

BNCS Alarm System

Atos IT Services



Configuration of Alarm System Database Output Module

alm_db_output.dll, config_alm_db_output.dll

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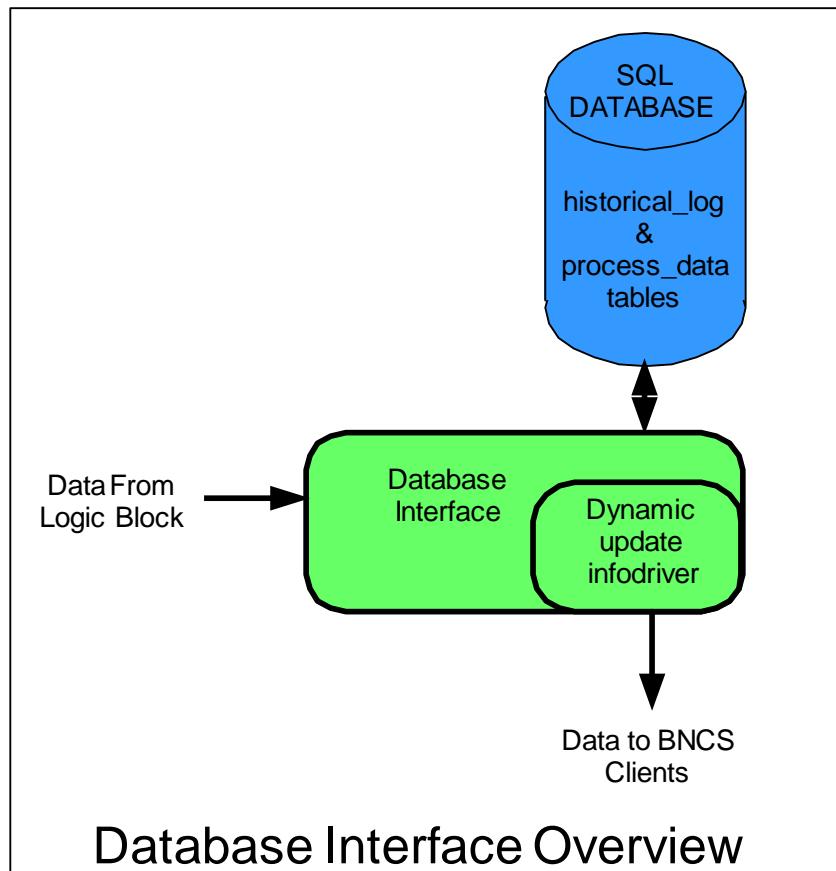
1 Alarm System – Database Outputs Configuration

1.1 Overview

This module (config_alm_db_output.dll) is part of the suite of modules that form the BNCS Alarm System. Its purpose is to edit the configuration of the Database Output module.

The Database Output module can write the current state of the alarm system to a database, and also add to a log of historical data.

The module can also supply historical log change information to a BNCS network, and allows BNCS panels to add information to the historical log.



1.2 Description

There are two database tables used by the alarm system. One (process_data) holds the current state of the processes and the other (historical_log) holds changes.

Whenever there is a change to a process the process_data table is updated accordingly.

If there is anything to log the historical_log has a new entry added to it.

Records in both tables are time stamped with the date-time, including a millisecond time. This later is not frame accurate, but there to allow the user to see the order in which messages arrived.

Only processes that are configured to do so will appear in the database tables.

See the document for more information about the available functionality of the module.

2 Configuration Procedure

To configure the module the BNCS v4.5 configuration tool should be used. The following explanation assumes that you are running the configuration editor and that this is connected to the relevant configuration server. It also assumes that you have already configured some inputs and some processes in the Alarm System.

It also assumes that you have a connection to the database server. We will create the tables below so an empty, unconfigured, database is fine as this will be done in due course. Alternatively an existing database might be used, in which case the configuration steps would apply but without the initialization actions.

There may be zero or more Database Output modules per alarm system. In practice most systems need only one database so only have one database output module.

There is some further information about MySQL and the required settings for the server in Appendix B.

There is some information about the format of the config file in Appendix C, though it is preferable to edit the files using the config editor.

2.1 Configuring the Outputs

In the configuration editor, select Alarms, Outputs, Database.

Select the Alarm System to be edited. It should already exist and processes should already exist as this editor needs to reference existing processes.

Actions relating to the whole module may be done either by right clicking in the bottom left hand pane (ie the context menu), via icons on the tool bar, or the Database Output menu item. Descriptions will not repeat this.

2.1.1 Creating a New Database Output Module

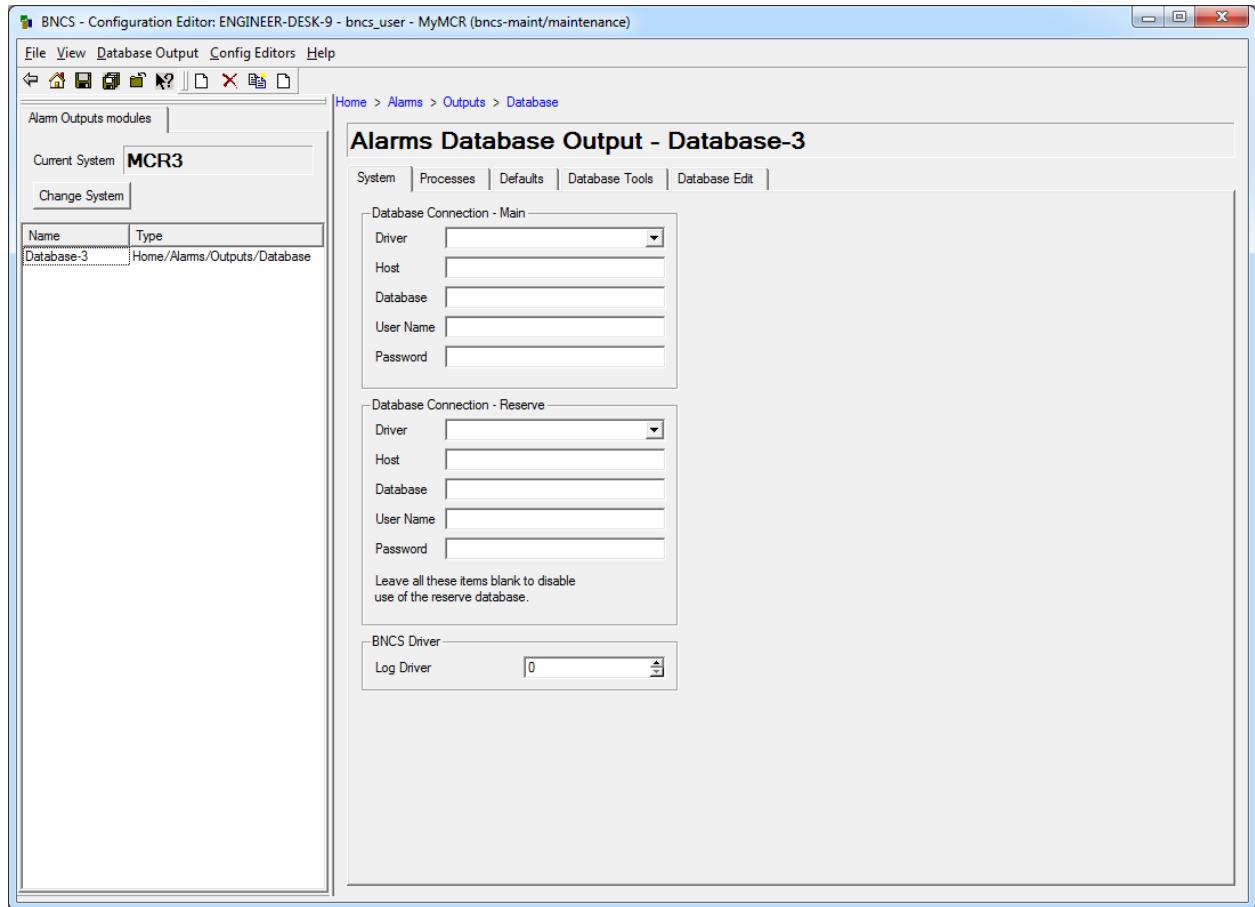
Select New Db I/F, or the icon on the toolbar.

This may be given a more meaningful name using the menu or pressing F2.

Change the name to a meaningful one and press return.

There are four tabs: System, Processes, Database Tools and Database Edit. We will look at them in the order needed if starting from scratch i.e. empty database and no Database output.

2.2 System



Items in this tab must be configured to enable the module to connect to the Database.

The items needed to configure a server are:

2.2.1 Driver

If the database is MySQL then chose the "QMYSQ3" driver in the drop down list otherwise choose "QODBC3".

2.2.2 Host

This is the host PC. Enter either the IP address or the DNS name.

2.2.3 Database

This is the database name. A database of this name must already exist on the database server and be accessible from this PC; this module is not able to create it.

If it doesn't already exist then the Database Tools and Edit tabs will not be able to display data.

2.2.4 User Name & Password

These are the username and password that you wish the alarm system to use. An account using these values should already exist on your database server. If they don't already exist then the Database Tools and Edit tabs will not be able to display data.

2.2.5 BNCS Driver

This is the driver number used for updates to the BNCS System. No external infodriver is required. The module connects directly to CSI as a driver.

The Database Output module will report Fail status if it is not able to connect to CSI using this driver number, or if it is zero.

2.2.6 Main and Reserve

If a Reserve database is configured all data will be written to both Main and Reserve databases.

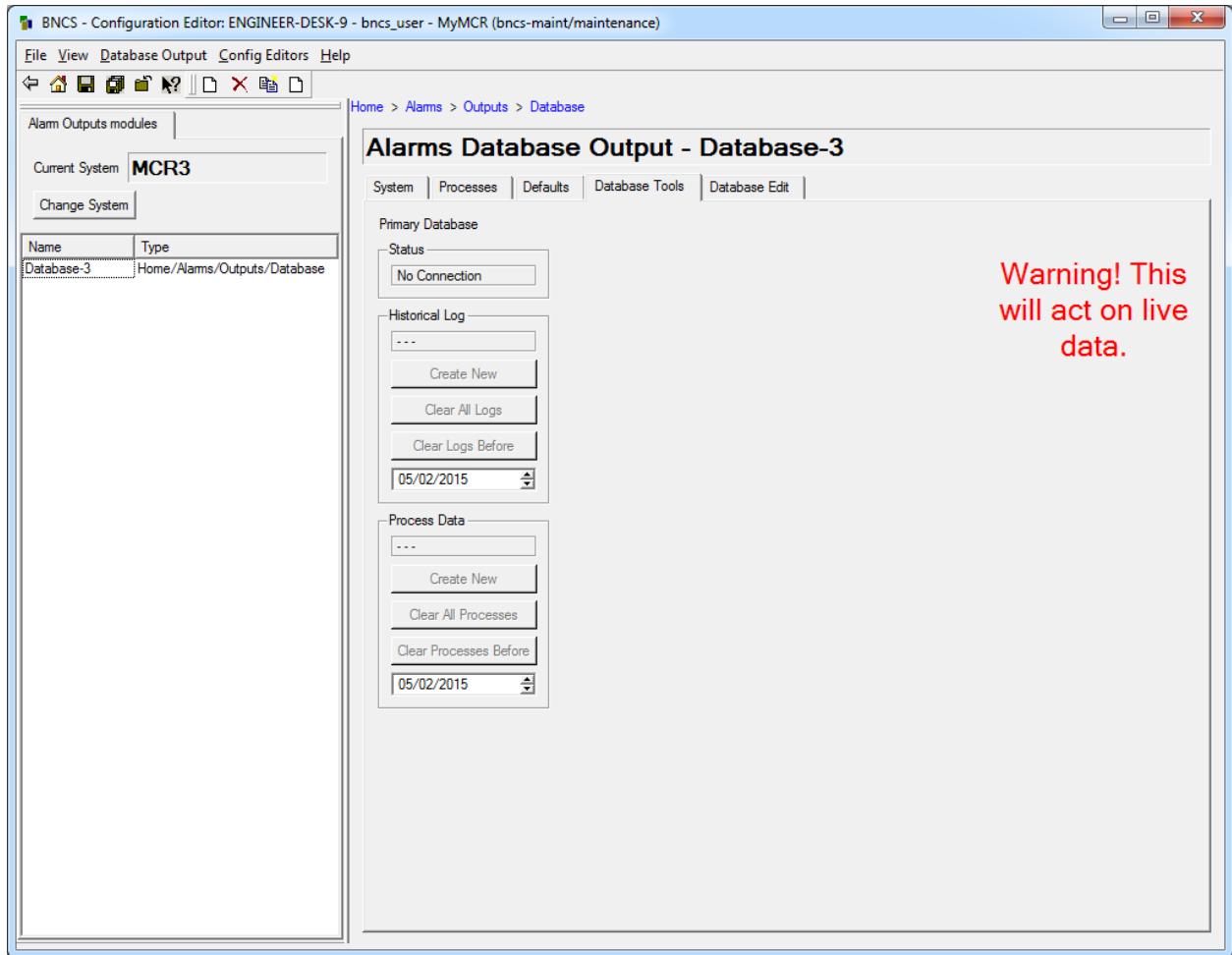
It is not necessary to have a Reserve database. If it is not required the Reserve database connection fields should all be left blank.

3 Database Tools

3.1 Creating the tables

If the tables "historical_log" and "process_data" don't exist then they will need to be created. Select the Database Tools tab.

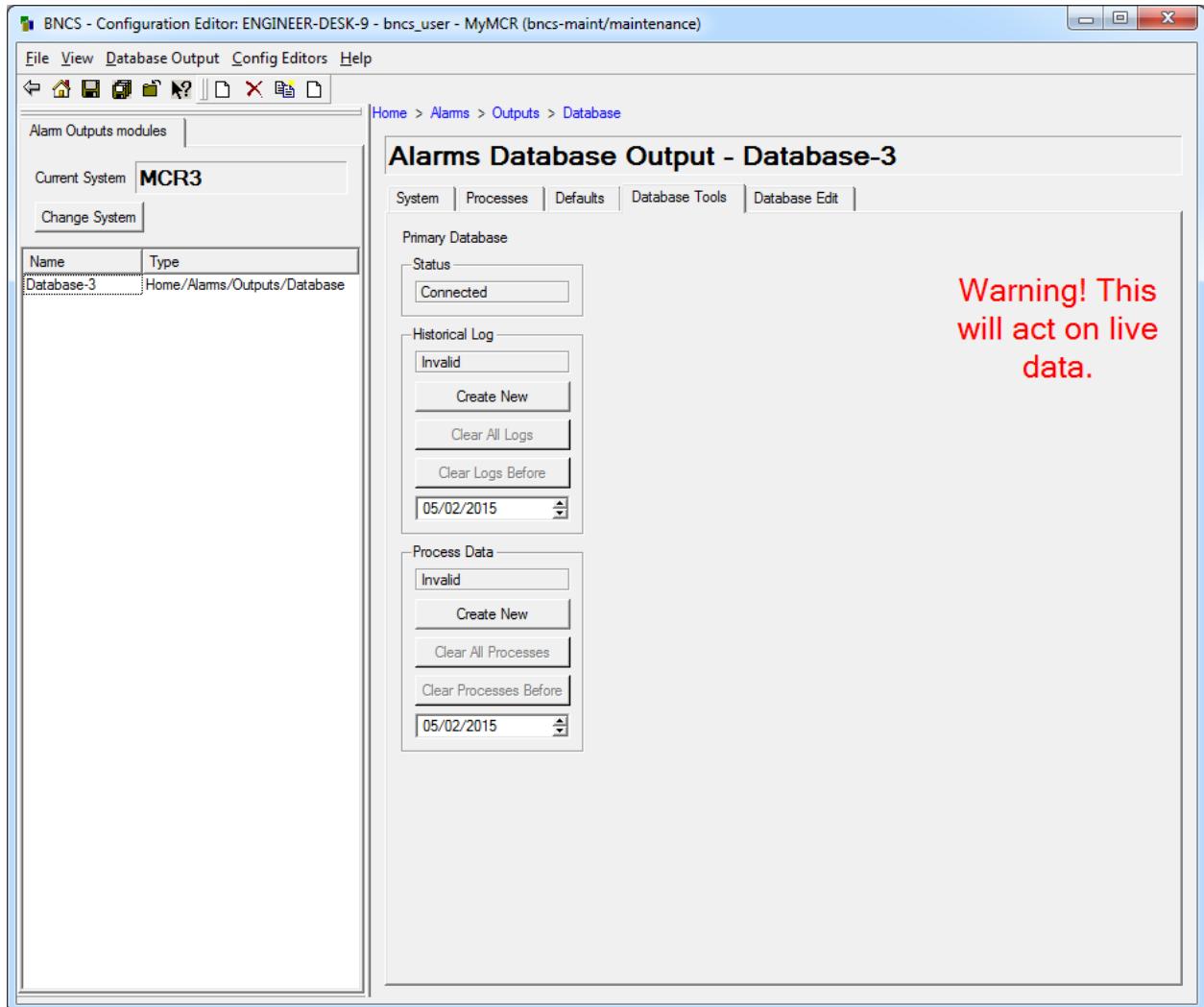
If the settings on the System tab are not correct the Status will show "No Connection". In this case the user settings for the database server need to be corrected or the settings changed on the server.



If the settings on the System tab are correct then after a few seconds it will read "Connected".

If the settings on the System tab are correct but the tables have not been created "Invalid" will be shown under each table heading – Historical Log and Process Data.

In that case the screen will look like this.



In order to create the tables press the “Create New” button for each table. This will create the tables with the correct variables and settings.

If this is successful then the indications will read “0” to indicate that the number of rows is zero.

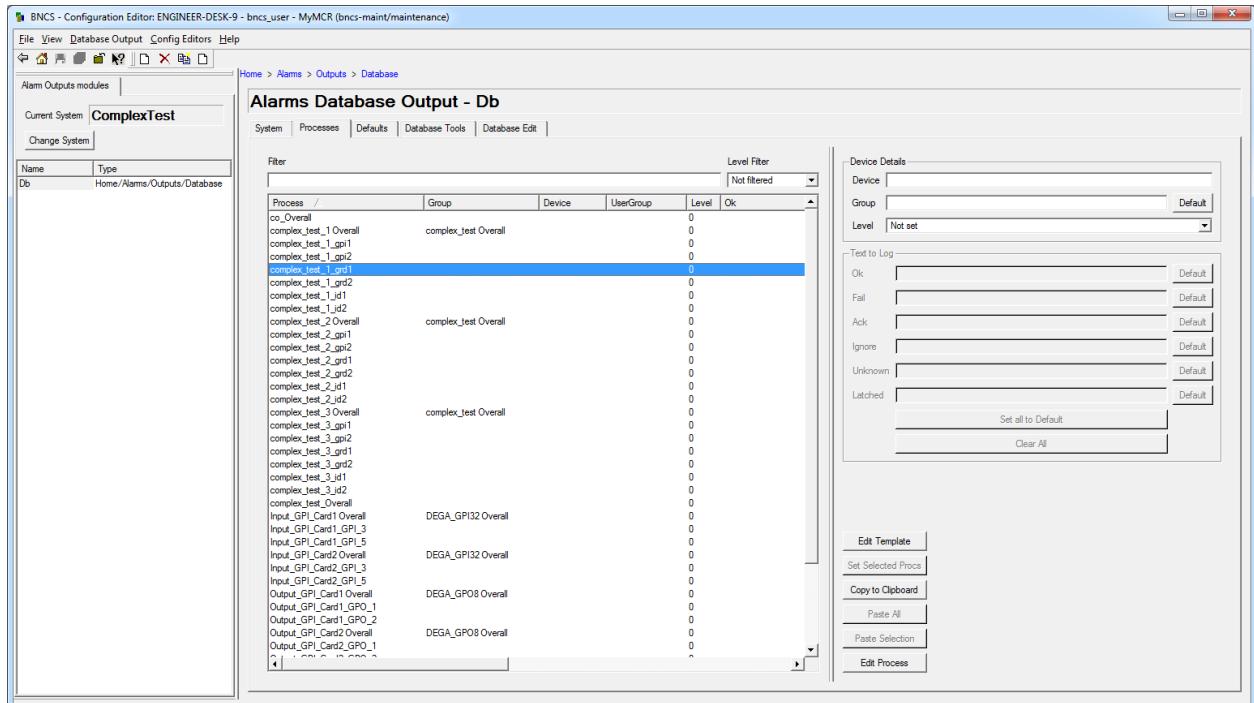
There also tools to clear the tables of all entries and to delete old log messages before a certain date.

If the database connection is not available it is still possible to configure the outputs. It just means that nothing will actually be written to the database until the user connections and tables are defined correctly and the database is accessible.

See Appendix A for the details of the tables and the commands used to create them. In normal circumstances it will not be necessary to create them manually – this information is provided in case it is necessary to diagnose any problems.

3.2 Processes

Selecting the Processes tab will show a page with all of the processes listed at the left of the main pane and configuration details on the right of the main pane. A process that has yet to be configured is shown below.



The configuration for each process allows us to set all the information that will be written to the database when the process enters any of the available states.

The elements available are as follows.

3.2.1 Level

There are 5 possible levels. This will determine the display parameters (ie colours) in the Log Control.

- 1 Information
- 2 Minor Warning
- 3 Major Warning
- 4 Minor Alarm
- 5 Major Alarm

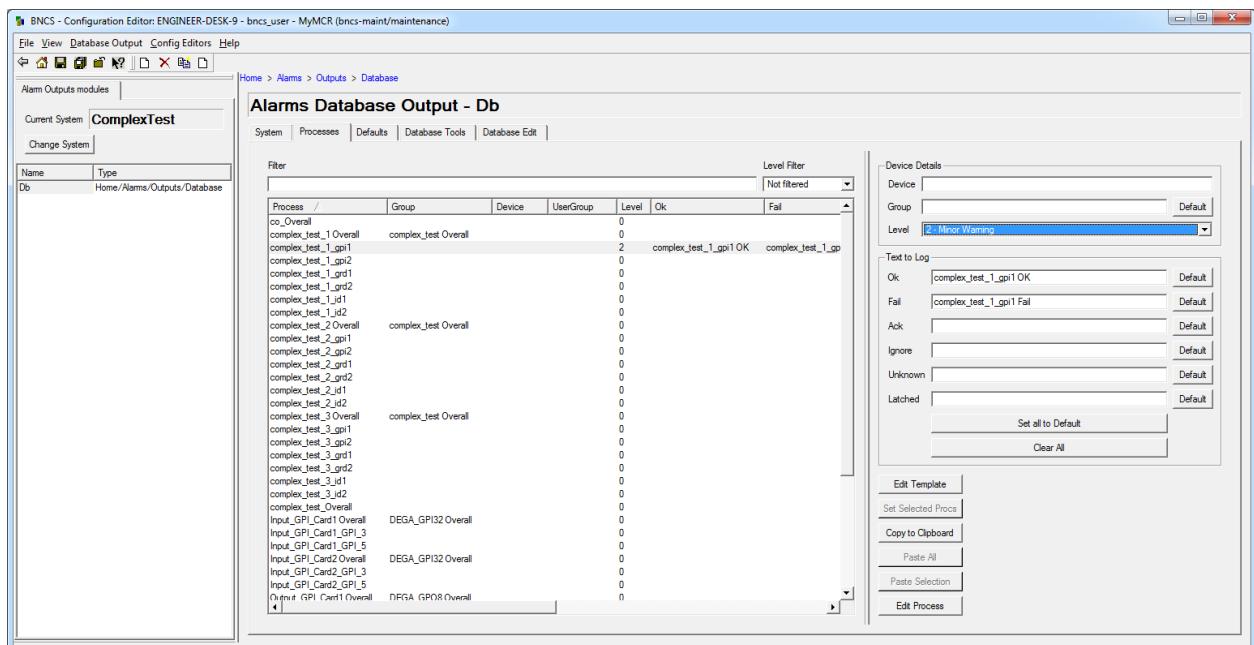
3.2.2 Text to Log

This is the text that will be logged in the historical log table when the process changes to any of the states listed. One or more of the states may cause text to be logged. The most commonly logged states are OK and Fail. Pressing the "Default" button will set the text to its default, which is usually to append the state to the process name (this may be

configured in the Defaults tab). Pressing the “set all to Default” will set all the states to their default text.

To configure any one process, click on it and fill in the text on the right hand side. The following shows a process set to “Minor Warning” with default text for “OK” and “Fail” states. To edit more than one process Set Selected Procs may be used – see below.

If the Level is set to zero the Text to Log controls will be disabled.



Optional elements are as follows.

3.2.3 Device

This can be used to display the (instance) device name on the Log Control. The log control can be filtered on any of the columns and it is useful to narrow the display down to a single device.

It is also possible for the panel to be written to use this information to navigate to a panel to adjust this device.

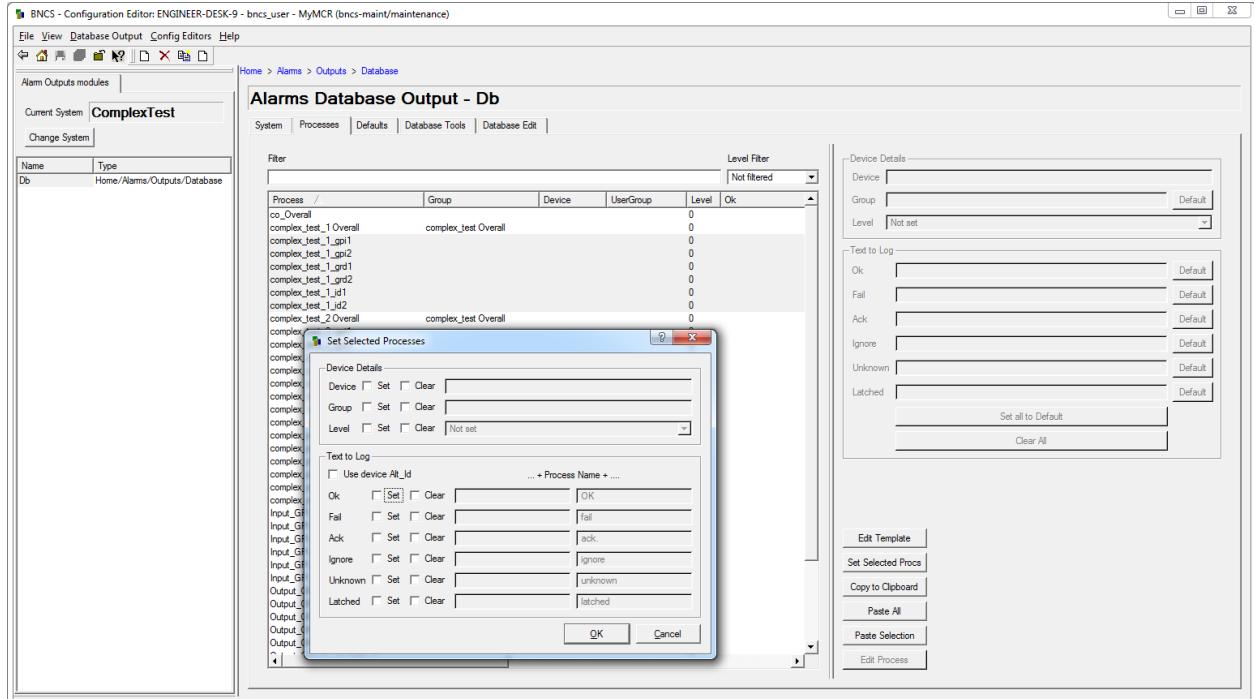
3.2.4 Group

This can also optionally be displayed in the Log Control. The default is the Process group but can be changed.

3.2.5 Editing Multiple Processes

To edit several processes, highlight the processes and press the “Set Selected Procs” button.

** A popup appears with the Device, Group and Level details of the current process (the last one you selected). ** (no it doesn't. Probably used to, until changed to allow selection of no processes)



If you check any of the set/clear boxes, you can change the property for all of the selected processes. This is useful when there are many processes in the same group that require the same settings. Select OK to make the changes.

Selecting "Use device Alt_Id" will replace the text that matches the device instance name with "%alt_id%". At run time this will be replaced by the "alt_id" from instances.xml for that device.

3.2.6 Copy/Paste via the Clipboard

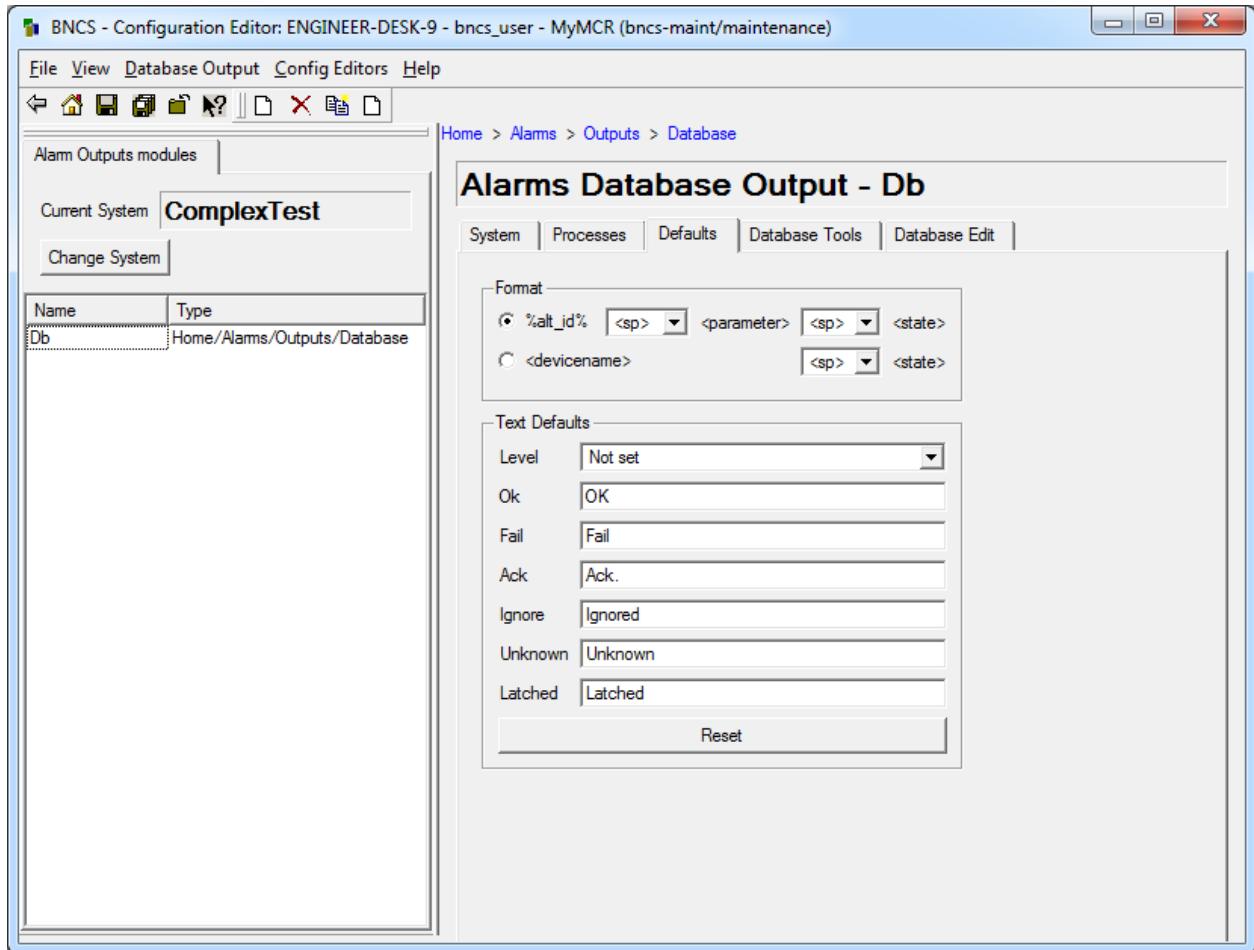
It is also possible to export and import data using the "Copy to Clipboard" and "Paste Selection" buttons. The data copied is tab delimited, so is suitable for use in spreadsheet applications.

3.3 Database Edit

Provided there is a connection to the database this tool allows for basic database editing. For SQL queries use the "SQL_script.exe" tool which is documented elsewhere.

3.4 Defaults

Use of the Default buttons in the "Text to Log" section is particularly useful if the default alarm state strings and Level may be configured. This may be done in the "Defaults" tab page.



The following default parameters may be set:

3.4.1 Format

The format of the log messages may be set based on either the alt_id string, or the device name. %alt_id% is followed by the parameter name and a string representing the state. The devicename (processname) is followed by the state string.

In either case the separator characters are also selectable here: space, underscore or dash/hyphen.

3.4.2 Text Defaults

The default alarm level and the default state strings may be set here.

The Reset button sets all these value to the standard “defaults of defaults” values.

All of these default parameters are saved between sessions on the client machine, so it is not necessary to set them at each restart.

4 General Notes and Tips

It is usually the case that when a process goes into alarm state there is more than one process affected, for example if the processes is also the input to an OR gate. It is possible (indeed likely) that the user only wants to see one event logged and not two (or more) for the same event. The way to achieve this is to avoid logging “Overall” or summary alarms.

Note that if an alarm is Forced On or Forced Off that the text logged will be identical to the Fail or OK text.

5 Process Filtering

On the Processes tab there are facilities to filter the set of processes displayed, by name or level.

5.1 Filter

A regular expression string may be entered here; the list will show only the processes which contain a string matching the regular expression.

5.2 Level Filter

Only those processes will be shown which log at the given level. If “not filtered” is chosen (the default), then no filtering is applied.

5.3 Process list-view

This list view shows all of the database output properties of the processes. Although the whole content is hard to see due to the number of columns and the length of the text usually in them; it presents an overview, to more easily see gaps, or corrupted data.

The size of the whole dialog, the list view, and the column widths are saved on the client machine between sessions.

5.4 Clear all

The Clear All button deletes all properties for the currently selected process.

| Process / | Group | Device | UserGroup | Level | Ok | Fail |
|--------------------------|----------------------|--------------------|-------------------|-------|---------------------------|-----------------|
| co_Overall | | co | complex_test_0... | 3 | %alt_id% Overall OK | %alt_id% Overra |
| complex_test_1_Overall | complex_test Overall | | dev overall | 4 | complex_test_1_Overall OK | complex_test_1 |
| complex_test_1_gpi1 | gpi | complex_test_1 CT1 | | 4 | %alt_id% gpi1 | %alt_id% gpi1 F |
| complex_test_1_grd1 | grd | complex_test_1 CT1 | | 4 | %alt_id% grd1 | %alt_id% grd1 F |
| complex_test_1_id1 | id | complex_test_1 CT1 | | 4 | %alt_id% id1 | %alt_id% id1 Fa |
| complex_test_1_id2 | id | complex_test_1 CT1 | | 4 | %alt_id% id2 | %alt_id% id2 Fa |
| complex_test_2_Overall | complex_test Overall | | dev overall | 4 | complex_test_2_Overall OK | complex_test_2 |
| complex_test_2_gpi1 | gpi | complex_test_2 CT2 | | 4 | %alt_id% gpi1 | %alt_id% gpi1 F |
| complex_test_2_grd1 | grd | complex_test_2 CT2 | | 4 | %alt_id% grd1 | %alt_id% grd1 F |
| complex_test_2_id1 | id | complex_test_2 CT2 | | 4 | %alt_id% id1 | %alt_id% id1 Fa |
| complex_test_2_id2 | id | complex_test_2 CT2 | | 4 | %alt_id% id2 | %alt_id% id2 Fa |
| complex_test_3_Overall | complex_test Overall | | dev overall | 4 | complex_test_3_Overall OK | complex_test_3 |
| complex_test_3_gpi1 | gpi | complex_test_3 CT3 | | 4 | %alt_id% gpi1 | %alt_id% gpi1 F |
| complex_test_3_grd1 | grd | complex_test_3 CT3 | | 4 | %alt_id% grd1 | %alt_id% grd1 F |
| complex_test_3_id1 | id | complex_test_3 CT3 | | 4 | %alt_id% id1 | %alt_id% id1 Fa |
| complex_test_3_id2 | id | complex_test_3 CT3 | | 4 | %alt_id% id2 | %alt_id% id2 Fa |
| complex_test_Overall | | complex_test | complex_test_0... | 3 | %alt_id% Overall OK | %alt_id% Overra |
| Input_GPI_Card1_Overall | DEGA_GPI32 Overall | | | 0 | | |
| Input_GPI_Card1_GPI_3 | | | | 0 | | |
| Input_GPI_Card1_GPI_5 | | | | 0 | | |
| Input_GPI_Card2_Overall | DEGA_GPI32 Overall | | | 0 | | |
| Input_GPI_Card2_GPI_3 | | | | 0 | | |
| Input_GPI_Card2_GPI_5 | | | | 0 | | |
| Output_GPI_Card1_Overall | DEGA_GPO8 Overall | | | 0 | | |
| Output_GPI_Card1_GPO_1 | | | | 0 | | |

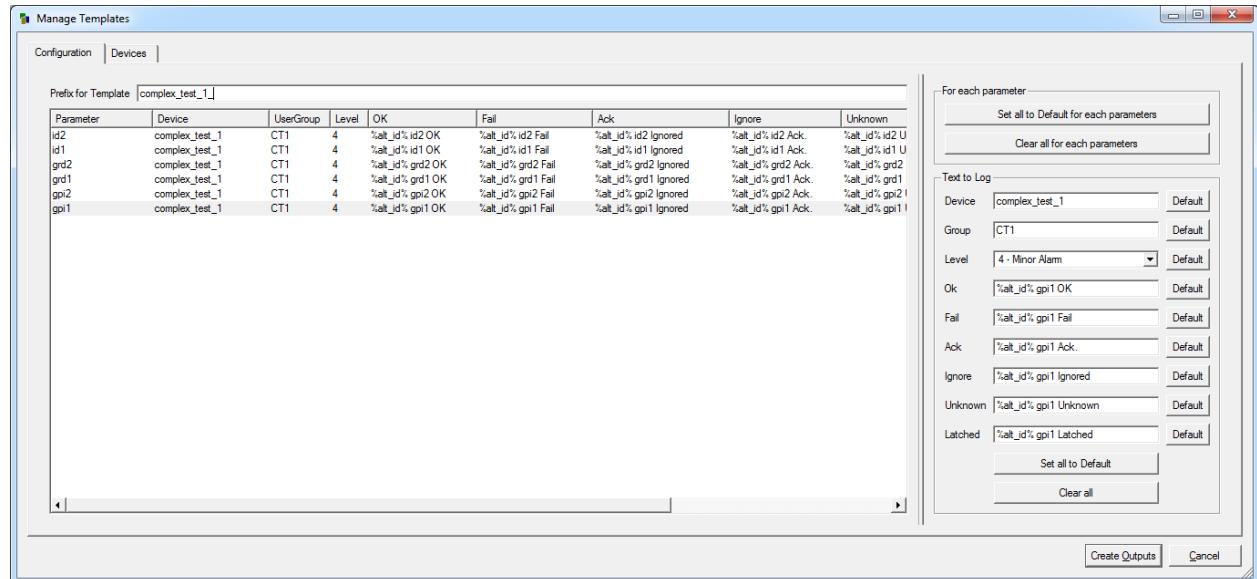
6 Edit Template

The Template system allows a number of processes to be edited in one step.

6.1 Configuration

Press the "Edit Template" button to open the Manage Templates dialog window. This looks similar to the main panel, but if something is present in the Prefix for Template edit field, it lists only those processes starting with the given prefix, with that prefix removed. The first column name is not Process, but Parameter; the prefix having been removed from the process name. The other columns show the current settings of each process.

If on the main panel several processes are selected when Edit Template is pressed, the prefix on the opening dialog is filled automatically with any common prefix of the selected processes. Processes not matching it will not be shown.



Here the user may edit the data at the same way as the main panel, i.e. select one process, and edit the fields on the right hand side by hand or through pressing the Default, Set all to Default, or Clear All buttons. Or use the Set all to Default for each parameter button, which fills the data of every parameter with default values; or use the Clear all for each parameter button.

If, in the Defaults tab (see above), the <devicename> mode is used, rather than %alt_id%, then the state strings will be set to start with the given prefix. This will be replaced with the current device name later in the process.

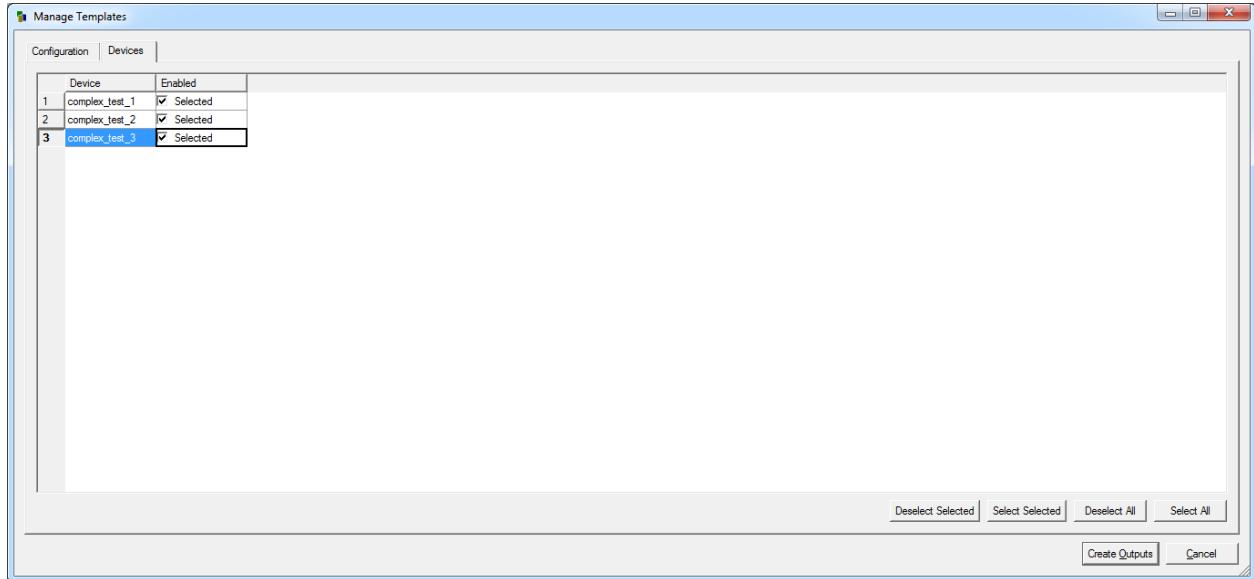
Editing causes the edit field Prefix for Template to be disabled to prevent losing data, because changing the prefix would trigger reloading.

6.1.1 Devices

On the Devices tab page the devices which fit the set of the parameters are listed. The user should select those devices to be affected. The unselected ones remain unchanged.

The Select/Deselect Selected/All buttons at the bottom allow the selection state of groups of these to be changed more easily.

To update the selected processes, press the Create Outputs button.



6.1.2 Notes and Tips

Some uses of this feature in practice:

6.1.2.1 New Device Type

First scenario: You have processes of a new device type.

Step 0: Set the default texts at the default tab page. Usually they are the same during a project, so it has to be done only once at your client machine.

Step 1: Select the processes belonging to one instance of the new device type on the *Process* tab page, and click on *Edit Template*.

Step 2: On the *Manage Template* dialog window, click on *Set all to Default for each parameters* button, which fills everything with default values.

Step 3: Tune the settings, e.g. change the log level for some parameters, clear the row for overalls, etc.

Step 4: Navigate to the *Devices* tab, and select the new devices.

Step 5: Click on *Create Outputs*.

6.1.2.2 Change Existing Device Type

Second scenario: You have new processes of an existing device type, and for its instances there are already database outputs set. (This is a more common case than the previous one.)

Step 0: Set the defaults if you haven't yet done so.

Step 1: Select the processes belonging to one old instance of the device type on the *Process* tab page, and click on *Edit Template*.

Step 2: Navigate to the *Devices* tab, and select the new devices.



Step 3: Click on *Create Outputs*.

7 Replacement Text

There are a number of special text elements which, if present in any of the Text to Log strings, will be replaced by the corresponding attribute values from the device instance.

All the markers start and end with '%'.

The references should be fairly obvious, and are listed below.

| Marker | Attribute | Notes |
|-------------|---------------------------------|----------------------------------|
| %alt_id% | alt_id | |
| %location% | location | |
| %composite% | composite | "yes" or "no" |
| %type% | type | |
| %ref% | ref | This is the entire ref attribute |
| %device% | device section of ref attribute | Integer |
| %offset% | device section of ref attribute | Integer |
| %complex% | device section of ref attribute | |

8 Documents Referenced

This document should be read in conjunction with other documents in the tree.

In particular:

Alarm – overview

alarm – Database Output

alarm – mainapplication

The documentation relating to file formats may also be useful.

9 Version History

9.1 Software Version

| Version No | Date | Details | Name |
|------------|------|---------|------|
| | | | |

| | | | |
|---------|-------------------------------|---------------------------------------------|-------------------|
| 1.00.00 | 31 October 2014 | Original Release | Charlotte Bell |
| 1.00.00 | 13 January 2004 | Demo system | Charlotte Bell |
| 2.00.00 | 31 March 2004 | System now one application with plugin dlls | Charlotte Bell |
| 4.5.1.0 | 1 st November 2007 | Added the alt_id | Charlotte Bell |
| 4.5.2.0 | 28 May 2009 | Added filtering/defaults/edit template. | Robert Bagyinszki |
| | | | |

9.2 Document Version

| Version No | Date | Details | Name |
|------------|-------------------------------|-----------------------------------------------------------------------------------|-------------------|
| 1.00.00 | 31 October 2014 | Original Release –separate from the Database Outputs doc | Charlotte Bell |
| 2.00.00 | 6 December 2005 | | Charlotte Bell |
| 2.01.00 | 1 st November 2007 | Added alt_id | Charlotte Bell |
| 2.02.00 | 28 May 2009 | Added: New features of version 4.5.2 | Robert Bagyinszki |
| | 10/02/2015 | Corrections and amendments. Images reworked from current versions of software. | Richard Kerry |
| | | | |

10 Appendix A – Creating the Database tables

This section shows the SQL commands required to create the tables used by this module.

These operations are detailed here only for reference; they should NOT normally be used.

In normal circumstances the controls within the config editor should be used for creating the tables.

In normal circumstances it will not be necessary to create them manually – this information is provided in case it is necessary to repair any problems.

The syntax of SQL commands sometimes varies between different implementations. We allow the MySQL and SQL Server/ODBC variants; the two sets of commands are shown here.

10.1 Historical Log (historical_log)

This table is always present.

10.1.1 For MySql

```
CREATE TABLE historical_log (
    index_number int(8) unsigned NOT NULL auto_increment,
    date_time datetime NOT NULL default '0000-00-00 00:00:00',
    mSec int(3) NOT NULL default '0',
    device_name varchar(100) default '0',
    text varchar(100) default '',
    level int(1) default '0',
    state int(1) default '0',
    usergroup varchar(100) default '',
    process_id varchar(100) default '',
    PRIMARY KEY (index_number)
);
```

10.1.2 For SQL Server

```
CREATE TABLE historical_log (
    index_number INT NOT NULL IDENTITY(1,1),
    date_time datetime NOT NULL default '0000-00-00 00:00:00',
    mSec int NOT NULL default '0',
    device_name varchar(100) default '0',
    text varchar(100) default '',
    level int default '0',
    state int default '0',
    usergroup varchar(100) default '',
    process_id varchar(100) default '',
    PRIMARY KEY (index_number)
);
```

10.2 Process Data (process_data)

This table is always present.

```
CREATE TABLE process_data (
    process_id varchar(100) NOT NULL default '',
    date_time datetime NOT NULL default '0000-00-00 00:00:00',
    mSec int NOT NULL default '0',
    current_state int default '0',
    current_text varchar(100) default '',
    device_name varchar(100) default '',
    current_level int default '0',
    usergroup varchar(100) default '',
    PRIMARY KEY (process_id)
);
```

10.3 Device Details

This table is not required, but is listed here as an example of further data that could be held.

```
CREATE TABLE device_details (
    device_name varchar(100) NOT NULL default '',
    building varchar(100) default '',
    room varchar(100) default '',
    bay varchar(100) default '',
    rack varchar(100) default '',
    slot varchar(100) default '',
    manufacturer varchar(100) default '',
    model varchar(100) default '',
    serial_no varchar(100) default '',
    usage varchar(100) default '',
    user_info varchar(100) default '',
    contact varchar(100) default '',
    web_link varchar(100) default '',
    PRIMARY KEY (device_name)
);
```

10.4 Contact Details

This table is not required, but is listed here as an example of further data that could be held.

```
CREATE TABLE contact_details (
    contact varchar(100) NOT NULL default '',
    name varchar(100) default '',
    address1 varchar(100) default '',
    address2 varchar(100) default '',
    address3 varchar(100) default '',
    tel1 varchar(100) default '',
    tel2 varchar(100) default '',
    email varchar(100) default '',
    misc varchar(100) default '',
    PRIMARY KEY (contact)
);
```

11 Appendix B – MySQL

11.1 Installing MySql

The MySQL Server installer provides a command-line tool which may be used for most of the necessary configuration.

MySQL Workbench is a separate install and provides a GUI-based means of creating servers and users and executing SQL commands.

Follow the instructions to install the Server and any other applications required.

It will be necessary to create and configure a server and a user. Note that the settings for a user specify which client addresses may connect using that user-name, and privileges may be granted on a per-host basis. It is necessary that these are set to permit the computer running the configuration editor to connect and perform the relevant operations.

New historical log and process tables may be created using the BNCS configuration tool.

The database itself may not be created from the BNCS Config Editor but must be done directly using one of the MySQL tools.

11.2 Permissions

In order to create the database and the tables the MySQL server needs the required user to have Create permission from the client (ie the one running the config editor).

In order to write to the database the server needs the required user to have Insert and Alter permissions from the client (ie the one running the alarm system).

11.3 Passwords – Old and New Formats

The MySQL database driver which is now in use expects the server to support the current format of passwords (also known as "new" or "long"). Earlier versions of the library support the old format ("old", "short", "16 character" or "pre 4.1"). See the version history to ascertain which version applies. See the MySQL documentation if it is necessary to set a recent server to accept the old format.

This is controlled by the DLL windows/lib/libmySQL.dll.

If it is version 5.6.20 then the new format is in use.

It is not clear what the version should be for the old version.

Atos IT Services Limited
4 Triton Square
Regent's Place
London NW1 3HG, UK
<http://uk.atos.net/>

BNCS
Room G300
Stadium House
Wood Lane
London W12 7TA
collediacontrol.it-solutions.gb@atos.net