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1. INTRODUCTION

1.1 Purpose

The purpose of this document is to communicate to the device manufacturers what EDDL features will and will not be supported in the releases of AMS Device Manager.

1.2 Intended Audience

This document is targeted at HART and Foundation fieldbus device developers that are familiar with the EDDL language, including the enhancements that have been recently introduced (charts, graphs, grids, images, files, lists, and so on).

1.3 Terminology

The term “silently ignored” means that the feature will not be used by AMS Device Manager, but specifying the feature in an EDD file will have no adverse affect on these products.

1.4 Revision History

Rev.	Date	Modifier	Description
1.0	8-Sep-2005	Jon Westbrock	Initial revision.
1.1	8-Nov-2005	Jon Westbrock	Conditional menu items not supported.
1.2	14-Nov-2005	Jon Westbrock	Validity on AXIS on longer supported by HCF. Init and exit action on a SOURCE are only supported by FF, for the time being.
1.3	Feb 8 2006	Walter Sigtermans	Auto-Scaling of Y Axis now works for Graphs/Charts for both AMS Device Manager and 375 for FF devices.
1.4	March 14, 2006	Daniel E. Vande Vusse	Added new bit enumerated display behavior.
1.5	Feb 22 2007	Walter Sigtermans	Documented functionality that has been added since AMS Device Manager 7.6
1.6	May 31, 2007	Daniel E. Vande Vusse	Remove 375 from the document as they have creating their own document, TP 205.
1.7	Dec 4, 2008	Walter Sigtermans	Documented functionality that was added with AMS Device Manager 10.0
1.8	Oct 29, 2009	Walter Sigtermans	Documented functionality that was added with AMS Device Manager 10.5
1.9	Oct 1, 2009	Walter Sigtermans	Documented functionality that was added with AMS Device Manager 11.1

1.10	Mar 11, 2010	Walter Sigtermans	Documented functionality that was added with AMS Device Manager 11.5
1.11	July 6, 2011	Walter Sigtermans	Updates as per feedback from Thomas Kirner
1.12	Oct 23, 2012	Walter Sigtermans	Documented functionality that was added with AMS Device Manager 12.0
1.13	Mar 26, 2015	David Pearce	Documented functionality that was added with AMS Device Manager 13.0

2. VARIABLES

Attribute	AMS Device Manager
DEFAULT_VALUE	Supported AMS Device Manager version 11.0
REFRESH_ACTIONS	Supported AMS Device Manager version 11.5
CLASS LOCAL	Supported

2.1 Default Value

The DEFAULT_VALUE attribute was silently ignored by AMS Device Manager before version 11.0.

2.2 Refresh Actions

The REFRESH_ACTIONS attribute was ignored by AMS Device Manager before version 11.5.

2.3 Local Variables

In addition to the definitions already specified for the CLASS attribute, Foundation fieldbus has added support for LOCAL. This has been supported by the HART Foundation for quite a while now.

AMS Device Manager will determine the local variables in a Foundation fieldbus device via the LOCAL_PARAMETERS attribute of a block. AMS Device Manager will not rely on the LOCAL class specifier being specified on local variables. In other words, the LOCAL class specifier will be silently ignored.

3. VALUE ARRAYS

Attribute	AMS Device Manager
LABEL	Supported
HELP	Supported
TYPE	Supported
NUMBER_OF_ELEMENTS	Supported
RESPONSE_CODES	Supported – FF only

Value arrays, or arrays as they are called by FF, will be supported as they are in the currently released products. Support for value arrays in HART devices is not officially supported, and then only for local variables and ONLY with the Version 8 tokenizer (fm8 dd files).

Value Arrays used by	AMS Device Manager
Menu	Supported – FF only
Method	Supported – HART and FF
Waveform	Supported – HART and FF
Grid-Vector	Supported – HART and FF

4. BLOCKS

Attribute	AMS Device Manager
AXIS_ITEMS	Supported
CHART_ITEMS	Supported
FILE_ITEMS	Supported AMS Device Manager 11.5 (HART and FF)
GRAPH_ITEMS	Supported
GRID_ITEMS	Supported
IMAGE_ITEMS	Supported
LIST_ITEMS	Supported AMS Device Manager 11.5 (CLASS LOCAL) for HART and FF
LOCAL_PARAMETERS	Supported
SOURCE_ITEMS	Supported
WAVEFORM_ITEMS	Supported

4.1 FILE_ITEMS

Files (In HART and FF) are supported in AMS Device Manager 11.5.

4.2 LIST_ITEMS

CLASS LOCAL Lists are supported (for HART and FF) in AMS Device Manager 11.5.

4.3 LOCAL_PARAMETERS

Local parameters are parameters that are specified in the EDD but are not stored within the field device.

5. MENUS

Attribute	AMS Device Manager
LABEL	Supported
HELP	Supported
ITEMS	Supported
STYLE	Supported
VALIDITY	Supported – HART only

Menu Item Qualifier	AMS Device Manager
REVIEW	N/A
DISPLAY_VALUE	N/A
READ_ONLY	Supported
NO_LABEL	Supported
NO_UNIT	Supported
INLINE	Supported
COLUMNBREAK	Supported
ROWBREAK	Supported

5.1 Items

AMS Device Manager will use the process_variables_root_menu, diagnostics_root_menu, and device_root_menu as the basis of the user interface for the device.

Conditional menu items, as defined by the HART Foundation, will not be supported. The inclusion of individual bits of a bit enumerated variable on menu will be supported. The inclusion of collections on a menu will not be supported.

5.2 Style

AMS Device Manager will convert menus of style PAGE into a tabbed dialog, and will convert menus of style GROUP into group boxes.

AMS Device Manager makes no distinction between menus of style WINDOW and menus of style DIALOG.

AMS Device Manager will silently ignore any menu of style TABLE.

5.3 Read_Only

AMS Device Manager has a special display options for bit enumerated variables. The format of the displayed bit is dependant on the variable handling, which root menu it is part of, and the use of the READ_ONLY menu item qualifier

Display styles

Bulb – Light bulb with text to the right that is un-affected by bit state.

Alert Bulb – A light bulb with text to the right that changes background alert color when bit enabled.

Check Box – A standard read write checkbox. Bit status is indicated with a check. Background of box is white. User can change state.

Grayed Check Box – A standard read only checkbox. Bit status is indicated with a check. Background of box is gray. User can not change state.

Display Option Table.

Variable Handling	READ_ONLY Menu Modifier	Status Pages Bit Enumerated Display Format.	All Other Pages Bit Enumerated Display Format.
Read	Not used	Grayed Check Box	Grayed Check Box
Read	Used	Alert Bulb	Bulb
Read / Write	Not Used	Check Box	Check Box
Read / Write	Used	Alert Bulb	Bulb

6. METHODS

Attribute	AMS Device Manager
TYPE	Not Supported

Built-in Function	AMS Device Manager
ListDeleteElementAt	Supported – HART and FF
ListInsert	Supported – HART and FF
Menu	Supported – HART and FF
MenuDisplay	Supported – HART and FF

The Fieldbus Method interpreter has been updated to support the builtins required for crossblock functionality.

There are now two HART method interpreters. The legacy method interpreter which has been tested with 400 HART devices, and a second generation method interpreter which supports:
a. The new math and string builtins
b. Methods calling methods
c. direct referencing of variables.

7. CHARTS

Attribute	AMS Device Manager
LABEL	Supported
HELP	Supported
HEIGHT	Supported
WIDTH	Supported
MEMBERS	Supported
CYCLE_TIME	Supported
LENGTH	Supported
TYPE	Supported
VALIDITY	Supported – HART only

7.1 HEIGHT and WIDTH

Supported.

7.2 MEMBERS

375 Field Communicator will provide a combo box that may be used to select a specific source on the chart. The selected source will be highlighted and the Y axis will correspond to the selected source.

AMS Device Manager will display a legend that may be used to distinguish between the various sources being displayed by the chart.

The description and help strings will be silently ignored.

7.3 CYCLE_TIME

The CYCLE_TIME attribute specifies how often the chart is updated. The rate at which data is read from the field device may be different than the rate at which the chart is updated.

7.4 TYPE

For AMS Device Manager, the behavior of SWEEP charts will be the same as the behavior of SCOPE charts. The behavior of these charts will follow the definition of SCOPE charts defined in the EDDL specifications.

7.5 Zooming and Panning

Zooming and panning will be supported on STRIP charts only.

7.6 Referencing Attributes of a CHART

Referencing the VIEW_MAX and VIEW_MIN of a CHART is not supported. In other words, the following will generate a possibly unrecoverable error.

```
name_of_chart.X_AXIS.VIEW_MAX
```

8. SOURCES

Attribute	AMS Device Manager
HELP	Supported
LABEL	Supported
EMPHASIS	Supported
LINE_COLOR	Supported
LINE_TYPE	Supported
MEMBERS	Supported
VALIDITY	Supported – HART only
Y_AXIS	Supported
INIT_ACTIONS	Supported
REFRESH_ACTIONS	Supported
EXIT_ACTIONS	Supported

8.1 MEMBERS

The description and help strings will be silently ignored.

8.2 VALIDITY

When a source is invalid, it will be displayed.

8.3 Y_AXIS

While the EDDL specifications indicate that this is optional, AMS Device Manager does not require that this be defined for EDDLs.

8.4 INIT_ACTIONS and EXIT ACTIONS

While these actions are supported, these methods may only make use of the capabilities of the existing method interpreter, including the built-in functions supported by the existing method interpreter.

9. GRAPHS

Attribute	AMS Device Manager
LABEL	Supported
HELP	Supported
HEIGHT	Supported
WIDTH	Supported
MEMBERS	Supported
VALIDITY	Supported – HART only
X_AXIS	Supported

9.1 MEMBERS

AMS Device Manager will display a legend that may be used to distinguish between the various waveforms being displayed by the graph.

The description and help strings will be silently ignored.

9.2 X_AXIS

While the EDDL specifications indicate that this is optional, the 375 and AMS Device Manager will require that this be defined.

9.3 Zooming and Panning

Application-driven zooming and panning will be supported. However, support for DD-driven zooming and panning though the use of VIEW_MIN, VIEW_MAX, and REFRESH_ACTIONS will not be supported.

9.4 Referencing Attributes of a GRAPH

Referencing the VIEW_MAX and VIEW_MIN of a CHART is not supported. In other words, the following will generate a possibly unrecoverable error.

```
name_of_graph.X_AXIS.VIEW_MAX
```

10. WAVEFORMS

Attribute	AMS Device Manager
LABEL	Supported
HELP	Supported
EMPHASIS	Supported
HANDLING	Not Supported
KEY_POINTS	Supported
LINE_COLOR	Supported
LINE_TYPE	Supported
TYPE	Supported
Y_AXIS	Supported
INIT_ACTIONS	Supported
REFRESH_ACTIONS	Supported
EXIT_ACTIONS	Supported

10.1 HANDLING

Editing waveforms is not supported. However, is a subsequent release we intend to support editing waveforms via an interface very similar to a GRID.

10.2 TYPE

Waveform data is expected to be static. If dynamic variables are used with a waveform, they will be read only once. In other words, graphs do not update dynamically.

10.3 Y_AXIS

This is optional for AMS Device Manager.

10.4 INIT_ACTIONS and EXIT ACTIONS

While these actions are supported, these methods may only make use of the capabilities of the existing method interpreter, including the built-in functions supported by the existing method interpreter.

11. AXES

Attribute	AMS Device Manager
LABEL	Supported
HELP	Supported
MIN_VALUE	Supported
MAX_VALUE	Supported
VIEW_MIN	Not Supported
VIEW_MAX	Not Supported
SCALING	Supported
CONSTANT_UNIT	Supported
VALIDITY	Not Supported

11.1 MIN_VALUE and MAX_VALUE

Optional

11.2 CONSTANT_UNIT

In cases where the unit of the axis is not constant, AMS Device Manager will support having the AXIS specified as the dependent part of a unit relation.

12. GRIDS

Attribute	AMS Device Manager
LABEL	Supported
HELP	Supported
HEIGHT	Supported
WIDTH	Supported
ORIENTATION	Supported
VECTORS	Supported
VALIDITY	Supported

12.1 VECTORS

Scrollbars will be added to the grid when the data within the grid exceeds a specific threshold.

13. IMAGES

Attribute	AMS Device Manager
LABEL	Supported
HELP	Supported
PATH	Supported
LINK	Supported
VALIDITY	Supported

13.1 PATH

This may be conditional so that different images may be used depending on the value of a local or device parameter.

14. STRING LITERALS

Attribute	AMS Device Manager
ZZ country code	N/A

This does not apply to AMS Device Manager since it will always use the long version of any string defined in an EDD.

15. FILES

Attribute	AMS Device Manager
LABEL	Not Supported
HELP	Not Supported
MEMBERS	Not Supported

Files are not supported. While the definition of files will be silently ignored, any references to a file or to a member of a file will generate an error, which may or may not prevent the product from continuing to function properly.

For example,

```
FILE my_file
{
        MEMBERS
        {
                XVALS, xvals;
                YVALS, yvals;
                NUMPTS, numpts;
        }
}
```

will be silently ignored.

However,

```
WAVEFORM my_waveform
{
        TYPE XY
        {
                X_VALUES { my_file.XVALS }
                Y_VALUES { my_file..YVALS }
                NUMBER_OF_POINTS my_file.NUMPTS;
        }
}
```

will generate an error.

16. LISTS

Attribute	AMS Device Manager
LABEL	Supported
HELP	Supported
TYPE	Supported
COUNT	Supported
CAPACITY	Supported

Lists are not supported. While the definition of lists will be silently ignored, any references to a list or to a member of a list will generate an error, which may or may not prevent the product from continuing to function properly.

For example,

```
LIST x_values_list
{
        CAPACITY 20;
        TYPE x_value;
}
```

will be silently ignored.

However,

```
WAVEFORM my_waveform
{
        TYPE XY
        {
                X_VALUES { x_values_list }
                Y_VALUES { y_values_list }
                NUMBER_OF_POINTS 20;
        }
}
```

will generate an error.

17. COLLECTIONS

Attribute	AMS Device Manager
Heterogeneous ITEMS	Supported

Collections containing items of varying types has been defined so that they may be used for effectively within the definition of the file.

18. EDIT DISPLAYS

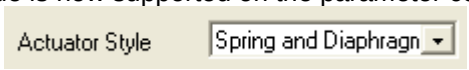
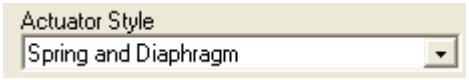
Attribute	AMS Device Manager
LABEL	Supported
EDIT_ITEMS	Supported
DISPLAY_ITEMS	Supported
PRE_EDIT_ACTIONS	Supported
POST_EDIT_ACTIONS	Supported

Edit display support was added in AMS Device Manager 11.5 to support existing legacy HART devices.

19. UPDATES TO EDDL SUPPORT IN AMS DEVICE MANAGER

Version	Change
8.0	Menu Style defaulting was corrected. Previously if “Style” was not set on a menu the parameters below that menu were lost. After this change all menus, charts, parameters and methods are visible regardless of whether the user defined “Style”
9.0	We added offline support for EDDL devices. A HART EDDL device could now have the timer control set to “Offline”
9.0	Embedded Icons work for all EDDL devices (HART and FF). If the user adds an image named “device_icon” as either a gif, jpg, or png AMS Device Manager will use this as the icon to represent the device in the browsers.
9.0	Installation of a device type using only an “FM6” file and a “SYM” file. AMS Device Manager ddinstall program has been modified to handle the install of a devicetype with the minimum files.
9.0	Word Wrapping. AMS Device Manager will word wrap the labels of variable parameters if the horizontal space is insufficient.
9.0	Floating point tick marks are not hard coded to 6 places of resolution to the right of the decimal point. Instead they are hard coded to 4 places of resolution total i.e. 1000; 100.0; 10.00; 1.000. This makes the gauge look less cluttered.
9.5	Increased number of parameter controls per page from 100 to 200.
10.0	Future Devices, Templates, and DeltaV-Placeholders are now supported in EDDL. Previously, if a user accessed a Future EDDL device, AMS Device

	Manager would use the Resource screen to display the configuration.
10.0	275 and 375 configurations are now supported in EDDL. Previously if a user accessed a 275 or 375 configuration, AMS Device Manager would use the Resource screen to display the configuration.
10.0	EDDL based compare screens are now supported. Previously, AMS Device Manager would use the configure resource to build a compare screen. AMS device manager will now use the device_root_menu to build a set of compare screens. The device developer has the option to change the starting menu to build this compare screen. They also have the ability to force AMS Device Manager to continue using the resource file to build the compare screen.
10.0	Installation of a device type using only an “FM6” or an “FM8” file. AMS Device Manager ddinstall program has been modified to handle the install of a device type with the minimum files. If no sym file exists it will create one from information embedded in the “FM6” or “FM8”
10.0	Forward Compatibility is now supported for EDDL devices. This includes the little forward compatibility arrow on embedded icons.
10.0	The Critical Parameter list is now supported from the DD. If a Critical Parameter wizard is necessary (for 275/375) it is generated on the fly, and not required from a resource file. The Device Developer still has the ability to define the Critical Parameter list in the resource file and override the Critical Parameter list generated by the HART Tokenizer.
10.0	Pre and Post Commit methods are now supported without using the resource file. AMS Device Manager uses the same mechanism to determine pre-post commit methods that is used by the 275 and 375
10.0	Edit Displays are now supported (caveat: AMS Device Manager still does NOT support the Pre-Edit and Post-Edit methods of an Edit Display – so Edit Displays are not quite fully supported).
10.0	Cross Revision compare is now supported for EDDL devices.
10.0	Generic Exports now displays information based on the EDDL layout if it is available.
10.0	Enhanced Device help (the “More” button) is now available on a parameter-by-parameter basis for EDDL devices. Previously, this feature was only available on Resource files, when it was enabled for EDDL, it enabled the “More” button for ALL parameters whether they had Enhanced help or NOT. We also now support launching in context for PDF files.
10.0	TABLE layout is now supported. Although there is still some dispute with the HCF as to whether we are doing it right (HCF contends that graphs, charts and images should be displayed in virtual window buttons). We have also referred to this as HandHeldLayout rules.
10.0	“Transfer All” now works for EDDL compare screens (although this is considered a “Transfer Multiple” in certain situations). We also ensured that the “factory protection array” and “loop warning array” function the same for EDDL devices as they did for NON-EDDL devices.
10.0	Image Links are now supported for both HART and FF.

10.0	TIME_VALUE is now supported for HART
10.0	Eight Byte Integers are now supported for HART
10.0	Method Buttons and Window Buttons are now wider to allow more text to fit in the buttons before they word-wrap.
10.0	Label-over-Value is now supported on the parameter control for EDDL devices. Changing this:  to this:  At the same time we increased the “unit area” of the parameter control (not needed on enumerations) so that larger unit names (like: “InH2O @ 68 degF”) do not get truncated. This feature has an override to turn this off for some Legacy EDDL devices.
10.0	Variable column width is now supported for EDDL devices. This means that if there are only 1 or 2 columns of EDDL constructs between each row-break of a page, AMS Device Manager will use a wide column size. If there are 3 or more columns of EDDL constructs between each row-break of a page, AMS Device Manager will use a narrow column size. There is no device.ini file override to turn this feature off
10.0	Enhanced HART Method Interpreter – This supports the math, string, and date builtins. It also supports the MenuDisplay and Menu() builtins. It supports direct referencing. It supports methods-calling-methods with arguments. It supports the TIME_VALUE and it has preliminary support for UTF-8 (WARNING: until the HART Server is converted to Unicode, the preliminary UTF-8 support BREAKS any characters that are above 0x7F (i.e. German characters such as ß, ü, or ö)).
10.0	FF Method Interpreter supports new builtins – This has added only those builtins required to support “Cross-Block”. This interpreter does NOT support DisplayMenu(), or any double floating point methods. This interpreter does NOT support direct referencing or methods-calling-methods.
10.0	Enhanced HART Post-Read Pre-Write Methods. When the Enhanced HART Interpreter is enabled (See Section 6 of SRS-347). Post-Read and Pre-Write Methods can now do more than the 6 scaling builtins. Post-Read actions can now change local variables and run all the builtins except: any UI builtins (such as ACKNOWLEDGE()) or HART communications (such as send_command()).
10.0	Gauge Control now shows units from the graphed variables. In previous revisions of AMS Device Manager the Gauge Control would show units next to the value only if the units were defined in the Axis. This logic has been changed so that if there is no unit defined for the axis, AMS would then check the unit for each individual variable on the gauge and if it existed it would be displayed next to the value at the bottom of the gauge.
10.0	Gauge Control background colour, text bolding, and border. The Gauge control now defaults to a background colour of “white” (instead of “metallic silver”). The values shown at the bottom of the Gauge control are larger and bolded to make them stand out better, and the border is recessed to give the Gauge a 3-D look.

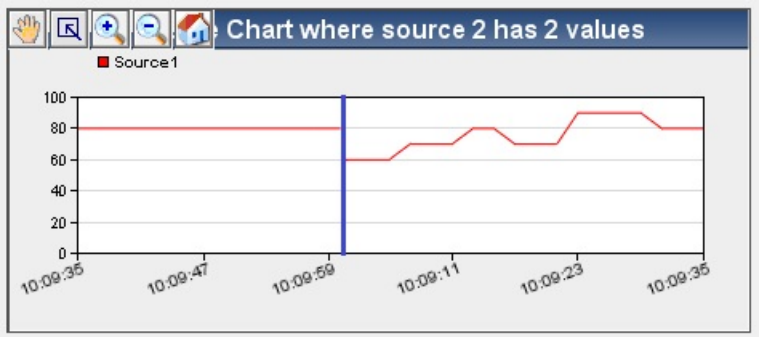
10.0	Bar Chart Control “border” and “full-scale value location” have been changed. The Bar Chart Control now has the border recessed to give the Chart a 3-D look. The values displayed above (or beside) the bars now are moved INSIDE the bar if the bar is within 90% of full scale. Previously the value was always displayed OUTSIDE the bar, so when the bar reached or exceeded full scale the value was not displayed
10.0	The Default Graph Control size is now MEDIUM for both HART and FF. Previously HART was defaulting Gauges, Grids, Charts, and Graphs to LARGE if the device developer did not specify the Graph Control size. See HCF Spec 500.
10.0	If a Graph, Chart, or Gauge is SMALL or X_SMALL the default number of tick marks will be 5. Previously, these size of controls had 10 tick marks and made for a busy control
10.0	The Chart Controls use the length of the chart correctly. In previous versions the amount of data displayed on a Chart was calculate to take CYCLE_TIME into account (wrongly).
10.0	Strip Charts will now retain more than 30 minutes of data if-and-only-if the LENTH of the chart is greater than 30 minutes. In previous version of AMS Device Manager if the device developer set the length of the chart to 60 minutes the chart would still only display 30 minutes.
10.0	Parameters located on a Menu of “Style WINDOW” now create a (virtual) PAGE with the Label of the parent WINDOW. Previously AMS Device Manager would create a (virtual) PAGE with the Label “Other”. This is still a temporary fix, ultimately AMS Device Manager needs to support parameters located on a WINDOW without having a PAGE.
10.0	The Label of a BitEnum is now displayed. When a Device developer added a BitEnum to a menu, AMS Device Manager will now create a group box around the bits of the BitEnum, and the label of the BitEnum is the label of the group box. In previous revisions of AMS Device Manager the group box did NOT have a label.
10.0	Hexidecimal display of integers now works correctly. If a parameter has (both) the display_format and edit_format set to “x” or “X” AMS Manager will correctly support this hexadecimal display and editing (for 8 byte integers the display and edit format must be set to: “llx” or “llX”
10.0	PreEdit Method of an enumerated parameter now occurs BEFORE the drop-down is displayed. In previous version of AMS Device Manager the Pre-Edit Method was executed AFTER the drop-down was displayed.
10.0	Aborting an InitAction will disable the execution of ExitActions. In previous versions of AMS Device Manager ExitActions would still be executed if the InitAction had been Aborted.
10.0	Group boxes are only nested two levels. If the default mechanism encounters more than two GROUP boxes it will convert the third GROUP box into a menu of style WINDOW. In previous revisions AMS Device Manager would allow a GROUP, under a GROUP, under a GROUP, under a GROUP until the parameter control is not allowed any client area in which to be displayed.
10.0	Menus of Style TABLE are now displayed, even if they are located under a

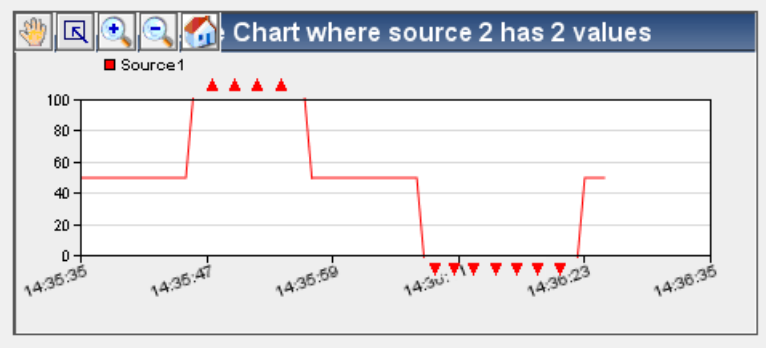
	window of Style PAGE. In previous versions of AMS Device Manager they were filtered out. Now they are defaulted based on the rules specified in HCF Spec500.
10.0	Word-Wrapping of static text now calculates height and width correctly. In previous versions of AMS Device Manager static text might take too much vertical space. OR in cases where carriage returns were used, not enough space would be allocated on the screen and the static text would be clipped.
10.0	Graphs now display BLACK lines properly. In previous version of AMS Device Manager when the Device developer set the Waveform color to BLACK (0), AMS would consider this to be NULL and revert the color to the default (RED).
10.0	Device.ini file can force display of Configure, Process Variables, Device Status, or Compare to be Resource based. This is sometimes useful if the device developer wants to display something different for the compare screen than for the configure screen.
10.0	Device.ini file can force display of Configure, Process Variables, Device Status to use HandHeldLayout rules (TABLE format) even though the device defines the styles of those menus. This is sometimes useful if you want to reduce the amount of data read from the device at one time.
10.0	Device.ini file can force display of Configure, Process Variables, Device Status and Compare to use EDDL layout rules (using a different starting moniker) in spite of the fact that the style of the top level menu is TABLE. This is used to avoid using HandHeldLayout rules for wireless devices that are designed for use on a gateway (what has been termed: “Optimized for wireless”).
10.0	Device.ini file can define a landing point different than the “Configure” screen. This is an option added to set “Overview” (Process Variables) as the default screen for Wave 0.5 devices
10.0	There is preliminary support for Refresh Actions. Currently Refresh actions work on HART Graphs and FF Charts. They do NOT execute when Graphs/Charts are zoomed or panned. They do NOT execute on Parameters
10.0	There is preliminary support of FF Cross-block. The functionality should be complete, but has not been fully tested.
10.0	There is preliminary support for VALUE_ARRAYs. Currently in HART, VALUE_ARRAYs work in: Methods, Menus and Waveforms. They do NOT work in: grid-vectors, and there is an unresolved issue with a value_array in a menu on a HART test DD. Currently in FF, VALUE_ARRAYs work in: Methods, Menus and Waveforms. They do NOT work in: grid-vectors.
10.0	Embedded icons in FF devices will NOT cause lockups the very first time the icon is displayed. In previous version of AMS Device Manager if there was an FF EDDL device with and embedded icon the very first time that device was displayed AMS Device Manager would lockup. This was because AMS spawned another thread to read the context menu information (methods) at the same moment that the icon was being retrieved. DCI (the interface used to get both pieces of information) was NOT thread-safe which caused the lockup.
10.0	AMS Device Manager will now support PlantWeb Alerts for HART devices. This is done by adding “Orphan” menus that have specific names:

	"PWA_Failed", "PWA_Maintenance", & "PWA_Advisory" (See SDD-1074). The DDInstall program will then create alert and alm files based on these menus.
10.0	AMS Device Manager also now supports NumberOfPoints property on XY Graph Waveforms
10.0	AMS Device Manager now supports Fieldbus sy5 files with the ff5. Previously AMS only supported an sym file with the ff5. Now AMS will support either.
10.5	AMS Device Manager will search for a XXX_wha_root_menu in cases of wireless HART. If a device is wireless and an XXX_wha_root_menu exists AMS device manager will use that menu rather than an existing XXX_root_menu (See SRS-347). (this was thought to work in AMS Device Manager 10.0 – but it was missing server work that was not completed until AMS Device Manager 10.5.
10.5	Added DDL Foreign language support for Fieldbus DD's.
10.5	Added FILE and LIST support in Fieldbus (only tested floating point elements of lists – we did not test integers or string LIST elements).
10.5	Added "Default Value" support for HART.
10.5	Upgraded MenuDisplay() and Menu() builtin support in HART. The builtin will now launch directly into the menu without the user having to click on a button.
10.5	InitActions, RefreshActions, ExitActions now work for Sources in HART.
10.5	Added support for RefreshActions on Sources in Fieldbus.
10.5	Added support for RefreshActions on Waveforms (graphs) for both Fieldbus and HART – (However, the FF tokenizer still does not support cycle time on graphs – so Fieldbus is limited to the default cycle time of 1 second, rendering this feature useless for FF)
10.5	Added support of VALUE_ARRAY being assigned as a GRID VECTOR in Fieldbus.
10.5	Added optional disabling of Device Diagnostic tree redding – this helps performance significantly for WAVE devices.
10.5	Reduced Minimum Chart Length to 1 second (required for FF HIST TEST).
10.5	Added detailed legend to Charts, Graphs and Gauges. Right mouse click on a Chart/Graph or Gauge to get a context menu which allows launch of a detailed legend dialog box (Added to pass FF HIST TEST).
10.5	Added new FF builtins to the Fieldbus Method interpreter. This includes the Cross Block builtins, FILE and LIST builtins, and MenuDisplay() builtin.
10.5	Fixed bug where Keypoints on graphs did NOT work correctly (Affects both HART and FF).
10.5	Fixed an issue with HART DDS where we did NOT support extended block tables for FM8 files.
10.5	Vertical Waveforms were not working on HART and FF Graphs – this has now been fixed.

10.5	Linetype Transparent has been added to the 5.1 tokenizer and now works for CHARTS on Fieldbus devices.
10.5	Changed behavior of Device Window so that previously viewed Tree controls are destroyed when changing views. (i.e. if you launch into the Device Diagnostics screen and then switch to Configure, the Device Diagnostics callbacks are destroyed so the performance of the Configure screen remains good.
10.5	Added Device.ini file settings to change Dynamic Refresh rates on a by-device type basis. Adding the following to a device.ini file: [DynamicRefresh] HighLatency=8000 LowLatency=15000 Will change the update rate of dynamic variables for this device type. Adding the following to the fms.ini file: [DynamicRefresh] HighLatency=300000 Will change the update rate of all high latency devices system wide (except where they are overridden in the device.ini file). System wide low latency device dynamic update rate is still controlled by the registry entry at: "HKEY_LOCAL_MACHINE\SOFTWARE\Fisher-Rosemount Systems\Asset Management Solutions\DCI\RefreshInterval\MinAllowed"
10.5	Added a fix to HART communications. If a burst command was received, the Server now only updates the burst_mode or burst_command if those parameters are read only. This avoided problems of locking up the parameter cache for read-write burst_mode & burst_command properties (AOEP00032542).
10.5	Added a fix to HART communications. If polling_address or burst_mode_select are read-write (instead of write-only) the HART Server will no longer lock-up.
11.0	Added Profibus DP support.
11.0	Increased the size of the HART Method Interpreter dialog (AOEP00034727).
11.0	Increased number of parameter controls per page from 200 to 600.
11.0	Resolved an EDDL Screen Layout issue: Groupboxes were not taking all columns into account when calculating group box height
11.0	Changed Validity of parameters to NOT display the parameter control if it was VALIDITY FALSE – this means that a parameter control that is VALIDITY FALSE will NOT take up screen real-estate. This is true now for: Gauges, Charts, Graphs, parameter controls, methods, images and group boxes.
11.1	Disabled Snap-On support for Profibus-DP

11.1	Fixed a number of issues with Internationalization dealing with decimal separators (i.e. “1,0” instead of “1.0”). This was a major issue for German and Russian operating system installs(AOEP00035137).
11.1	GET_DEV_VAR_VALUE() now displays ItemArray Index parameters a pick-from-lists instead of integer values.(AOEP00033789)
11.1	MenuDisplay() builtin in FF now supports a crossblock. (AOEP00034375).
11.1	Fixed Lock-up issue if Read Command requires the parameter to be read as a Request Item. – This was a problem with fm8 version of Rosemount 3144 (AOEP00033659).
11.1	Fixed problem with HART method interpreter that allows support for 0 or 1 based indexing of ItemArrays (AOEP00033787).
11.1	HART Forward compatibility should cross protocol revisions HART 5 to HART 7.
11.1	If DDS or Communications errors are encountered they are displayed to the users as negative numbers rather than textual messages (i.e. “-2444” instead of “No read command for variable”)
11.1	Bad response codes from send_command() HART built-ins cause methods to abort. This means that response code handling in methods is broken.
11.1	Improved HART method interpreter logging to dump all builtin calls, with arguments and return values.
11.5	FILE construct is now supported for HART (Currently, HART and FF support FILE - this is NOT implemented for PROFIBUS-DP)
11.5	LIST construct is now supported for CLASS LOCAL variables for HART (LIST is now supported in HART to the same (or greater) extent as it is for FF)
11.5	The Grid control has had a number of improvements: 1. Better defaulting of column width 2. User resizable columns within a grid 3. Correct support of validity 4. Correct display of TIME, DATE, ENUM, INDEX and BIT Enums within grid 5. Allow cursor key navigation through grid control (previously you could only navigate using mouse) 6. Error messages are displayed if user attempt to enter invalid data via grid editing 7. Consistently left align all data types in grid 8. If space exists between the last vector of the grid and the bottom of the grid, it will now be filled with empty (non-editable) cells – previously this space was left blank and it was thought to be aesthetically unappealing.
11.5	Device Screens now dynamically change layout based on validity.
11.5	"OK", "Apply", and "Cancel" buttons have been replaced by the "Send" and "Close" buttons.
11.5	"Send" (the button previously known as "Apply") is now available on sub-

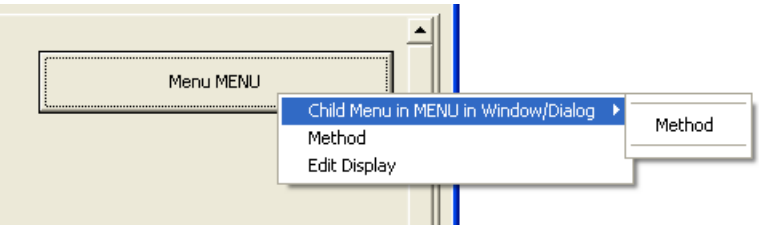
<table>
<tr><td></td><td>windows.</td></tr>
<tr><td>11.5</td><td>The HART, Profibus and FF server will all give priority to reading static variables rather than re-reading dynamic variables
(This should improve screen updates - especially on WAVE Overview screens).</td></tr>
<tr><td>11.5</td><td>Gauges now display floating point variables with the display format defined in the DD
(not hard coded: x.xx)</td></tr>
<tr><td>11.5</td><td>Gauges now support dynamic updating of scale (min and max values).</td></tr>
<tr><td>11.5</td><td>Graphs now invoke Refresh Actions when Pan and Zoom (as per HART/FF/Profibus rules)</td></tr>
<tr><td>11.5</td><td>Graphs now support validity of Waveforms</td></tr>
<tr><td>11.5</td><td>SWEEP charts are now displayed correctly (with a sweep line).
 

Previously sweep charts were displayed as SCOPE charts</td></tr>
<tr><td>11.5</td><td>Charts and graphs now give feedback to user if the data is being plotted beyond scale.
 

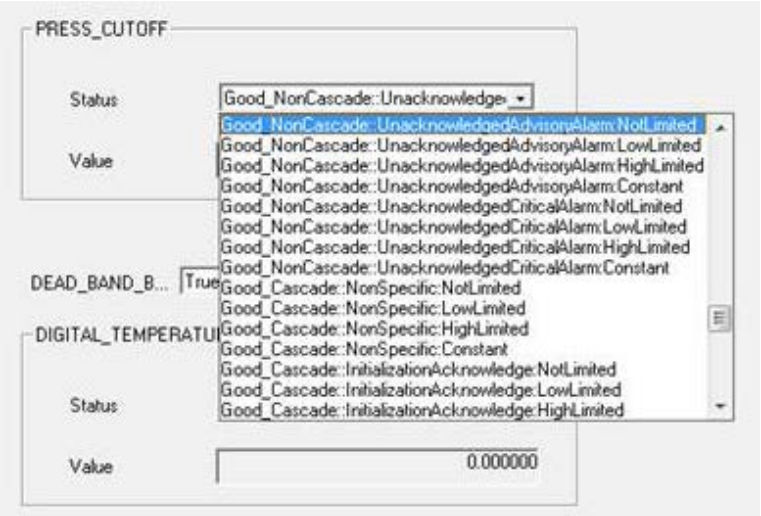
Previously the user had no indication what the value was – it was just a blank chart.</td></tr>
<tr><td>11.5</td><td>The Height of charts, graphs and grids has been changed to match other hosts.

<table>
<tr><th rowspan="2">Specification</th><th colspan="2">Height (in Simple Fields)</th></tr>
<tr><th>“UseLegacyChartHeight=No”
(New Values)</th><th>“UseLegacyChartHeight=Yes”
(Original Values)</th></tr>
</table>
</td></tr>
</table>

<table>
<tr><td></td><td>
<table>
<tr><td>XX_SMALL</td><td>3 Row Heights</td><td>3 Row Heights</td></tr>
<tr><td>X_SMALL</td><td>5 Row Heights</td><td>4 Row Heights</td></tr>
<tr><td>SMALL</td><td>7 Row Heights</td><td>5 Row Heights</td></tr>
<tr><td>MEDIUM</td><td>8 Row Heights</td><td>6 Row Heights</td></tr>
<tr><td>LARGE</td><td>9 Row Heights</td><td>Half the height of the page</td></tr>
<tr><td>X_LARGE</td><td>11 Row Heights</td><td>¾ of the heightof the page</td></tr>
<tr><td>XX_LARGE</td><td>13 Row Heights</td><td>Height of the page</td></tr>
</table>

There is also a device ini file override if the new heights are problematic for an existing DD
</td></tr>
<tr><td>11.5</td><td>HETEROGENIOUS Collections are now supported within EDDL device windows (collections can be displayed in the UI as children of menus).</td></tr>
<tr><td>11.5</td><td>Popup menus are now supported from within a WINDOW or PAGE (as per HART SPEC-500).
 
</td></tr>
<tr><td>11.5</td><td>Menu style TABLE (HandHeld Layout rules) has changed the behavior of Images, Graphs, Charts and grids to conform with the HCF SPEC-500</td></tr>
<tr><td>11.5</td><td>Review Qualifier is now inherited to sub-windows as per HCF SPEC-500</td></tr>
<tr><td>11.5</td><td>Aggregate concatenation of Labels is now supported (labels are now displayed in AMS Device Manager using exactly the same rules as the 475).</td></tr>
<tr><td>11.5</td><td>EDIT_DISPLAY pre/post edit methods are now supported on EDIT_DISPLAYs (Not to be confused with variable pre/post edit methods within an EDIT_DISPLAY)</td></tr>
<tr><td>11.5</td><td>HART DATE now supports the full range dates: 1900-2125 instead of 1970-2036</td></tr>
<tr><td>11.5</td><td>Editing a "NaN" value (on a floating point variable) no longer creates garbage on the UI.</td></tr>
<tr><td>11.5</td><td>Refresh Actions on Variables are now supported in HART
(HART is the only protocol that has this defined)</td></tr>
<tr><td>11.5</td><td>Pre-Read Actions for Variables in HART is now supported
(This is currently also supported by PROFIBUS-DP)</td></tr>
<tr><td>11.5</td><td>Post-Write actions on variables in HART is now supported</td></tr>
</table>

	(This is currently also supported by PROFIBUS-DP)
11.5	Refresh Relationships now work consistently for fm8 files.
11.5	Error codes from server are once again being displayed as text instead of negative numbers. It now displays "Missing read command" instead of "Error -2443".
11.5	A number of issues have been resolved in the HART Method Interpreter: 1. Bad RESPONSE_CODEs no longer causes methods to abort 2. Pressing <enter> after inputting a value in the MenuDisplay() built-in no longer causes the method to abort 3. The ACKNOWLEDGE() built-in now correctly displays TIME_VALUE, HART_DATE, Enum and Index values. 4. The save_values() built-in now saves immediately... not at the end of method execution 5. The GET_DEV_VAR_VALUE() built-in now calls pre/post edit actions if they exist for the edited variable. 6. Calling pop_abort() from within an abort method no longer cause the method interpreter to crash 7.Accessing device_status variable before calling the send() built-in no longer cause the method interpreter to crash 8. Calling DELAY() built-in immediately after send() built-in does not cause the method interpreter to hang 9. The assign_int() built-in now checks for Out-Of-Range conditions 10. The add_abort_method() builtin no longer allows the adding of more than 20 abort methods - as per HART SPEC-501 11. Passwords are no longer displayed to the user in clear text within the ACKNOWLEDGE() built-in. 12. GET_DEV_VAR_VALUE() built-in now works for device variables of type DOUBLE 13. pre/post/init/refresh/exit actions are NOT run on HART Future devices or offline anymore. 14. The select_from_menu() built-in now sets the default selection correctly for very large lists.
12.0	Added support for displaying Enum-Bits in Grids
12.0	HART Delayed response works consistently throughout AMS Device Manager now (this avoids having to write workarounds in methods to deal with the issue on Wireless WAVE devices).
12.0	Tooltips are now displayed for Label (and values) that do not fit in the client area of the parameter control (this used to work in AMS Device Manager 6.2 and earlier – but it was broken when we ported the parameter control to UNICODE).
12.0	Parameter Control Dropdown now expands to show the full length of their contents (this is a big issue for about 200 Non-Emerson Fieldbus devices).

	
12.0	Parameter control applies EditFormat when the Parameter control gets focus, when the parameter control does not have focus, it applies DisplayFormat (there are many devices –including the Rosemount 644 – which have display format of ".2f" and an edit format of ".4f" – we now support this).
12.0	The default display format of floats is now "12.5g" NOT "f" (We now default correctly according to SPEC500).
12.0	Scaling factor is now correctly applied to AXIS min and max value references.
12.0	Menu Help is now supported on tabs and tree control items
12.0	Inline Images are now compressed better – AMS now uses Bi-cubic Interpolation algorithm from GDI+ to compress inline images (this was an issue for WAVE developers).
12.0	Resizing (or maximizing) the Device Window now increases the client area of the window. This allows more than 11 rows of parameter to be visible – or for that matter, more than 3 columns to be visible.
12.0	Fixed an issue where validity refreshes are delayed if init actions are being run (this avoids some issues where AMS Device Manager would crash while dynamically repainting the screen).
12.0	Postpone reading Image Path until the screen is laid out. This avoids reading Image Path on Images that are not visible because their parent menus are VALIDITY FALSE (this leads to a significant performance increase on WAVE device diagnostics screens).
12.0	Grid control now updates dynamic validity and handling correctly.
12.0	HART Server now sets default-defaults correctly as per SPEC-500 (date now defaults to 1/1/1900 instead of 12/31/1899).
12.0	AMS Device Manager now correctly support multiple HART burst messages – it does not assume a single burst message configured with a single write-only parameter as was defined in HART 5 – AMS now fully supports the burst functionality defined by HART 7 (this caused problems for Wireless WAVE devices).
12.0	HART7 Forward compatibility has been improved – AMS now correctly propagates the HART 5 Device Type Name if the software encounters a new HART 7 device that does not have a corresponding HART 7 DD installed. It will not use a "Generic" numeric Device Type Name if it can find a HART 5

	device or template in the AMS Database.
12.0	A number of issues have been resolved in the HART Method Interpreter: 1. 3,5,6 & 7 byte signed integers are now set correctly 2. PUT_MESSAGE() builtin now correctly disables the "Cancel" button. 3. Method interpreter sets now set values for unsigned integer correctly. 4. get_dev_var_value() for index now shows selections in the correct order 5. get_dev_var_value() for date now sets the value correctly 6. acknowledge() formatting of "3.1f,D" now works – device developer can specify display format AND specify that the value should dynamically update. 7. display() builtin now dynamically updates correctly.
13.0	HART Server will speed up the initial open time of some devices by limiting the read of dependent parameters to only those that have Read Clients. This is a mechanism similar to what the 475 has been doing for many years. This avoids refresh relationship thrash, which floods the communications channel with the same un-necessary read requests over and over again.
13.0	HART Commands which read value_array elements now work correctly when triggered from a method. Previously, the command would be sent, the data would be read from the command and put into the device bucket, but not reflected in the edit or method buckets. This was an issue discovered using the Rosemount 3308 which used methods to execute the commands manually. Note: Because fm8 files still do not support value array elements in searches of the ptoc table, the only way AMS Device Manager can support reading value_array data from the device is if a method triggers the read command. For AMS Device Manager to support reading value_arrays directly from the device, the same way it reads regular device variables, is to get a change to the HART tokenizer, and then update DDS to handle the new tables in the fm8 (or fma) file.