which the DM will store resp. read data. More about ODBC can be found in DDS2000 documentation.
Connect to DataSource directs manager to connect to the selected ODBC data source.
Disconnect from DataSource directs manager to disconnect from the currently connected ODBC data source.

Load project directs DM to load *.600 project previously created by DDS2000 software.
Reload Params reloads global parameters of the data reduction and exports from the INI files of the Diagnostic System.
Project Parameters list window shows current loaded configuration-items will be receiving and storing by DM.

Show Time Control Groups invokes TCG configuration dialog (see chapter Time Control Groups)
Minimize and Lock minimizes DM and if there is defined DDS2000 authentication system is locked and user must enter correct username – password pair to maximize and unlock.

Short messages description

Many of the DM messages are in the short form to reduce size of the logs. Here comes the description of the short messages:

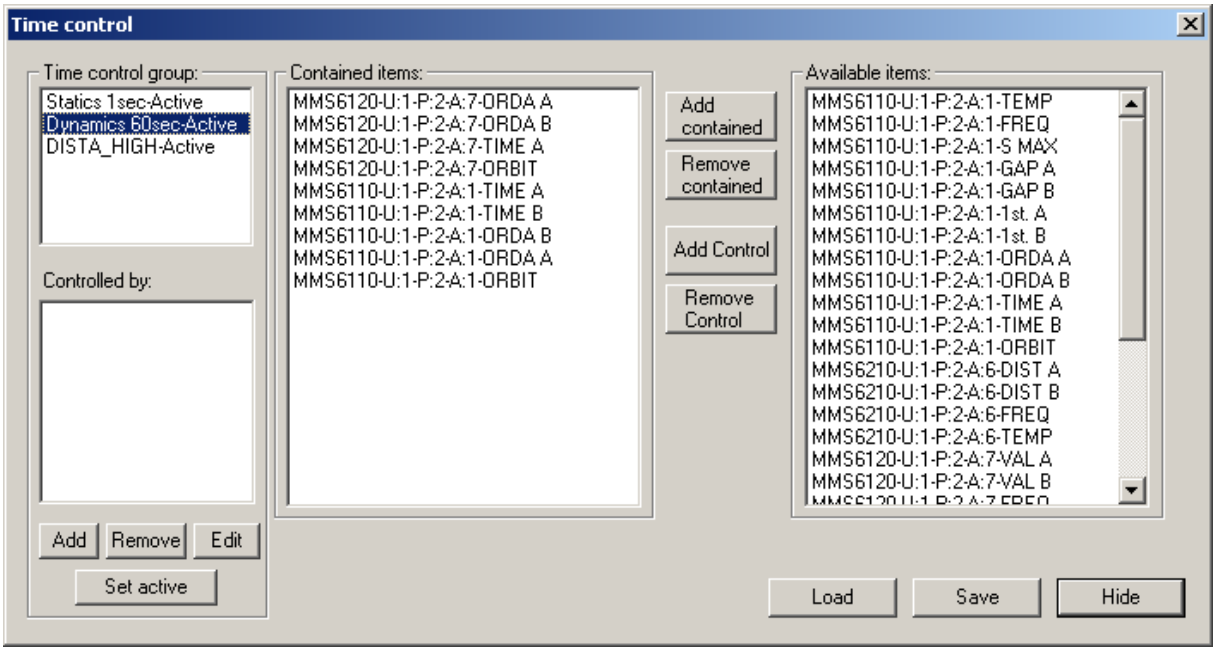
st:xx … static value of data cell number **xx** scanned
STO:xx … static value of data cell number **xx** scanned and stored to database
X or **X:xx** … value not scanned or scanned with bad status (f.e. channel clear missing)
dyn … dynamic data loaded, but corresponding cell not specified in project
DYN:xx … dynamic data scanned and stored to corresponding cell number **xx**
RED:xx … cell **#xx** data read, reduced and stored

Time control groups(TCG)

Time control groups is functionality allowing user to define different behavior of storing data during acquisition.

By default, when loading new project first time, all data items are assigned to be stored each 30 seconds, if they are available from the hardware.

User by clicking **Show time control groups** from within the Manager window invokes TCG configuration dialog.



where user can **add, remove, edit** groups and assign items to them as a *contained items* or as a *controlling items*.
Load and **Save** buttons loads TCGs from the current project resp. saves to the current project (if any loaded).
Button **Set Active** lets user raise TCG to active state. Repeatly pressed button on the same TCG inactivates the selected TCG and so on.
Active state means the group can affect storing of the contained items.

Contained items are those measured values, whose will be affected by the parameters of the TCG (eg.refresh rate) when concrete TCG will be activated by **Set Active** command button.

Controlling items are those measured values, whose actual values will be compared to actual warning and alert levels defined in DDS2000 software. Once the *controlling item* is to be affected by the levels, the TCG will be driven to store *contained* items. The TCG which is to have mentioned functionality must be created of type **Critical Status Change** or **Critical Any Change**.

Critical Status Change TCG will drive contained items to store if controlled item have change in status (f.e. limit levels exceeded). It'll be recorded only the *change* of the status.
Critical Any Change TCG will drive contained items to store if any of the controlled item have change in status from normal to any type of alert or danger. So any over of limits values will be stored.
Status To High (resp.**Status To Low**) TCG will drive contained items to store if any of the controlled item have change in status from higher to lower level of status (resp.from lower to higher level)
Constant Difference TCG is special type designed to watch frequency changes. If some frequency data cell has defined relative change limits in absolute level and this data cell is selected as controlled item and contained item, any change abou defined level will drive all contained items to store. User can monitor by this way constant difference steps in frequency, which can be usefull when monitoring eg. run ups.

While **Critical Status Change** TCG is useful for capturing *changes in status* during transient effects in characteristic values, **Critical Any Change** TCG will capture all values beyond normal status (not only values in *moments* of changes in status).

Watchdog operation

DataManager supplies application **watchdog.exe**, which is used when command line parameter "-WATC:" is used.
Watchdog watches every 60 seconds (the period is adjustable form the DM command line by -WPAU option) normal response of the DataManager aplication (mechanism used is DataManager response to the defined Windows message).
When the watchdog determines the DataManager is not responding he restarts DataManager and close self. The timeout is 20 seconds by default, adjustable by -WTST command line option. So one cycle of the crash protection is done.
If the user wants to protect DataManager against unconventional behavior continuously, it is needed to write startup ini file **6850DM.INI** and specify in command line parameter **-WATCH:watchdog.exe**. This is standard scenario for use of the software watchdog application.
For examples see section ***Startup Ini Files***.

Command line options

-ODBC:**DSN**
specify **DSN** defined in ODBC sources will be opened
-PROJ:**path**
load project from location **path**
-RUN:Y
directs DM to start refreshing
-REFRESH:**interval**
sets refresh rate of the manager to value of **interval** in miliseconds
-PORT:**port**
TCP server of the DM will be running at this network port number
-LG:**lgsize**
Enables logging to the log files ***.lg0**, **lgsize** specifies maximum size in kilobytes of the log file. When the maximum size is exceeded *.lg0 log file is backed up into file *.lg1.
-WAT:**watchdog_application**
Path to the watchdog application, relative or absolute, default **-WATCH:watchdog.exe** is correct.
-WTST:**testtime**
Watchdog test time in seconds. Watchdog will wait **testtime** seconds for DataManager response than he restarts DataManager.
-WPAU:**sleeptime**
Watchdog sleep time. Watchdog will sleep **sleeptime** seconds between two tests.
-OPT:**value**
this option has meaning of bitwise swicth, so each option has power of 2 value and whole number is result of bitwise OR of the options. Options are:
2 - end DM without user interface when run with duplicate project specified in command line - specify this option when using 2 or more instances of the DM run from startup ini and protected by watchdog.

Global parameters of data reduction

When you edit *.600 project file in DDS2000, during save is stored also path to DDS2000 ini file, which contains global parameters of the data reduction.
The default data reduction values are:

- **Short time reduction** is not active
- **Long time reduction:**
  - Statics
    - Not reduced for 7 days
    - Needed relative change 20%
    - Minimum interval between two reduced records 1 hour
  - Time waveforms and Order analysis waveforms
    - Not reduced for 2 days
    - Minimum interval between two reduced records 2 hours
  - Spectra
    - Not reduced for 2 days
    - Minimum interval between two reduced records 2 hours

Reasons for reduction need

Please, take a while to understand the data reduction mechanism described in DDS2000 manual. It is not problem of the DM software but DDS2000.

For example, if DM let standalone acquiring data 22 days each 30 secs., database will overflow 64000 records of the static data, so no more records can be effectively maintained by DDS2000 software. Due to this you have to set up some reduction, even weak (f.e.20% of change, data not reduced 7 days).
User have not to be afraid, data reduction is very safe due to the data analysis. Significant changes asre not lost, so only effective part of the measurement is acquired and stored.

Also be careful about dynamic data (time waveforms and order analyse data), if your hardware support it. There's data reduction mechanism in th DM too, export mechanism allows you to export part of the database if the size is growing significantly.

Startup Ini files

User have otion to run up to 12 instances of the DDS2000DM or DDS2000V (or, if specified, other applications). For both applications can exist file **DM.INI** resp **DV.INI**. When corresponding file exists and there are found following sections and lines in the file

[Run_1]
[Exe=FullPathToExeFile]
CmdLine=application command line
Delay=1000
…
[Run_12]
[Exe=FullPathToExeFile]
CmdLine=application command line
Delay=2000

the corresponding application instance will be created. If there's only **[Run_1]** section, current instance of the application will be started with command line specified. **Delay** parametr specifies delay that will be applied after run of the instance. This parametr can be used for optimizing start sequences.

If the parameter **EXE** is specified as full path to application, not **DM or V** will be started but the application specified. This allows user to construct one INI startup file for all of the applications, f.e **DM.INI**:

```
[Run_1]
CmdLine=-PROJ:c:\projects\plant.600 –REFRESH:10000 –RUN:Y -WAT:watchdog.exe
-WTST:30 -WPAU:60 -OPT:2

[Run_2]
CmdLine=-PROJ:c:\projects\planttransient.600 –REFRESH:1000 –RUN:Y -
WAT:watchdog.exe -WTST:30 -WPAU:60 -OPT:2
```

This example INI file runs at first requester and TCP/IP server for MMS devices.
At `[Run_1]` the delay is specified to 10 seconds to leave requester/server pair initialize. Next, at `[Run_2]`, no exe is specified and because this is 6850DM.INI file the 6850DM.EXE will be started with parameters specified. "-WATCH:watchdog.exe" runs watchdog application with 30 seconds test time and 60 seconds pause between tests of the DataManager response. `"-OPT:2"` prevents from running same projects multiple times when watchdog restarts application
At last 2 steps viewer and diagnostic system is started.

MMS 6850 V (DV)

v. 2.00.003

Brief description

Online Data View (DV) software is used with conjunction with Online Data Manager software for visualising characteristic values, simple to use but powerfull client software for DM server application. DV enables local visualizing as like as distributed network visualizing of the acquired characteristic values, complexity of the DV grows from the start of use to epxert use, so new user (designer) is not concerned with high starting complexity of the application - 2 mouse clicks are needed to start visualizing.

DV consists from the **Tree** of data items (so called *schema items*) whose can be visualised (left side of the DV window), from **Desktop** containing **Panels -** visualising views - and from the **toolbar** and **menu bar**.

DV enables user to connect to running DM and create projects containing multiple visualised panels. Each of the panel can contain technical scheme as a background and visualised characteristic values (data items) as bargraphs or values only.

DV has two modes of operation, Design mode and Runtime mode. The runtime mode is different from design in possibility of fullscreen mode with design mode lock and with only right view visible – DV also supports authentication management support with 3 levels of security.

User enables/disables visualizing of the data item by double clicking item in the tree. The clicked data item is visualised in **active panel**. Active panel is signaled by asterisk in the caption of the active panel window. Certain actions decribed below are referenced to the active panel.
Such a way of the creating projects is very simple, designer have no inner knowledge about visualization mechanism and there's no way how to do the things wrong.

Positioning of the graphs is done via dragging item window appeared after double clicking item in the tree as like as exact positioning from the properties of the graph.

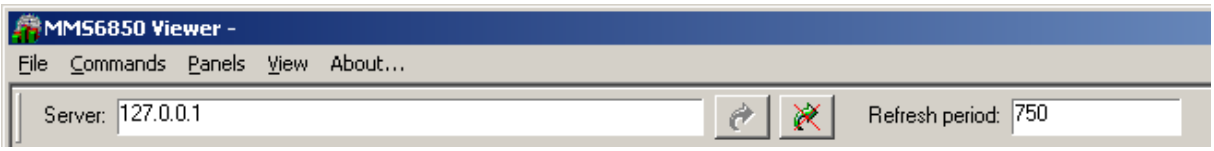
Basic operation

Toolbar description

Icon in the tree means the item is to be refreshed.

Icon in the tree means the item is not refreshed.

Button in the toolbar starts refreshing from the DM at IP address from the edit field in the toolbar ***Server***. If there could be more instances of the ODC running on the targer ***Server***, port can be specified in the command line of the DDS2000V.



Toolbar and menu bar of the DDS2000V

Creating New project

- First of all, designer must start OnlineData Manager application with valid project. See DM description and DDS2000 manual for details how to create hardware project.
- When DM is started, designed enters DM running machine TCP/IP address in the field ***Server*** of the toolbar of the DV.
- Designer have to press the button to start comunicating with DM (Server)
- If communication is succesfull, tree window have to be filled with schema items description
- Double clicking concrete schema item the visualizing window of the item will be shown at the active panel, refresh of the value is done automatically each 750 ms.
- Designer can now create new panels or position each of the window separatelly. More details can be specified in the ***Graph Properties*** dialog invoked from right mouse button menu from the schema item tree (se below)

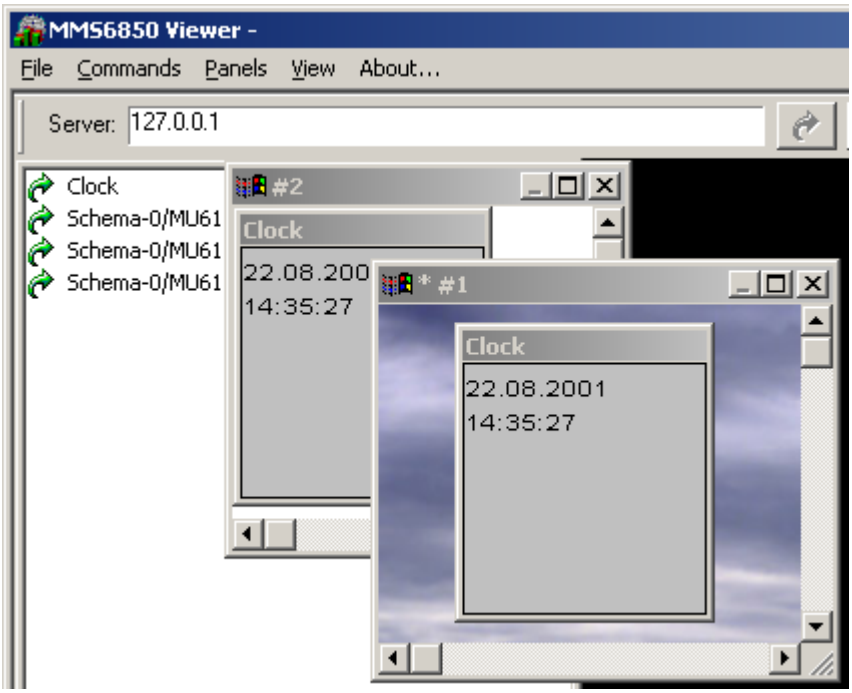


Fig.2. DDS2000V with two views, "#1" view is active (with asterisk)

Menu commands

File/Save … stores actual state of DV into ***.viw** file
File/Load … loads previously stored ***.viw** file and reestablishes stored connection
File/Close … closes currently open ***.viw** file, connection to DM and frees all data and windows.

Commands/Full screen … toggles fullscreen mode. Once DV is in fullscreen mode, right click of the mouse button will bring another popup menu with ***Save*** and ***e Full Screen Back*** options.

Command/Refresh Tree … when the project is loaded only items currently refreshing from server are showed in the tree. This command allows user to see all possible items so later redesign of the project is possible.
Commands/Authentication management … runs authentication dialog where administrator of the application can define users with desired access rights.
Commands/Log on as different user … invoke authentication dialog and if the user eneterd is defined logs another user into system
Commands/Logoff current user … logout current logged user from the system, system is totally blocked against any action

Panels / New … creates new panel with desired name.
Panels / ActivePanel / Rename… renames active(selected) panel
Panels / ActivePanel / Background picture … allows user to select **jpeg** file of the background of the active(selected) panel
Panels / ActivePanel / Transparent background … direct DV to visualize graphs as transparent (no window border is displayed)
Panels / ActivePanel / Print panel … allows user to print current **visible part** of the panel. More detailed specification (fit to page, centered print and scale) is available after selecting printer.
Panels / Tile, Cascade … the command positions panels

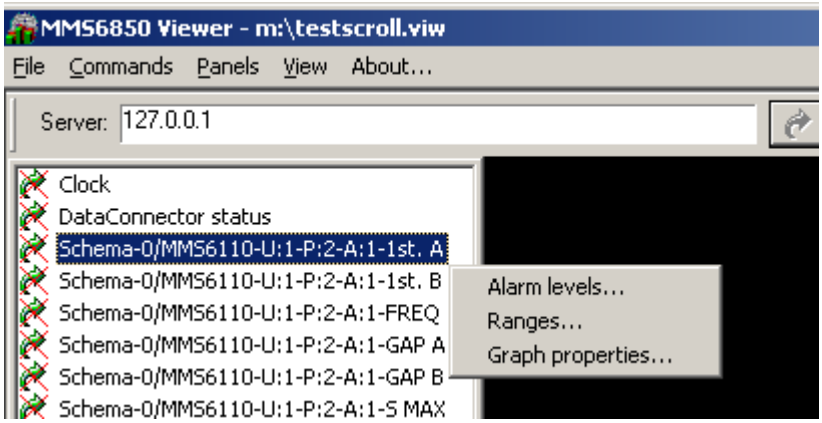
All visible panels are displayed under *Panels* menu as menu items with the names of the panels also. Clicking the item will bring the clicked panel active and to the top.
Panel1 – Panelx … enables user to switch to other panels; user can switch between panels by keystrokes F1-F12

View / Left Panel (Tree) … design mode will be still on, but left view (tree) will disappear or reappear.
View / Toolbar … toolbar will disappear or reappear.

In fullscreen – click right mouse buton :
Full Screen Back … flashes off the fullscreen mode
Save … saves current project with fullscreen set on
Save As … saves current project with fullscreen set on under different filename
Print … shows print dialog; allows user to print fullscreen version of the panel
Panel1 – Panelx … enables user to switch to other panels; user can switch between panels by keystrokes F1-F12
App1 – App12
There can popups items labeled by LBL parameter of the command line in the popup menu, if more than one viewer was run from the startup INI file. By this items of the menu user can switch between viewers in FullScreen mode. If nolabel was specified, the filename is used. If there's no file loaded, the words **Viewer-1**,**Viewer-2** … are used.
User can switch between viewers in FullScreen mode by keystrokes Ctrl+F1-Ctrl+F12 also.

Tree commands

User have to right click mouse button on the listed item in the Tree panel:



Tree menu after right mouse button click on the item

Alarm levels … allows set different alarm levels than loaded from monitoring system (MMS)
Ranges … allows set different axis ranges than loaded from monitoring system (MMS)
Grapg properties … allows set visibility of the graph parts and position of the graph.

Graph items (windows)

When user starts to work with DV and makes a connection to the server by list of data items is displayed. There are items **Clock** and **DataConnector** in the list also. These items have informational purpose of display of current time and communication line object status.

Security

When applied, different users with different levels of the user rights can be defined in the security system.

There are 3 significant security levels for the DV:

1. Administrator - can do everything
2. Power user – can only close the application or load projects
3. Passive user – can only switch from fullscreen to desktop mode and back, can't even close application or panels

Special case of the security situation occurs where loading project from the command line and the project is saved as fullscreen. Then, no user is logged into DV security system and when trying to

switch back to the desktop mode of the application even Passive user must log into system. In other words, system is totally blocked until user is not logged in.

In fullscreen all windows function keys like Alt+Tab, Ctrl+Esc are blocked and Ctrl+Alt+Del combination will invoke authentication dialog.

Useful Notes

Here we will add useful notes on the application use.

- FULSCREEN – when applied security, user must be logged to switch back
- CONNECTION - if lost, every 15 secs. DV trying to reconnect

DV Command line options

-PROJ:**path**
load project from location **path**
-PORT:**port**
connect to the specified port at the server.
-LBL:**label**
the application label; this label is used f.e. when identifying more running instances of the DV