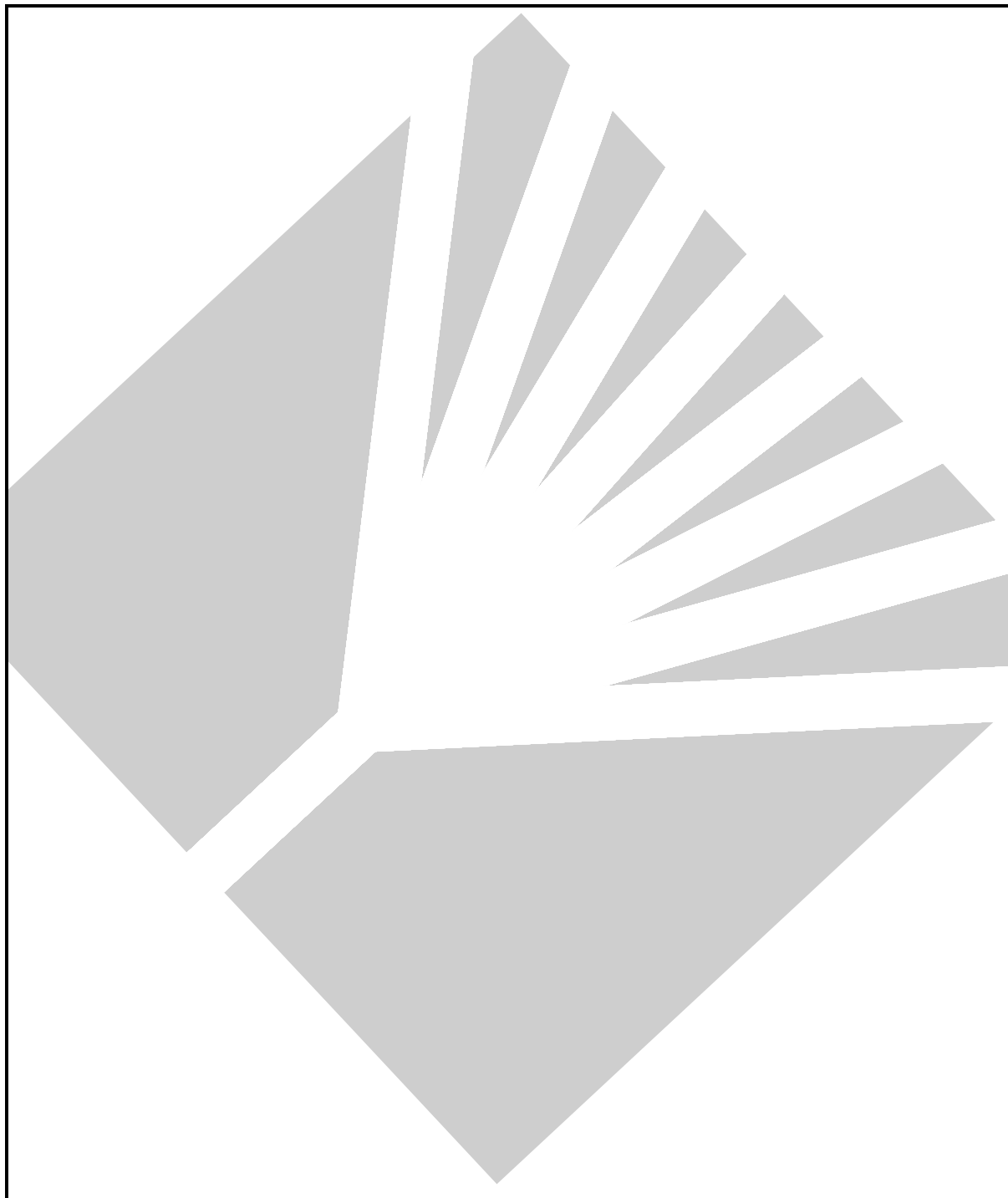


MTL8000 – Configuration Software

Installation and operation



Instruction Manual

INM8455



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INM8455-2 APRIL 2002

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Introduction

This manual explains how to install and use the MTL8455 – Bus Interface Module-Configuration Software.

The manual is divided into the following topics:

- The Software Function
- The User Interface
- The Application Controls
- Tasks (How to...)
- Glossary of Terms

It should be used in conjunction with the manuals for the specific models of MTL8000 BIMs and the individual data sheets for the range of MTL8000 Process I/OTM modules.

MTL publications:

INM8502 – Profibus-DP BIM instruction manual.

INM8505 – Modbus BIM instruction manual.

Process I/O module data sheets by product number.

The manuals contain information about the individual BIMs, the bus protocols they use and how their data is mapped. The I/O module data sheets provide additional information on the performance and parameters available for each module.

Overview

The MTL8455 BIM Configuration Software (also referred to as the “Configurator”) is a Microsoft Windows application that runs on a standard PC under a Microsoft Windows 95, Windows 98, Windows 2000, Windows XP or Windows NT4 operating system. The PC must then be linked via one of its serial ports to the configuration port of the Bus Interface Module. Where a secondary LAN connection is available to the BIM it may also be configured remotely via this port.

Purpose

The Configurator is used to create configuration files for Version 2.xx BIMs using system parameters selected by the user. This file can then be passed from the PC, via a serial link (or a LAN), to the BIM. The BIM is unable to operate effectively until this configuration file is in place. The file passed to the BIM will overwrite any previous file and provide a fresh set of parameters but will not be permanent until the file is saved to the BIM’s non-volatile-memory.

The configuration file performs a number of vital tasks.

- It instructs the BIM about the modules it is controlling,
- It instructs the modules regarding their environment and function
- It defines how the BIM should talk to the host
- It defines how the BIM and the modules should behave in the event of a loss of command communications
- It provides a migration path between versions by enabling users to import .csv files from Version 1.xx BIMs in order to create Version 2.xx configuration files.

Software function

Overview

The principal use of the software is to create configuration files for the Bus Interface Modules. This involves selecting a BIM that matches the network protocol and then specifying I/O modules that the BIM will supervise.

Editing functions are provided to add or delete BIMs or I/O modules. Each of these modules is then configured to define individual operating parameters. The sort of parameters that can be defined include: the type of sensors connected to the modules; the parameters the modules will adopt on start-up; the state or value each channel will present when a module enters a failsafe mode; the alarm levels for individual channels and whether the channel is active or not.

When connected to a live system, the software can also monitor channel data and display the status of individual modules, so that information is available for diagnostic purposes. It can also be used to test some of the system functions.

When the configuration file has been defined, it can be downloaded to the BIM and saved in its non-volatile memory (NVM). This enables the BIM to load this configuration when starting from initial switch-on. If the file is not saved to NVM, the information will be lost when power is removed from the BIM, i.e. when the system is powered down or the BIM is removed.

A configuration file can also be uploaded from a BIM. This file can be edited and saved and then downloaded to other BIMs.

Configuration files

Configuration files have a .cfg file extension and are held in binary format. Files can be viewed and edited without the need for a BIM to be connected. This enables “offline” construction and editing to be carried out. They can then be stored and called up as required.

Files produced with the earlier 8450 Configurator can also be imported into the 8455 Configurator and then edited in the same way as files that are initially created in the 8455.

BIM management

Other than commands it receives from the host, the BIM is controlled by the firmware that it contains. This firmware is contained in flash memory, which means that it can be updated as newer versions of the software are developed.

I/O module management

Like the BIM, the analog I/O modules contain firmware in flash memory. This firmware can be changed or updated, as required, by copying the revised firmware file to the module using the 8455 Configurator.

Event log

The Configurator software also contains an Event Log facility. This provides historical information about significant events for the BIM and I/O modules. The Event Log is capable of recording error conditions that occur as well as status changes.

The User Interface

Overview

This section describes how to prepare the software and equipment for use and introduces the user to the interface and controls that will be encountered when using the 8455 Configurator application.

The topics include:

- Installing the software
- Connecting to the BIM
- Starting the application
- The application screen

The following section deals with the application controls and how they are set.

Installing the software

The software is available on a CD from MTL and can be installed on any PC running Microsoft Windows 95, Windows 98, Windows 2000, Windows XP or Windows NT®. The standard installation requires < 1Mb of hard disk space but space will be needed also for any configuration files created. Upgrades to the software are available from the MTL web site (www.mtl-inst.com)

It is advisable to close all other applications before running the installation wizard. Follow the instructions provided with the CD and the installation wizard will start.

Note: At any time before the files are copied to the computer the user may retrace one or more steps in the wizard by clicking on the **Back** button as many times as required.

Click **Next** then fill in the Name, Company name and the Product Serial number. Click **Next** and the wizard will display the location on the computer hard drive where it will install the software. If this default location is not suitable, click the **Browse** button and nominate an alternative. Click **Next** to define the type of installation required:

- Typical – Loads all files likely to be required
- Compact – Loads the minimum of files to run Configurator
- Custom – Offers a choice of components for installation

Note: The first time user is advised to continue with the default “Typical” installation. This option will automatically load files for the Microsoft Data Access Components which are used to manage the configuration database.

Click **Next** and a default name for the program folder icon is offered. Accept this as MTL unless an alternative name is required; in which case enter an alternative or choose from the existing list provided.

Click **Next** to begin the installation proper. When the installation is complete a further dialog box will announce this. Click **Finish** to complete the task. The user is strongly advised to read the **readme.txt** file that is copied to the application folder.

Connecting to the BIM

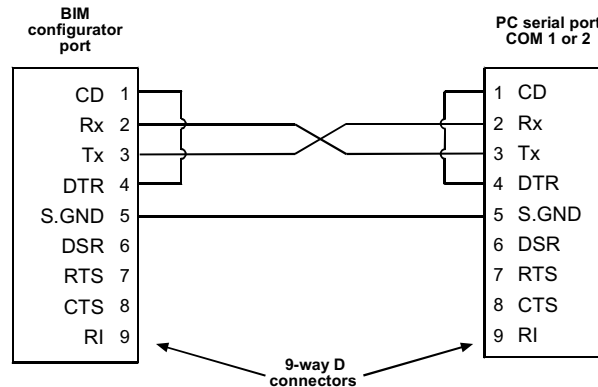
The Configurator PC can be connected to the BIM via a suitable serial data cable. The Modbus BIM (8505) has another alternative, which enables a remote connection via the secondary, or redundant, network to the node's LAN B terminals.

Local connection

The BIM's RS232 Configurator port is located on its end (top) face in the form of a flush-mount, male, 9-pin, sub-miniature, D-type connector. An interconnecting cable is required from the BIM to any serial port (COM1 to COM4) on the PC running the configuration software.

Such a cable is available from MTL (Part No. 8460-CA-CF). The wiring for this cable is shown in Figure 1.

Figure 1 - Local configuration cable link

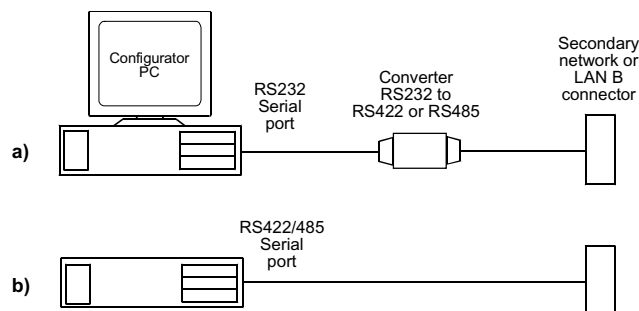


Pins 2 and 3 are interconnected, in a crossed fashion, and pins 1 and 4 linked at both ends. This makes the cable symmetrical, to avoid polarity problems. The link between pins 1 and 4 prevents the BIM from going into “failsafe” mode during testing despite the absence of LAN communication; although, there is a software override for this if the cable is used to connect the BIM to an 8512 HART interface. See **Failsafe with Config** on page 24.

Remote connection (Modbus BIM only)

This is the alternative to local connection and allows the user to configure multiple BIMs, connected to the secondary network, from a single location. This is useful for sites where the MTL8000 nodes are widely distributed across a large area or in a hazardous location. The Configurator enables the user to select individual BIMs for configuration.

Figure 2 - Connection options for LAN B



The PC running the Configurator should be connected, through an RS232 to RS485 (or RS422) converter (option a above), to the secondary network. Alternatively, an RS485 or RS422 port could be installed in the PC (option b). Although termed a *remote* configuration option, the PC can also be attached to the node locally via the same type of converter.

Starting the application

The main methods of starting the Configurator are as follows:

Starting with the **Start** button at the left hand end of the Taskbar, use the following sequence:

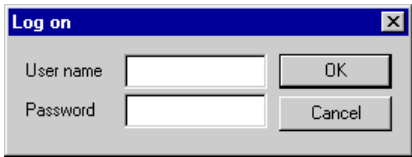
Start | Programs | Mtl | MTL8000 Configurator

Alternatively, for convenience, a shortcut icon can be added to the computer desktop. Double clicking this icon will start the Configurator application. (If necessary, see the Windows Help file for creating desktop icons.)

The Log on screen

On starting the Configurator, the first user screen is the Log on dialog box. This requires a user name and password.

Figure 3 - Log On screen



For first time users the default entries are:

User name: **admin**
Password: **admin**

The password entry always appears as a set of asterisks to prevent an onlooker from seeing the password typed on screen. The name and password are not case sensitive, i.e. admin, ADMIN and Admin will all permit the user to log on.

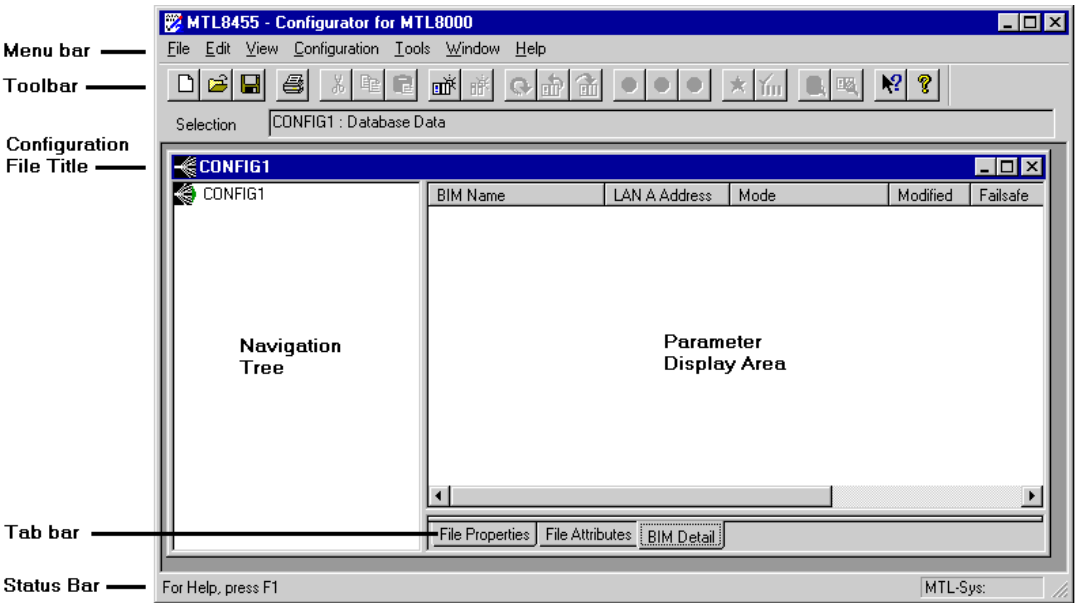
The system administrator should change this password at the earliest opportunity to prevent access by unauthorised users. See the later section dealing with Security.

Note: If the **Cancel** button is clicked, the application will start but will remain in “Read Only” mode until a user with greater access rights logs in.

The application screen

When the Configurator is started it opens with a blank screen

Figure 4 - The main application screen



Menu bar

The Menu bar is the conventional Windows method of providing the user with a range of application controls.

Figure 5 - Menu bar



The menu titles are arranged across the top of the application window. By positioning the mouse pointer on any of title words and then clicking the left mouse button, a drop-down menu appears with a range of appropriate options.

Toolbar

The Toolbar provides a set of shortcut buttons for commonly used application controls.

Figure 6 - The application toolbar



These buttons can be used as shortcuts for some of the menu controls. See page 18 for a description of the Toolbar buttons.

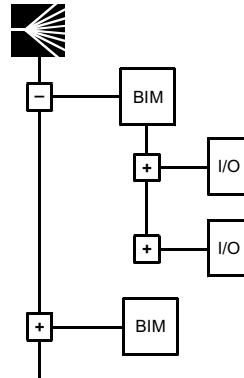
Configuration file display

Each configuration file display is split into two sections, the Navigation Tree and the Parameter Display Area.

Navigation tree


The Navigation Tree provides a convenient visual method of working with the individual components of the system. The network is presented with the BIMs and I/O modules connected to it – shown as icons. The I/O link (LAN) runs vertically with the attached BIMs branching to the right and any I/O modules branching further right from the BIM. See Figure 7.

Figure 7 - Navigation tree



Right clicking the mouse on any of the icons in the Navigation Tree will reveal menu options appropriate to the item clicked. For example, right clicking on a BIM icon will offer, among other things, the option to add I/O modules to that BIM or download the configuration file to it.

Parameter display area

The parameter display area contains the information relating to the item highlighted in the Navigation Tree. If the System/Network icon  is highlighted, then the tabs in the parameter display area will relate to network parameters – see **Tab Bar**.

Tab Bar

The Tab Bar displays a set of tabs corresponding to the item selected in the Navigation Tree.

Figure 8 - System/Network tabs



Figure 9 - BIM tabs

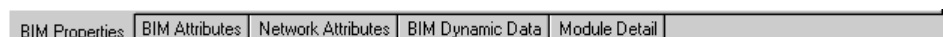
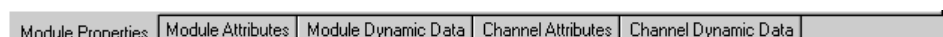


Figure 10 - Module tabs



Selecting a tab will present the related set of parameters. See the Control Screen section for details of the individual tabs.

Status Bar

The Status Bar lies along the bottom edge of the application window and provides help and status information to the user at various stages.

Figure 11 Status bar



The left-hand end displays messages that relate to menu and toolbar controls. As each toolbar icon or menu item is highlighted an explanatory message appears in this area of the Status Bar.

The Application Controls

This section describes the controls available on the Configurator. These include:

- Certain Windows controls that the user will need to know,
- The Application Menus,
- The Toolbar and
- The Screens that appear at various stages.

Each is described in detail with recommendations on the best way to use the Configurator.

Windows controls

A range of standard Windows controls is used in the Configurator. To ensure that the user is familiar with the specific ones that it uses, a brief description is provided here.

Text boxes

A Text box allows the user to enter standard ASCII text characters and numerals - also referred to as alphanumeric characters.

Figure 12 - A Text box



A text box will accept a certain number of characters. The maximum for each control is defined in this manual.

If the Configurator Mode is set to Manual or Auto and the current text is changed, the background colour of the text will change to blue. This indicates that the displayed text is different to the text currently held in the BIM.

List boxes

Where the user is permitted only a specific range of options for a control, a drop-down list box is used to make the selection.

Figure 13 - A List box



When the down arrow, on the right of the box, is clicked with the mouse, a list of the available options is displayed.

Figure 14 - List box showing options



The current selection is highlighted but the user can select another option by clicking on it with the mouse.

If the Configurator Mode is set to Manual or Auto and the current option is changed, the background colour of the text will change to blue. This indicates that the displayed option is different to the one currently held in the BIM.

Up-Down Controls

As their name suggests, these allow the user to vary the value in a field up or down by using the arrow buttons on the right of the box.

Figure 15 - Up-Down control box



In addition to using the arrows, a new value can be entered by clicking in the box and editing the value using the keyboard.

If the Configurator Mode is set to Manual or Auto and the current value is changed, the background colour of the text will change to blue. This indicates that the displayed value is different to the one currently held in the BIM.

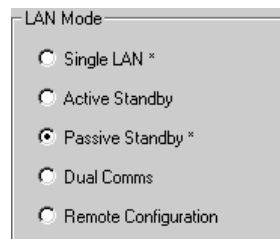
Check boxes

Check boxes are toggle switches. They can be checked ☒ to confirm a command or state, or they can be unchecked ☐ for the opposite effect. Click in the box to check or uncheck.

Radio buttons

Radio button controls are also used to select from a range of options. Unlike **List boxes**, *all* of the options are always visible.

Figure 16 - Radio button selection boxes



Only one of the options can be chosen and this is done by clicking on it. The selected option is indicated by a black dot in the circular box.

If the Configurator Mode is set to Manual or Auto and the option is changed, asterisks will appear beside the current selection and the previous selection, as shown in the picture above. This is to indicate that the other selection, and not the current one, is the one held in the BIM.

Greyed-out fields and controls

Sometimes controls are not available to the user under certain conditions. The field or control is then shown in grey. Examples of a greyed-out text box and list box are provided below.

Figure 17 - Greyed-out fields



These fields cannot be edited but the current value is displayed for information.

The Menus

The menuing system will be familiar to most Microsoft Windows users, especially as some are shared by many other Windows applications, for example, the File menu, the Windows menu and the Help menu. Others are more specific to the operation of the Configurator and these are explained at each step.

Unavailable menu items

Some of the controls will appear greyed-out at certain times or may not be visible at all. This is because their functions are not applicable at that specific stage. When appropriate, they will appear, or cease to be greyed-out and will become fully functional.

Some other controls are still under development and will remain “greyed-out” at *all* times. These controls are identified in this manual.

Right-click menu items

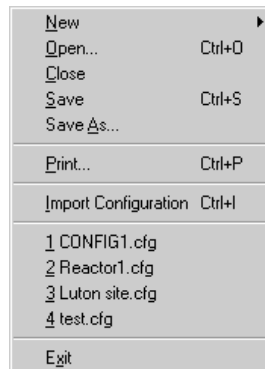
Quite often, especially when working in the Navigation Tree, see later, a click on the *right* mouse button will open a menu for the user.

Tip: Try pointing at an item in the Navigation Tree area and right clicking. The menu that opens will be specific to the item being pointed at.

Keyboard shortcuts

Where available, keyboard shortcuts are shown alongside the menu items. These indicate keyboard methods of achieving the same result as a series of mouse clicks.

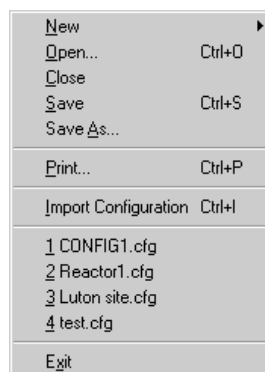
Figure 18 - Keyboard shortcuts



The above example shows that, instead of using the mouse to click on the File menu and then clicking on Save, a simple keyboard method is available. Holding down the “Ctrl” (Control) key while striking the “S” key will achieve the same result. Users with a preference for using keyboard shortcuts should find these useful.

File Menu

Figure 19 - File menu



New

This is used to create a new configuration file, add a new BIM or a new I/O module. Move the mouse pointer over this option and another sub-menu appears which offers: File, BIM or Module.

New | File

Use this option to create a new configuration file.

See **Creating a configuration file** on page 43.

New | BIM


This is used to add a new BIM to an existing configuration file.

See **Adding a BIM** on page 50.

New | Module

This is used to add a module to the node currently selected in the Navigation Tree.

See **Adding a module** on page 51.

Note: This option is not available if the user is at file level, i.e. with the  symbol highlighted in the top left corner of the Navigation Tree. Click on a BIM or module symbol to make it available.

Open

This enables the user to select a file for opening. See **Opening an existing configuration file** on page 44.

Close

This option closes the current configuration file without closing the application. If the file has been changed but not saved, the user is prompted to save it.

Save

The Save option saves the current file to disk. If the file has not been saved previously, the Save As... dialog box will appear for the user to choose a storage location. For more details, see **Saving a configuration file** on page 45.

Save As...

This option is used when saving a previously unsaved file, or if the user wants to save the current file to a new disk location. For more details, see **Saving a configuration file** on page 45.

Print

This provides a printout of the configuration file parameters, which include:

- BIM attributes
- Network attributes
- Module attributes
- Channel attributes by slot number

Click on Print and a print dialog box will appear so that the printer details can be modified, if required. Click on OK to execute the print command.

Import configuration

This option enables a user to import a configuration file in .csv or .ssf format. These formats were standard options for the earlier MTL8450 Configurator.

Recent Files

This part of the File menu shows a list of the most recently opened configuration files. It is a convenient shortcut to re-open them. Click on a file name to open it.

Exit

Use this to close the 8455 Configurator.

If there are any configuration files open, that have been modified but not saved, a warning appears, "Save changes to xxxx.cfg?". Choose Yes, No or Cancel, as appropriate.

Edit Menu

Figure 20 - Edit menu

**Undo**

This option is reserved for future development.

Cut

This option is reserved for future development.

Copy

This option is reserved for future development.

Paste

This option is reserved for future development.

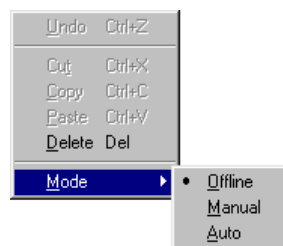
Delete

Use this option to delete a BIM or I/O module. See Deleting a BIM in the task section.

Mode

Use this to change the mode of the Configurator. The options are Offline, Manual or Auto.

Figure 21 - Mode selection

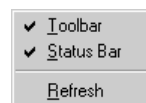


The current mode is indicated by a black dot, see Figure 21 above. As an alternative to using the Edit Menu, the user can click on the Toolbar icons to change the mode.

See **Changing the Configurator mode** on page 46.

View Menu

Figure 22 - View menu

**Toolbar**

This is a toggle switch for viewing the Toolbar. When the Toolbar option on the menu has a tick (a check mark) against it, then the Toolbar will be visible. To change the current state drop down the View menu and click on Toolbar.

Status Bar

This is a toggle switch for viewing the Status Bar. When the Status Bar option on the menu has a tick (a check mark) against it, then the Status Bar will be visible. To change the current state drop down the View menu and click on Status Bar.

Refresh

When in Manual or Auto mode (see Edit menu for details of the modes) this option will cause the Configurator to update its record of BIM variables.

Configuration Menu

This menu deals specifically with the BIM and requires direct communication; consequently, the options are available only when the Mode is set to Manual or Auto.

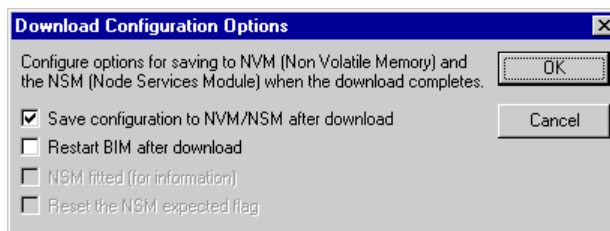
If the Mode is set to Offline, the options will be “greyed out”.

Figure 23 - Configuration menu**Upload BIM**

Use this option to upload the current configuration from a BIM to the Configurator. This option is not available when in Offline mode. See **Uploading BIM parameters** on page 45.

Download BIM

Use this option to download the current configuration file to a BIM. This option is not available when in Offline mode.

Figure 24 - Download configuration options

The check boxes provide both choices and information.

Save configuration to NVM/NSM after download

Check ☒ this to save the configuration to NVM (and NSM if fitted)

Restart BIM after download

Check ☒ this to restart BIM on completion of download

NSM fitted (for information)

This indicates whether there is an NSM fitted to the node and is for information only.

Reset the NSM expected flag

If this option is available, i.e. not greyed out, it indicates that an NSM had previously been present but has now been removed. Check this box if the NSM is **not** going to be replaced.

See also **Downloading a new configuration to the BIM** on page 48.

Force

This option is reserved for future development.

Unforce

This option is reserved for future development.

Set Active Channel

This option is reserved for future development.

Special I/O Commands

This option is reserved for future development.

Reset

This command performs a software reset on the I/O module or the BIM.

See **Resetting the BIM** on page 51 and **Resetting a module** on page 52.

Set Failsafe

Use this command to force a BIM or an I/O module into the failsafe state.

See **Setting and clearing BIM failsafe state** on page 51 and **Setting and clearing I/O module failsafe state** on page 52.

Clear Failsafe

Use this command to take a BIM or an I/O module out of the failsafe state.

See **Setting and clearing BIM failsafe state** on page 51 and **Setting and clearing I/O module failsafe state** on page 52.

Reprogram

Where appropriate, this enables the firmware in the analog I/O modules to be changed.

Figure 25 - Module Firmware Download

Versions		
Description	Current	New

BIM

This shows the current BIM type. This field is not editable.

Module

This shows the type of the selected module.

H/W Version

This is the hardware version of the selected module.

Firmware Version

This provides a drop-down list of the module firmware versions available on the system.

Versions

This displays the selected software module with the following fields:

Description

The name of the software module

Current

The version number for the software currently installed in the I/O module

New

The version number of the software indicated by the **Firmware Version** field.

Status

This indicates whether the software revisions are different:

- **“Not selected”** – indicates that the module software version is the same as the one currently loaded
- **“To be downloaded”** – indicates a module version different to the one currently loaded.

Select Latest button

This button selects the latest version of the firmware from the list of firmware available.

See also **Upgrade analog module firmware** on page 55.

Program EEPROM

This option is currently unsupported.

Event Log

Use this option to view the Event Log. The data must be read from the BIM and so this feature is available only when the Mode is set to **Manual** or **Auto**.

Calibrate...

This option is reserved for future development.

View Data in BIM

The user can toggle between this option and the **View Data in Database** option.

Choose this option to view the data contained in the BIM instead of the data that is currently in the Configurator database.

The option is available only when the application recognises that the BIM data and the Configurator database are different.

View Data in Database

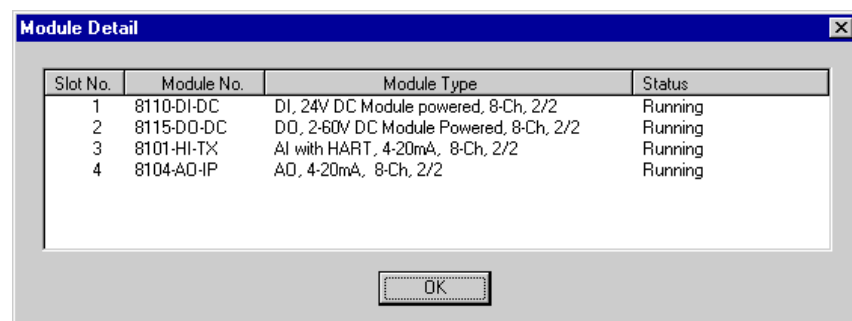
The user can toggle between this option and the **View Data in BIM** option.

Choose this option to view the data currently contained in the Configurator database instead of the data in the BIM.

The option is available only when the application recognises that the BIM data and the Configurator database are different.

Show Modules in BIM

Figure 26 - Module details box



Slot No.	Module No.	Module Type	Status
1	8110-DI-DC	DI, 24V DC Module powered, 8-Ch, 2/2	Running
2	8115-DO-DC	DO, 2-60V DC Module Powered, 8-Ch, 2/2	Running
3	8101-HI-TX	AI with HART, 4-20mA, 8-Ch, 2/2	Running
4	8104-AO-IP	AO, 4-20mA, 8-Ch, 2/2	Running

OK

This menu item causes the BIM to review the modules it has attached and list them with their current status. The details are displayed in an on-screen box, shown above. Click the OK button to remove the box.

Tools Menu

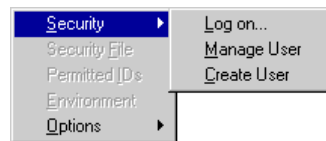
The Tools menu contains options that deal with access to the software and its facilities. Some of these options are reserved for future development.

Figure 27 - Tools menu



Security

Figure 28 - Security options



Log on

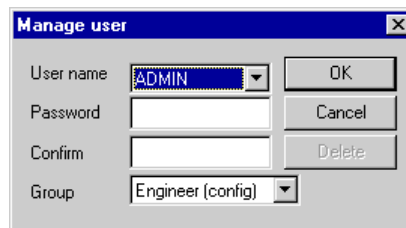
This enables a registered user to log on without having to close down the application. The name of the new user appears at the right of the Status Bar and replaces the previous one.

See also **The Log on screen** on page 4.

Manage User

Use this to edit the password or access level (Group) of an existing user.

Figure 29 - Manage users dialog



User name

A drop down list containing the names of all registered users.

Password

The user's password. If this is changed then the next field, i.e. **Confirm**, must also be completed.

Confirm

This field is used to confirm a *new* password. This field must contain the same characters as the password field for the new password to be accepted.

Group

A hierarchy of user levels exists. This enables users to be allocated an access level suited to their level of responsibility. This ensures that significant changes cannot be made accidentally by users who are unsure of what they are doing. See **Security access levels** in Appendix C. The access categories are as follows:

Table 1 - Security access categories

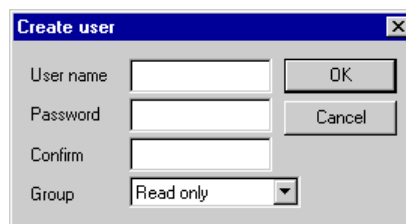
Access category	
Engineer (config.)	highest
Engineer (no config.)	
User Technician	
Read Only	lowest

A user must be a Engineer (no config), or above, to create another user.

Create User

Use to add a new user to the site. Define password and access level (Group).

Figure 30 - Create users dialog



User name

Entry field for name of new user.

Password

The password for the new user.

Confirm

This field is used to confirm the password. This field must contain the same characters as the password field for the new password to be accepted.

Group

A hierarchy of user levels exists. This enables users to be allocated an access level suited to their level of responsibility. This ensures that significant changes cannot be made accidentally by users who are unsure of what they are doing. See **Security access levels** in Appendix C. The access levels are as follows:

Table 2 - Security access categories

Access category	
Engineer (config.)	highest
Engineer (no config.)	
User Technician	
Read Only	lowest

A user must be a Engineer (no config), or above, to create another user.

Security File

This option is for factory use and not required by other users.

Permitted Ids

This option is for factory use and not required by other users.

Environment

This option is reserved for future development.

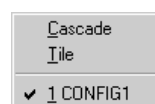
Options

This option appears only when a configuration file is open and is reserved for future development.

Window Menu

The Window menu contains two options plus a list of files currently open. The options are used to arrange on the screen the currently open files.

Figure 31 - Window menu

**Cascade**

Cascade arranges the open files in layers on top of each other.

Tile

Tile arranges all the open files in a tiled pattern within the application window.

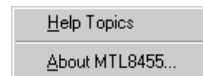
Currently open files

The list shows the names of the files that are currently open. The one currently in view has a check mark next to it.

Help Menu

The Help menu has two options, providing access to the Help topics and information on the application version and contact details.

Figure 32 - Help menu



Help Topics




















This provides access to the application help file. This is a standard Windows help file with Contents, Index and Find options.

About MTL8455

This provides information on the application version and release level. It also provides contact details for sales and technical enquiries.

The Toolbar

The Toolbar provides shortcut buttons for a number of application controls. The ones marked with an asterisk '*' are currently not implemented.

	Create new configuration file		Refresh data (Manual mode only)
	Open an existing file		Upload configuration from BIM
	Save the current file		Download configuration to BIM
	Print from the current file		Set Offline mode
	Cut the selected item*		Set Manual mode
	Copy the selected item *		Set Auto mode
	Paste item from the Clipboard *		Show database data
	Add a new BIM		Show BIM data
	Add a new I/O module		Help topics
			About the software

The Control Screens

A configuration file contains a range of parameters dealing with networks and communications, BIMs and I/O modules. This section describes the control screens within the application that display these parameters. Each screen is selected by clicking on the appropriate tab in the Tab Bar.

Network and file level

This is the level that is presented when a user opens a configuration file or creates a new one. Three tabs are presented at the bottom of the application screen.

Figure 33 - Network and File tabs



File Properties tab

This tab is used to view the physical properties of the configuration file.

Figure 34 - File Properties

File Properties

File Name: C:\Program Files\MTI8455\CONFIG1.cfg

Date: 12 March 2001 Last User Name: admin

File Size: 408 kB Time: 17:16:18 Network Type: Mk1/Turbo BIM Network

Details include its name, size, the type of network it serves, when it was last saved and by whom. These details are not editable.

File Attributes tab

This tab contains range of fundamental parameters that define the file and the network parameters.

Figure 35 - Project name and details

Project: CONFIG1

Project Detail:

Project

This can be used to allocate a name to the Project. It will accept a maximum of 200 alphanumeric characters.

Project Detail

Use this text area for additional project details. It accepts a maximum of 250 alphanumeric characters.

Figure 36 – BIM type and Auto store

BIM Type: MTL8505 V2 Modbus BIM ☐ Automatic store to NVM

BIM type

This is a non-editable description of the BIM type.

Automatic store to NVM

If this box is checked ☒, any download to the BIM will be stored to NVM automatically.

Configuration port parameters**Figure 37 - Configuration port parameters**

Configuration Port Parameters

PC Port: COM 1

BIM Port: Local - Configurator Port

PC Port

This must define the PC COM port that will be connected to the BIM configuration port. The drop down list offers a choice of COM 1 to COM 8.

BIM Port

This field is used to specify whether the BIM is being configured locally, via the Configurator Port or remotely, via LAN B.

Note: When using the Profibus-DP BIM, the field is set automatically to “Local-Configurator Port” because there is no LAN B.

LAN A Parameters

Figure 38 - LAN parameters

Modbus		Profibus	
LAN A Parameters			
Protocol	Modbus	Protocol	Profibus
Baud	9600		
Parity	Even		
Stop Bits	1		
Data Bits	8		

Protocol

This displays the protocol in use. It is not editable because the protocol was defined when the configuration file was created.

Baud (Modbus only)

This defines the communication rate for LAN A (and LAN B, where available). Choose from 1200 to 115200 baud using the drop-down list.

Parity (Modbus only)

This defines the communications parity bit setting. Choose from None, Odd or Even (default)

Stop Bits & Data Bits (Modbus only)

These fields display the number of stop and data bits used for communications. These fields are not editable.

BIM Detail tab

BIM Name	LAN A Address	Mode	Modified	Failsafe	BIM State	Comms Lost Timeout (Secs.)
Node One	1	Manual	No	No	OK	30

This tab provides a list of the BIMs configured in the current file. Each additional BIM added to the file will have an entry in this list.

The BIM parameters displayed in this list are as follows.

Parameter	Meaning
BIM Name	The name allocated to the BIM by the user.
LAN A address	The address of the BIM on LAN A.
Mode	The data refresh mode – Offline, Manual or Auto.
Modified	Indicates whether the BIM parameters in the PC database file are different to those saved in the BIM.
Failsafe	Indicates whether the BIM is in failsafe mode, or not.
BIM state	OK or Error – indicate current BIM state.
Comms. lost timeout	The period, in seconds, before the BIM goes into failsafe mode after losing communications with host.

BIM level

When a BIM is selected in the Navigation Tree the following five tabs appear in the Tab Bar.

Figure 39 - BIM level tabs

BIM Properties	BIM Attributes	Network Attributes	BIM Dynamic Data	Module Detail
----------------	----------------	--------------------	------------------	---------------

Clicking on a tab will display the named screen.

BIM Properties tab

Figure 40 - BIM properties tab

Bim Properties

Composite

Product Software Hardware

MAU Card

Product Software Hardware

Bim Core

Product Software Hardware

Vendor IDs in the BIM

This tab displays the release information for the software and hardware component parts of the BIM and also identifies the BIM vendor. The BIM **must be on line** for the Configurator to read this information.

A BIM comprises two basic parts, the BIM Core and the MAU; together they form a Composite which also has its own release level.

BIM Attributes tab

This tab shows the current BIM settings and enables the user to modify some of its key parameters. It is divided into two areas, BIM Details and Configuration Port Parameters.

BIM Details

Figure 41 - BIM Details

BIM Details

Name

Type

Product Code

Mode

☒ Offline ☐ Manual ☐ Auto

Event Acknowledge

Halt/Restart Mode

Host Pending TO secs.

Railbus Pending TO secs.

Modified

Name

This is an editable text box where the user can enter or edit an appropriate name for the BIM. The field will accept up to 22 alphanumeric characters.

Type & Product Code

These fields display the type of BIM and its product code.

Event Acknowledge

This indicates that “All” module events will be acknowledged by the BIM. This is not editable.

Halt/Restart Mode

The BIM continually checks its own systems for errors. If it detects a serious error, e.g. software corruption, then it will adopt the action defined in this field – i.e. Halt or Reset.

Host Pending TO

This is the Host Pending Timeout. It is a parameter reserved for future development. Its default value is 10 seconds. The user is advised not to modify this value unless instructed by an MTL Engineer.

Railbus Pending TO

This is the Host Pending Timeout. It is a parameter reserved for future development. Its default value is 3 seconds. The user is advised not to modify this value unless instructed by an MTL Engineer.

Modified

The Configurator displays data that it has uploaded from the BIM but also retains a reference copy. If the user modifies any of the displayed parameters then the Configurator recognises this and changes this indicator from No to Yes.

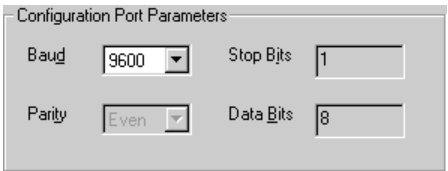
The user will also see parameter changes presented on a cyan (light blue) coloured background.

Mode

While it is connected to the Configurator, the BIM can continue to monitor the I/O modules and the LAN. The Mode options define when the Configurator will update its variables from the BIM. See Edit Menu for details of these mode settings.

Configuration Port Parameters

Figure 42 - Configuration port parameters



The screenshot shows a dialog box titled "Configuration Port Parameters". It contains four settings: "Baud" is a dropdown menu set to "9600"; "Stop Bits" is a text box containing "1"; "Parity" is a dropdown menu set to "Even"; and "Data Bits" is a text box containing "8".

Baud

This field is used to set the baud rate for the configuration port. The drop-down list box offers a range of 1200 to 19200 baud.

Parity, Stop Bits & Data Bits

These fields display the other communications parameters for the Configuration port. The values can not be edited.

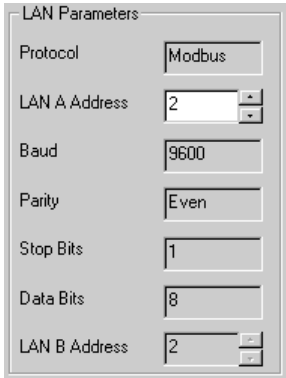
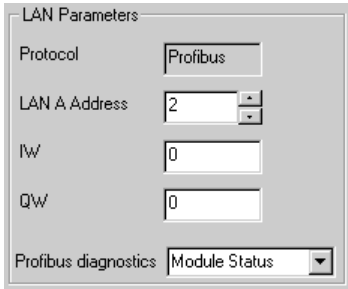
Network Attributes tab

This screen enables the user to view the network parameters and edit some of them. The screen is divided into a number of sections which are sometimes interdependent, i.e. changing a parameter in one section causes a parameter change in another section.

LAN parameters

This reflects the parameters that have been set for the network but allows the user to define the address for the BIM. The fields and values displayed depend on the BIM being used.

Figure 43 - LAN parameters

Modbus BIM	Profibus BIM
 <p>The screenshot shows a dialog box titled "LAN Parameters" for the Modbus BIM. It contains the following settings: "Protocol" is a dropdown menu set to "Modbus"; "LAN A Address" is a text box with a spinner set to "2"; "Baud" is a text box set to "9600"; "Parity" is a dropdown menu set to "Even"; "Stop Bits" is a text box containing "1"; "Data Bits" is a text box containing "8"; and "LAN B Address" is a text box with a spinner set to "2".</p>	 <p>The screenshot shows a dialog box titled "LAN Parameters" for the Profibus BIM. It contains the following settings: "Protocol" is a dropdown menu set to "Profibus"; "LAN A Address" is a text box with a spinner set to "2"; "Iw" is a text box set to "0"; "Qw" is a text box set to "0"; and "Profibus diagnostics" is a dropdown menu set to "Module Status".</p>

Protocol

This field is not editable. It is defined when the configuration file is created.

LAN A Addresses

This field can be modified to change the address of the BIM on LAN A. Values in the range 1 to 247 are permitted.

Baud

This is the speed chosen for transfer of LAN data. It is not editable in this view. See **File Attributes tab** to change the speed.

Parity

The type of parity checking used – None, Odd or Even. This field is not editable. See **File Attributes tab** to change the parity.

Stop Bits & Data Bits

The number of stop bits and data bits used. This field is not editable.

LAN B Address

This is the address of the BIM on LAN B. It will automatically adopt the same address as LAN A but may be altered by the user if required. Values in the range 1 to 247 are permitted. Click on the up or down arrows to obtain the required setting.

Protocol

This field is not editable. It is defined when the configuration file is created.

LAN A Addresses

This field can be modified to change the address of the BIM on LAN A. Values in the range 1 to 125 are permitted.

IW

This shows the length of the input telegram. The value displayed is the one uploaded from the BIM. The user may enter another value to specify the length of a particular telegram.

QW

This shows the length of the output telegram. The value displayed is the one uploaded from the BIM. The user may enter another value to specify the length of a particular telegram.

Profibus diagnostics

This displays the type of diagnostic information currently chosen. The options are:

- Module status
- Module status + Channel status
- Extended diagnostics (Short)
- Extended diagnostics (Long)

LAN Mode – (Modbus only)

Figure 44 - LAN mode parameters for Modbus BIM

LAN Mode

☒ Single LAN

☐ Active Standby

☐ Passive Standby

☐ Dual Comms

☐ Remote Configuration

☐ LAN B share LAN A port

Auto Change Over Timeout secs.

Use this to choose the LAN mode for the BIM at startup. A brief description of each mode is provided below.

Single LAN

In this mode, all communication is on LAN A. LAN B is disabled. Speeds up to 115.2 kbaud can be used with this mode. The Config / HMS port **is** available.

Active Standby

A redundant mode intended for use with a simple pair of duplicate hosts. A maximum baud rate of 19.2 kbaud is recommended. The Config / HMS port **is not** available.

Passive Standby

A redundant mode intended for a host pair where Host B is capable of detecting the failure of Host A, or LAN A, and taking action to assume active control. The selected data rate should not exceed 38.4 kbaud as there will be some traffic on LAN B. The Config / HMS port **is not** available.

Dual Comms

This permits two hosts to have simultaneous read/write privileges. This is appropriate for manual control via duplicate MMI/SCADA workstations. As both LANs will be run at the same speed, the data rate must be limited to 19.2 kbaud.

The Config / HMS port **is not available**.

Remote Configuration

This mode has a host connected to LAN A while LAN B is used for configuration of the BIM. The selected data rate should not exceed 38.4 kbaud as there will be some traffic on LAN B.

The Config / HMS port **is not available**.

LAN B share LAN A port

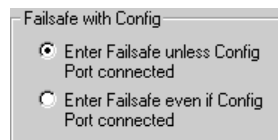
This mode can, on detection of a primary LAN fault, cause a toggle between LAN A and LAN B for the main BIM port. The other BIM port can therefore be reserved for activity such as HART maintenance.

Auto Change Over Timeout

This is also used for the Share LAN mode. This defines the time that the BIM will wait before changing to the alternative LAN after detecting a communications failure. This will always be less than the Comms Lost Timeout value to avoid the BIM adopting a failsafe mode. It cannot be set to a value equal to, or greater than, the Comms Lost Timeout.

Failsafe with Config

Figure 45 - Failsafe with Config parameters



When the BIM is being configured, the lack of LAN traffic can trigger a “Comms Lost” timeout and cause the BIM to go into failsafe. To overcome this, the insertion of the serial cable, for local configuration, automatically suspends the BIM’s ability to go into failsafe. For this mode of operation choose **Enter failsafe unless...**

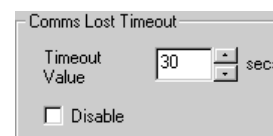
On the other hand, the BIM must also be able to operate under *normal conditions* when it has a similar cable attached to the configuration port from the 8512 HART Interface module. Under these circumstances, the BIM’s ability to go into failsafe mode must be available. For this mode of operation choose **Enter failsafe even if...**

Note: The BIM will not recognise or communicate with the 8512 module unless this second option is chosen.

Comms Lost Timeout

This section is used to specify a maximum period of inactivity on the LAN. If there is no LAN activity within the time interval set here, the BIM will assume a communications failure and adopt a failsafe mode.

Figure 46 - Comms Lost timeout parameter

**Timeout Value**

Enter a value or use the up and down arrow buttons to change the current value. The maximum available in this field is 240 secs (4 mins.).

Disable

To switch off the timeout facility, check ☒ the box.

“Data Mapping” button – Modbus BIM

Click this button to see details of how the I/O data is configured for packed data mapping. For full details of how packed mapping works see the INM8505 – Modbus BIM Instruction Manual.

Figure 47 - Modbus Packed Mapping box

Slot No.	Module No.	Input		Echo		Output	
		Start Addr	End Addr	Start Addr	End Addr	Start Addr	End Addr
1	8110-DI-DC	6340	6340	0	0	0	0
2	8115-DO-DC	0	0	6349	6349	8194	8194
3	8101-HI-TX	6341	6348	0	0	0	0
4	8104-AO-IP	0	0	6350	6357	8195	8202
5	--	0	0	0	0	0	0
6	--	0	0	0	0	0	0
7	--	0	0	0	0	0	0
8	--	0	0	0	0	0	0

* All numbers displayed in the above list are decimal values

Generate CSV File Close

Note: This shows only the first eight module positions while the actual display always shows all 32 modules.

To save these details, click the **Generate CSV File** button and save the file in a .csv format to a chosen location.

“Data Mapping” button – Profibus BIM

Click this button to see the **Profibus address mapping** dialog box which displays the input (IW) and output (QW) bytes and offsets for the modules listed in the navigation tree.

Figure 48 - Profibus address mapping

This report gives details of the data and associated offsets within the Profibus telegrams. It also recommends how the gsd logical modules (e.g. 16 words in) should be chosen when configuring the slave within the Host Profibus configuration software. Some hosts (e.g. Siemens S7-300) have limitations in the size of data that can be moved in a consistent block. Please select the relevant entry for your host in words.

16

Module	Tag	Slot	Channel	IW bytes	QW bytes	IW offset	QW offset	Telegram	Words
BIM	Status	-	-	2	-	0	-	IW	28
BIM	Control	-	-	-	2	-	0	IW used	28
8101-HI-TX		1	1	2	-	2	-	IW telegram	16
8101-HI-TX		1	2	2	-	4	-		4
8101-HI-TX		1	3	2	-	6	-		8
8101-HI-TX		1	4	2	-	8	-	QW	16
8101-HI-TX		1	5	2	-	10	-	QW used	16
8101-HI-TX		1	6	2	-	12	-	QW telegram	16
8101-HI-TX		1	7	2	-	14	-		
8101-HI-TX		1	8	2	-	16	-		
8102-HO-IP		2	1	-	2	-	2		
8102-HO-IP		2	2	-	2	-	4		
8102-HO-IP		2	3	-	2	-	6		
8102-HO-IP		2	4	-	2	-	8		
8102-HO-IP		2	5	-	2	-	10		
8102-HO-IP		2	6	-	2	-	12		

Generate CSV File OK

To save these details, click the **Generate CSV File** button and save the file in a .csv format to a chosen location.

BIM Dynamic Data tab

This tab displays various dynamic BIM parameters. It is split into two sections BIM Status and BIM Error Details. The BIM Status display shows the current settings in the Overall BIM Status register. The BIM must be on line in order to display the BIM status information.

BIM Status**Figure 49 - BIM Status**

BIM Status	
Parameter	Status
BIM in Failsafe State	No
BIM Restarted	No
2/2 Power supply failed	No
NSM Present	No
Configuration saved in NVM	Yes
Mapping Changed	No
Communications on LAN A	Yes
Communications on LAN B	Yes
Configurator and LAN B Locked out	No
LAN A Lockout	No
Scanning Modules	Yes
BIM Scanning Overload	No
BIM Event Log Overflow	No
2/1 IS Power Supply Failed	No
Diagnostic Change	No
Config Port connected	Yes

The above image shows details of a Modbus BIM. The Profibus display is a little different. For more information about these parameters see the Instruction Manual for the BIM.
(INM8502 – for Profibus BIM, INM8505 – for Modbus BIM)

BIM Error Details**Figure 50 - BIM Error Details**

BIM Error Details	
Pass-through Bitmap	<input type="text" value="0"/>
Scan Overload Bitmap	<input type="text" value="0"/>

Passthrough Bitmap

When HART data passes through a module this bitmap will display a hexadecimal word that identifies the module(s) involved.

Scan Overload Bitmap

If a scan overload occurs then this field will display a hexadecimal word that identifies the module(s) involved.

Module Details tab

This tab displays the basic, but individual, details of up to 32 modules connected to the selected BIM.

Figure 51 - Module details

Slot No.	Module No.	Module Type	No. of Chan.	Primary Scan Rate(mSec)	Modified	Module State
1	8110-DI-DC	DI, 24V DC Module powered, 8-Ch, 2/2	8	40	No	Running
2	8115-DO-DC	DO, 2-60V DC Module Powered, 8-Ch, 2/2	8	250	No	Running
3	8101-HI-TX	AI with HART, 4-20mA, 8-Ch, 2/2	8	100	No	Running
4	8104-AO-IP	AO, 4-20mA, 8-Ch, 2/2	8	250	No	Running

Parameter	Meaning
Slot No.	The number of the system slot occupied by a module (1 – 32).
Module No.	The module's part number.
Module Type	A shorthand description of the type of module.
No. of Chan.	The number of channels available in the module.
Primary Scan Rate	The primary scan rate in milliseconds.
Modified	Whether the module's parameters have been changed from the uploaded values.
Module States	The current status of the modules (BIM must be on-line, else NA) See Module Status in appropriate BIM manual for list of states.

I/O module level

When a module is selected in the Navigation Tree the following five tabs appear in the Tab Bar.

Figure 52 - Module tabs



Module Properties tab

This tab displays the fundamental properties of the selected module and are not editable.

Figure 53 - Module properties

If the Configurator is not able to gather the information, i.e. the BIM and modules are not “on-line”, then the fields marked with an asterisk ‘*’ in the following table will display as zero.

Parameter	Meaning
<i>Module No.</i>	The module’s part number.
<i>Module Type</i>	A shorthand description of the type of module.
<i>No. of Channels</i>	The number of channels available in the module.
<i>Software Version*</i>	The release version of the software.
<i>Hardware Version*</i>	The release version of the hardware.
<i>Module Serial Number*</i>	The module’s serial number.
<i>Passthrough Supported</i>	Whether the module can recognise or use messages from the host that have “passed through” the BIM.

Module Attributes tab

This tab enables the user to view and/or edit the system attributes of the selected module.

Figure 54 - Module details

Module No.

This displays the part number of the module. It is non-editable.

Slot Number

This non-editable field shows which of the BIM's 32 module slots it occupies.

Failsafe Timeout

This field defines the amount of time the module will wait, on loss of BIM communications, before going in to failsafe. Values between 0 and 25.5 seconds are permitted.

Figure 55 - Scan rates

Scan rates do not define the rate at which a module has its data recovered. The module's data is read at the fastest rate possible.

However, the user defined scan rate does serve two useful purposes. First, it defines a worst-case period between data reads. If this rate is not achieved then a scan overload flag is set. Secondly, it gives the BIM the means to prioritise data collection. For example, a module with a scan rate of 40 ms will tend to be read twice as often as a module with an 80 ms scan rate.

A module has a maximum scan rate, which can also be regarded as its *minimum period*. There is no point in trying to scan it faster than this, as the module has a minimum period that it requires to update its field data.

The minimum periods are approximately 6 ms for discrete modules and 20 ms for analog ones.

The module will, therefore, have its data read sometime between the minimum period and the value set by the user in the scan rate box(es) in this tab. The BIM constantly calculates this information to avoid reading data too early or too late. The user is advised to keep to the default values provided for the modules unless there is a valid reason to amend them.

Primary

The "worst case" data update period for the module's primary field variables. Values from 0 to 65,535 ms are permitted but, initially, the user is advised to use the default value provided.

Secondary (if applicable)

The "worst case" data update period for the module's secondary variables – such as HART values or input pulse counter readings. Values from 0 to 65,535 ms are permitted but, initially, the user is advised to use the default value provided.

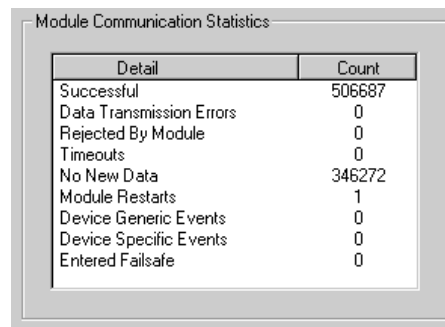
Figure 56 - Attributes modified?
Attributes Modified

The Configurator displays data that it has uploaded from the BIM but also retains a reference copy. If the user modifies any of the displayed parameters then the Configurator recognises this and changes this indicator from No to Yes.

Module Dynamic Data tab

The Module Dynamic Data tab displays statistics and diagnostic data regarding the performance of the module. This will be of more interest to the support engineer, who will be looking for detailed information on the status and performance of the module, than it will be to the process engineer.

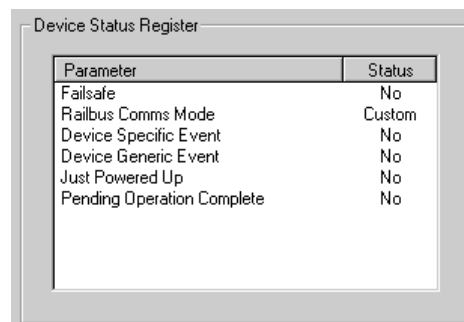
This data is refreshed every 10 seconds (approximately) when in Auto Mode, or when the Refresh button is clicked if in Manual Mode.

Module Communication Statistics**Figure 57 - Module Communication Statistics**


Detail	Count
Successful	506687
Data Transmission Errors	0
Rejected By Module	0
Timeouts	0
No New Data	346272
Module Restarts	1
Device Generic Events	0
Device Specific Events	0
Entered Failsafe	0

This shows the individual Module Communication Statistics and displays the number of named events that have occurred.

Detail	Meaning
Successful	The number of successful messages received.
Data Transmission Errors	The number of data transmission errors that have occurred.
Rejected by Module	The number of bad messages that the module has rejected
Timeouts	The number of timeouts that have occurred.
No New Data	The number times “No New Data” has been signalled.
Module Restarts	The number of times the module has been restarted.
Device Generic Events	The number of device generic events that have occurred.
Device Specific Events	The number of device specific events that have occurred.
Entered Failsafe	The number of times the module has entered failsafe.

Device Status Register**Figure 58 - Device Status Register**


Parameter	Status
Failsafe	No
Railbus Comms Mode	Custom
Device Specific Event	No
Device Generic Event	No
Just Powered Up	No
Pending Operation Complete	No

This shows the status of the individual Device Status Register bits. Generally, a **Yes** status indicates that the indicated event has occurred and the register bit has been set. A **No** status shows that the bit is in its normal (reset) state. Like the Diagnostic Status and the Railbus Status Registers most of these bits are of no interest to the average user and will be of significance only in diagnostic applications to a service engineer. The only one of general interest is the **Failsafe** parameter which will indicate whether the module is in its failsafe state.

Railbus Status Register**Figure 59 - Railbus Status Register**

Railbus Status Register	
Parameter	Status
Rail timeout exceeded	No
Control Ready de-asserted too long	No
Railbus address asserted too long	No
Railbus message was aborted	No
Excessive Railbus communication	No

This shows the status of the individual Railbus Status Register bits. A **Yes** status indicates that the indicated event has occurred and the register bit has been set. A **No** status shows that the bit is in its normal (reset) state. Like the Device Status and the Diagnostic Status Registers, most of these bits are of no interest to the average user and will be of significance only in diagnostic applications to a service engineer.

Diagnostic Status Register**Figure 60 - Diagnostic Status Register**

Diagnostics Status Register	
Parameter	Status
Diagnostics Status Register CRC Error	No
Memory CRC Error	No
Internal Watchdog	No
Memory unformatted	No

This shows the status of the individual Diagnostic Status Register bits. A **Yes** status indicates that the indicated event has occurred and the register bit has been set. A **No** status shows that the bit is in its normal (reset) state. Like the Device Status and the Railbus Status Registers, most of these bits are of no interest to the average user and will be of significance only in diagnostic applications to a service engineer.

Module State

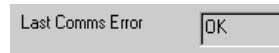
This field indicates the current state of the module. The states that might be encountered are shown in the table below.

Figure 61 - Module State

Module State	Running
--------------	---------

State	Description
EMPTY	The slot is empty, it has no configuration and a module is not detected.
UNTRAINED	Set during the first pass of the training procedure just after the module has been powered up.
TRAINED	Set during the second pass of the training procedure just after the module has been powered up.
NO CONFIGURATION	Set after training procedure if a valid configuration is not present.
VENDOR ID MISMATCH	Vendor ID of module differs from value provided during configuration.
DEVICE ID MISMATCH	Device ID of module differs from value provided during configuration.
RUNNING	Everything OK. The module is initialised and working.
FAILED	Module is not communicating.

Note: If the LSB contains (07) i.e. FAILED, then the MSB will contain a diagnostic value, otherwise the MSB will be 0x00.

Figure 62 - Last Comms Error***Last Comms Error***

This field indicates the current state of the module. This information is for factory use only. Consult the BIM manual for some further details.

Figure 63 – Clear Counters button***Clear Counters button***

Click on this button to zero the counts in the **Module Communication Statistics** registers. The effect can be seen in the display (top left of this tab display). The action of clicking on this button also initialises the **Actual Scan Rate** field (see below). Note, this button is not provided when the Configurator is in “Offline” mode.

Figure 64 - Actual Scan Rate***Actual Scan Rate***

This displays the average rate at which the selected module has been scanned since the last refresh of the Configurator data. The field is normally greyed-out until the **Clear Counters** button is clicked (see above). Note, this field is not provided when the Configurator is in “Offline” mode.

Channel Attributes tab

The Channel Attributes tab enables the user to edit the channel variables. For example; channels can be allocated a tag name, or they can be made active or inactive via this tab. Alarm thresholds can be defined here and individual states, or values can be set for channels that are forced into a failsafe condition by a comms. failure.

To simplify editing, many of the attributes can be modified with a simple check box, a drop-down list or increase/decrease buttons. Occasionally, as in tag names, the full entry will require a small degree of typing but generally the operations can be performed with just a mouse.

The range of options vary with the module type:

- Discrete input modules
- Discrete output modules
- Analog input modules
- Temperature input modules
- Analog output modules
- Pulse input modules

Discrete input modules

For each channel, the following attributes can be edited.

Channel tag name

A name for the channel or its function can be entered here. Up to 22 ASCII text characters can be entered in this field.

Active

This is a toggle control that makes the channel active or inactive. Check the box ☒ to activate the channel, or uncheck it ☐ to make it inactive.

Polarity (2/1 modules only)

This field determines whether the Latch function latches to a high state or a low state. See Latch.

Latch

If this function is enabled then, if the input goes from low to high, it will stay at that level. Select from Enabled (latch facility ON) or Disabled (no latch facility) using the drop-down box.

Note: 2/1 modules also have the option of choosing a high or a low latch state using the **Polarity** field.

LFD (2/1 modules only)

This allows the Line Fault Detect facility to be switched **On** or **Off**. When switched On, the module will detect a channel that has an open circuit or short circuit fault on the device loop and set a flag to inform the BIM.

Failstate Value

This field determines the value the BIM will display to the host if the module fails or goes into failsafe mode. The choices are **On** (high), **Off** (low) or **Hold Last Value**, which maintains the input at the last valid input value.

Counter Enable

Check this box ☒ to switch the input counter on or uncheck it ☐ to switch it off.

Filter

This defines the delay parameter for the input de-bounce filter. Three options are available:

- **None** – No delay
- **Fast** – 22 ms settling time before accepting the input value.
- **Slow** – 258 ms settling time before accepting the input value.

Discrete output modules

For each channel, the following attributes can be edited.

Channel tag name

A name for the channel or its function can be entered here. Up to 22 ASCII text characters can be entered in this field.

Active

This is a toggle control that makes the channel active or inactive. Check the box ☒ to activate the channel, or uncheck it ☐ to make it inactive.

Failsafe Value

This field determines the value the output will adopt if the module fails or goes into failsafe mode. The choices are **On** (high), **Off** (low) or **Hold Last Value**, which maintains the output at the last value it was given by the host.

Operation mode

This field defines the type of output from the DO module.

- Discrete
- Single Pulse – Static
- Continuous Pulse – Static
- Continuous Pulse – Dynamic (**8215-DO-IS only**)

From the above it can be seen that three basic types are available, discrete, single pulse and continuous pulse. Discrete means that the BIM signals an On or Off condition on demand. Single Pulse mode has a “single shot - On” action with a duration set by the **On Time** field. Continuous Pulse provides a continuous stream of pulses defined by an **On Time** and a **Period**.

The Static and Dynamic options for the Continuous pulse modes define the behaviour of an output when entering or leaving the failsafe or inactive states.

Static mode

When the module enters failsafe, or is made inactive, then *pulse mode is disabled*, the channel is configured as a latched output and is driven to its failsafe value. The module must then be re-initialised by the BIM before it can be restored to an operational condition.

Dynamic mode

If the module enters failsafe, the output is driven to its failsafe value. If it is made inactive, the output is turned Off (i.e. de-energised). On leaving the failsafe or inactive state, the channel will resume operation with the previous configuration and output.

LFD (2/1 modules only)

This allows the Line Fault Detect facility to be switched **On** or **Off**. When switched On, the module will detect a channel that has an open circuit or short circuit fault on the device loop and set a flag to inform the BIM.

Period

This defines the time between the leading edges of the pulses for the continuous pulse mode. It can not be less than the On Time (see next) and any attempt to do so creates a warning from the software. The period can be set *in 2 ms intervals* anywhere between 4 ms and 130,000 ms.

On Time

This defines the duration of the On pulse from 2 ms upwards. The On Time must always be set to at least 2 ms less than the Period; a warning will be displayed if the user tries to set a value that violates this. For AC modules, see also the following note.

Note: AC discrete output modules can be triggered On or Off only during a zero crossing of the AC waveform. The minimum On time of a pulse is therefore limited to half the total period of the AC waveform used.

Analog input modules**Channel tag name**

A name for the channel or its function can be entered here. Up to 22 ASCII text characters can be entered in this field.

Active

This is a toggle control that makes the channel active or inactive. Check the box ☒ to activate the channel, or uncheck it ☐ to make it inactive.

Sensor Type (8230-AI-IS only)

Choose “Volts” or “Potentiometer” from the drop down list

HAlarm, LAlarm (HAlarm and LAlarm)

These fields enable the user to set threshold values for the alarms (**H**igh and **L**ow). Some modules have additional alarms (High-High and Low-Low) set at more extreme limits. All of these can be changed by typing a new value, or by using the up and down adjustment arrows on the right-hand edge of the field.

With the exception of the 8230-AI-IS module, the minimum and maximum values are -25% and 131.25%, respectively. Attempts to exceed these, or to give a low alarm a value greater than a high alarm, will produce a warning from the software.

The 8230-AI-IS has potentiometer and voltage input options and the high and low alarm ranges for these are:

- Potentiometer - 0% and 100%
- Voltage input - 0 to 12.5 V

Alarm Deadband

This defines a “dead”, or hysteresis, band which prevents the alarm from cycling on and off when a rapidly varying (i.e. noisy) signal crosses the alarm threshold. The value should be set large enough to prevent local noise levels from causing this problem. This value applies to all four alarms.

With the exception of the 8230-AI-IS module, the minimum and maximum values are 0 % and 156.25 %, respectively. The 8230-AI-IS has potentiometer and voltage input options and the minimum and maximum values are 0% and 100%.

Deadzone

If the input signal measured by the module changes from its last reading, the “New Data” flag will be set. If however, the change is not significant to the control process, then this event will cause un-necessary data traffic to the BIM and the host. The **Deadzone** parameter is used to set a *minimum signal-change value*. If the input signal change is less than this value, it will not be signalled to the BIM.

With the exception of the 8230-AI-IS module, the setting range can be any where between 0 and 156.25% of the analog range. A zero value will cause *every change* to be signalled to the host, while a high value will de-sensitise the system. The setting should be made with regard to optimum control without excessive LAN traffic.

The 8230-AI-IS module has a deadzone range of 0% and 100% for volt or potentiometer input.

Filter time

This defines the bandwidth of a low pass input filter. Filter times between 50 milliseconds and 60 seconds are available.

A low value, like 50 milliseconds, will make the system sensitive to the smallest changes in input, while the 60 second value will smooth out minor changes. To switch off the filtering completely, choose a '0' value, which is also the default.

Open Circuit (8230-AI-IS only)

Use this field to define the value that gets reported to the BIM if the sensor goes open-circuit. Select from: **Upscale**, **Downscale** or **None**.

Compensation (8230-AI-IS only)

When "Potentiometer" is selected in the **Sensor Type** field this field becomes active and is used to compensate for lead resistance. The value entered should be expressed as a percentage of the potentiometer's total resistance value.

Failstate Condition

This provides a choice of states that the BIM can report to the host in the event that the module fails or goes into failsafe mode. The drop-down list box offers four options:

Option	Effect
Hold Last Value	Report to the host the same input value that occurred immediately before the failure or the adoption of a failsafe state.
Failstate Value	Report to the host the value set in the Failstate Value field.
High	Report to the host the highest possible value.
Low	Report to the host the lowest possible value.

Failstate Value

When the **Failstate Condition** (see above) has been set to **Failstate Value**, this field defines the value the input will adopt. With the exception of the 8230-AI-IS module, the value can be set as a percentage between 0 to 131.25 %, of the analog input range.

The 8230-AI-IS has potentiometer and voltage input options and the failstate value ranges for these are:

- Potentiometer - 0% and 100%
- Voltage input - 0 to 12.5 V

HART Comms (HART modules only)

The pass-through of HART communications for the module can be **Enabled** or **Disabled** with this field.

Profibus HART enable (Profibus HART modules only)

Check any of the four boxes to select the HART variables required from the channel. Any checked box enables the **HART Comms** field for that channel.

Note: Be aware that each selected variable adds 2 words (32 bits) to the Profibus telegram.

Temperature input modules

Channel tag name

A name for the channel or its function can be entered here. Up to 22 ASCII text characters can be entered in this field.

Active

This is a toggle control that makes the channel active or inactive. Check the box ☒ to activate the channel, or uncheck it ☐ to make it inactive.

Sensor type

Use the drop-down box in this field to define the sensor type. The temperature range depends upon the one selected.

Wires

This applies to RTD modules (8x06) only. Use it to choose the number of wires – 2, 3 or 4 – for the RTD sensor.

HAlarm and LAlarm

These fields enable the user to set threshold values for the upper alarm (High) and the lower alarm (Low). Change the value by entering a new one – in mV or °C - or by using the up and down adjustment arrows on the right-hand edge of the field.

The maximum and minimum values depend upon the range of the sensor being used (see Sensors above) and will therefore need to be modified if the sensor is changed. Attempts to exceed these, or to give one of the low alarms a value that exceeds one of the high alarms will produce a warning from the software.

Deadzone

If the input signal measured by the module varies from its last reading then this will cause the “New Data” flag to be set. If the change is insignificant to the control process, then the event causes un-necessary data traffic to the BIM and the host. This field is used to set a *minimum signal-change value*. If the input signal change is less than this **Deadzone** value, it will not be signalled to the BIM.

The setting range can be anywhere between 0 and 100%.

Filter

The filter is used to reduce minor fluctuations in the input values. The options are:

- **Disabled**
- **Average of Two Readings**
- **Running Average**

The Two Reading Average is derived from the current reading and the previous reading. The Running Average uses the current reading and the last *filter* output.

Open Circuit

Use this field to define the value that gets reported to the BIM if the sensor goes open-circuit. Select from: **Upscale**, **Downscale** or **None**.

Compensation

For thermocouple and mV modules, the options to use the internal or remote CJs are **On** or **Off**.

When using RTD or ohmic inputs, the resistance of the compensation wires can be entered in the field.

Failstate Condition

This provides a choice of states that the channel input value can adopt in the event that the module goes into failsafe mode. The drop-down list box offers four options: Hold Last Value, Failstate Value, High and Low. The **Failstate Value** can be set with the next field.

Failstate Value

When the **Failstate Condition** (see above) has been set to **Failstate Value**, this field defines the value the input will adopt. The value can be anywhere from 0 to 100 % of the analog input range.

Analog output modules

Channel tag name

A name for the channel or its function can be entered here. Up to 22 ASCII text characters can be entered in this field.

Active

This is a toggle control that makes the channel active or inactive. Check the box ☒ to activate the channel, or uncheck it ☐ to make it inactive.

Failsafe Condition

This defines the output state in the event of the module going into failsafe mode. There is a choice of **Hold Last Value** or **Failstate Value**. The **Failstate Value** can be set with the next field.

Failsafe Value

When the **Failstate Condition** (see above) has been set to **Failstate Value**, this field defines the value the output will adopt. The value can be anywhere from 0 to 100 % of the analog output range.

Initial Output Value

This is a specific and definable value that is written to the output when the module state changes from inactive to active or when the module is first initialised. The range is 0 to 100%.

HART Comms (HART modules only)

The pass-through of HART communications for the module can be **Enabled** or **Disabled** with this field.

Note: The passthrough is not fully enabled until a value is set for the **Secondary Scan Rate** in the **Module Attributes** tab – a warning is provided on screen if the value has not been set.

HART Slot0/1/2/3 (HART modules only)

Check the box ☒ to activate the HART variable, or uncheck it ☐ to make it inactive.

Slot0/1/2/3 Code (HART modules only)

Enter the required HART code for the specific variable.

Profibus HART enable (Profibus HART modules only)

Check any of the four boxes to select the HART variables required from the channel. Any checked box enables the **HART Comms** field for that channel.

Pulse input modules

Channel tag name

A name for the channel or its function can be entered here. Up to 22 ASCII text characters can be entered in this field.

Active

This is a toggle control that makes the channel active or inactive. Check the box ☒ to activate the channel, or uncheck it ☐ to make it inactive.

H Alarm and L Alarm

These fields enable the user to set threshold values, in Hz, for an upper alarm (High) and a lower alarm (Low). These can be changed by typing a new value, or by using the up and down adjustment arrows on the right-hand edge of the field.

The maximum and minimum values are 100,000 Hz and 0 Hz.

Acceleration Alarm

Choose from the drop down list to disable or enable an alarm for acceleration or deceleration.

Cycle/sec2

Set an integer alarm value between 1 and 100,000. For negative acceleration values, use positive value and change **Acceleration Alarm** to Deceleration.

Failstate Value

This field defines the value the input will adopt in the event of the module entering the failsafe mode. The maximum value is 100000 Hz.

Alarm Deadband

This defines a “dead”, or hysteresis, band which prevents the alarm from cycling on and off when a rapidly varying (i.e. noisy) signal crosses the alarm threshold. The value should be set large enough to prevent local noise levels from causing this problem.

The maximum and minimum values are 100 kHz and 0 Hz, respectively.

Filter

The filter sets an upper limit to the input pulse bandwidth. Choose from the drop-down list which offers: 100, 20, 5 and 1 kHz.

Frequency Range

This defines the input resolution of the module. The available settings are 5, 10, 30, 50 and 100 kHz bandwidth. Use the drop-down box to select the range required. The maximum bandwidth of 100 kHz is the default value.

Sample Rate

This is related to frequency, as the pulse rate is calculated by measuring the time between pulses. The frequency is measured from one edge to the next occurrence of the same edge on the next pulse.

The frequency value is averaged over the most recent measurements. The number of measurements is configured using the Sample Rate parameter. The available options range from 20 ms to 200,000 ms.

OC Response

Each channel can be configured to detect an open or short circuit condition in the field wiring. This fault is signalled by setting the Open Circuit or Short Circuit bit in the Alarm Status byte.

This field defines whether the frequency value should be set to the top of the range (**plus full-scale**) or the bottom of the range (**minus full-scale**) on detection of either fault condition. **Off** disables these responses.

Missing Pulse Multiplier

If no input pulse is detected for a time period, then a Missing Pulse Alarm is signalled. The value chosen for this parameter is multiplied by the Sample Rate to arrive at a timeout figure. The maximum multiplier value that can be used is 255. Setting the figure to 0 disables the missing pulse alarm.

Counter Preset Value

This field is used to set a count value. In the case of an upward count the counter will count up to this value. In the case of a downward count it will be the value from which the count starts. The maximum value for this preset is 2,147,483,647 (32-bit signed integer).

Counter Direction

This field defines whether the counter should increment (Up) or decrement (Down).

Quadrature Enabled

When checked, this will combine the two input channels into a quadrature pair that are capable of sensing the direction of rotation.

Polarity

This defines whether the pulse rate is measured from the rising or falling edge of the pulse.

DI Enabled

This field is used to enable, or disable, the Discrete Input facility on Channel 1. There is no DI input on Channel 2.

Counter Enabled

When this is enabled, the input counter will increment for each pulse registered. When disabled, the input counter will stop incrementing and retain its last value.

Channel 1

These fields define the input parameters for Channel 1 and the function type for the DO.

Sensor

Select from the following input sensors: NAMUR1, Voltage input, Current input, Switch input or Hall.

Threshold

This applies only to the Voltage and Current input sensor types. The threshold value for the sensor can be set from the dropdown list.

DO function

This field is used to define the DO output. The options are: Disabled, High/Low Alarm, Acceleration Alarm, Preset Counter Value Reached, Quadrature and Scaled Pulse Retransmission.

Retransmission Scale Factor

This defines the division factor for the Scaled Pulse Retransmission. Choose values from 1 to 256.

Channel 2

These fields define the input parameters for Channel 2 and the function type for the DO. It does not have the DO facilities of Quadrature and Scaled Pulse Retransmission that are found for Channel 1.

Sensor

Select from the following input sensors: NAMUR1, Voltage input, Current input, Switch input or Hall.

Threshold

This applies only to the Voltage and Current input sensor types. The threshold value for the sensor can be set from the dropdown list.

DO function

This field is used to define the DO output. The options are: Disabled, High/Low Alarm, Acceleration Alarm and Preset Counter Value Reached.

Channel Dynamic Data tab

The Channel Dynamic Data tab displays the current state of the module variables for each channel.

The channels are numbered, have a user defined **Tag Name** and an indication of whether the channel is currently **Active**. After that, the variables displayed depend on the module selected.

Discrete Input modules

Module types:

- 8107-DI-DC
- 8108-DI-DC
- 8109-DI-DC
- 8110-DI-DC
- 8121-DI-DC
- 8122-DI-DC
- 8111-DI-AC
- 8112-DI-AC
- 8113-DI-AC
- 8114-DI-AC
- 8220-DI-IS*

*8-channel or 16-channel depending on field terminal used

In addition to **Tag Name** and **Active**, the following channel fields are presented.**Value**This field displays whether the channel is **On** (high) or **Off** (low).**Counter**

This displays the contents of the input counter.

LFD (2/I modules only, i.e. 82xx)

Line Fault Detect. This indicates whether the channel has detected a line fault.

Forced?

This indicates whether the input has been forced to its current value.

Note: Forcing is a commissioning tool that enables the engineer to force a channel to a specific state and then check that the channel complies.**Discrete Output modules**

Module types:

- 8115-DO-DC
- 8117-DO-DC
- 8215-DO-IS
- 8116-DO-AC
- 8118-DO-AC

In addition to **Tag Name** and **Active**, the following channel fields are presented.**Output value**This displays the value currently being output. **On** (high) or **Off** (low).**Readback value**

This displays the output value that the module is reporting back to the BIM.

On (high) or **Off** (low).**LFD**

Line Fault Detect. This indicates whether the channel has detected a line fault.

Forced?

This indicates whether the channel has been forced to its current value.

Note: Forcing is a commissioning tool that enables the engineer to force a channel to a specific state and then check that the channel complies.**Analog Input modules**

Module types:

- 8101-HI-TX
- 8103-AI-TX
- 8230-AI-IS
- 8201-HI-IS
- 8119-VI-05

In addition to **Tag Name** and **Active**, the following channel fields are presented.**Value (mA)**

This displays the analog input value (mA or V) that the input is currently registering.

Alarms – High-High, High, Low, Low-Low

Each of the alarm fields will indicate whether the input has crossed their individual thresholds.

Yes (alarm condition) or **No** (no alarm).

A/d Error

Displays whether an Analog to Digital converter error has been detected.

Note: If this is indicated, the module should be returned to MTL.

Forced?

This indicates whether the channel has been forced to its current value.

Note: Forcing is a commissioning tool that enables the engineer to force a channel to a specific state and then check that the channel complies.

If the analog input module has HART capabilities then, in addition to the basic analog input fields, the following channel fields will be displayed to show the current state of the HART variables.

HART Comms Error (HART modules only)

This field indicates the occurrence errors in the HART communications. **Yes** (errors have occurred) or **No** (no errors).

HART No Comms (HART modules only)

This field indicates that the HART communications have failed. **Yes** (failure) or **No** (OK).

HART Status Change (HART modules only)

This field indicates whether a change has occurred in the HART status - **Yes** or **No**.

HART Device Status (HART modules only)

This displays the **second** byte of the HART status word - also called the *response code* - which contains the operational state of the field or slave device. The hex byte that is displayed may be a combination of some of the following bits.

Bit #	Name
7	Field device malfunction
6	Configuration changed
5	Cold start
4	More status available
3	Analog output current fixed
2	Analog output saturated
1	Non-primary variable out of limits
0	Primary variable out of limits

HART Response (HART modules only)

This displays the **first** byte of the HART status word - also called the *response code* - which may contain a response to a host command. Bit 7 of this byte will be 0 to indicate that it is a command response and not a communications error. The other six bits (0 – 6) will be decoded as a hex number and displayed in this field. Some of the hex values are tabulated here but others will require interpretation from more comprehensive HART literature.

Value	Description
0	No command-specific error
1	(Undefined)
2	Invalid selection
3	Passed parameter too large
4	Passed parameter too small
5	Too few data bytes received
6	Device-specific command error
7	In write-protect mode
10	Access restricted
20	Device is busy
40	Command not implemented

HART Prim, Sec, Tert and 4th Var (HART modules only)

These fields display the primary, secondary, tertiary and fourth HART variables. When the value is numerical it is displayed. If the returned information is **not a number**, then NAN is displayed.

Temperature Input modules

Module types:

- 8105-TI-TC
- 8106-TI-RT
- 8205-TI-IS
- 8206-TI-IS

In addition to **Tag Name** and **Active**, the following fields are presented.

Value

Displays the current input value in:

- mV for thermocouple type - TC
- Ω for RTD type - RT or
- degrees Celsius – either type.

H Alarm and L Alarm

These alarm fields will indicate whether the input has crossed their individual thresholds. **Yes** (alarm condition) or **No** (no alarm).

Open Sensor

Indicates whether the sensor for the channel has an open circuit fault.

A/d error (8205/6 only)

Displays whether an Analog to Digital converter error has been detected.

Note: If this is indicated, the module should be returned to MTL.

CJC error (8205/6 only)

Indicates that either of the (two) cold junction compensation (CJC) elements in the field terminal has gone open circuit or out of range.

Forced?

This indicates whether the channel has been forced to its current value.

Note: Forcing is a commissioning tool that enables the engineer to force a channel to a specific state and then check that the channel complies.

Analog Output modules

Module types:

- 8102-HO-IP
- 8104-AO-IP
- 8202-HO-IS
- 8204-AO-IS

Output value (mA)

This displays the value of the current (mA) being output.

Readback value (mA)

This displays the value of the current (mA) being reported back to the BIM.

Output Open

This indicates whether the channel output's field wiring is open circuit.

HART Response (HART modules only)

This displays the **first** byte of the HART status word - also called the *response code* - which may contain a response to a host command. Bit 7 of this byte will be 0 to indicate that it is a command response and not a communications error. The other six bits (0 – 6) will be decoded as a hex number and displayed in this field. For details of the responses see the *Analog input* module section.

Forced?

This indicates whether the channel has been forced to its current value.

Note: Forcing is a commissioning tool that enables the engineer to force a channel to a specific state and then check that the channel complies.

If the analog output module has HART capabilities then, in addition to the basic analog output fields, the following channel fields will be displayed to show the current state of the HART variables.

HART Comms Error (HART modules only)

This field indicates the occurrence errors in the HART communications. **Yes** (errors have occurred) or **No** (no errors).

HART No Comms (HART modules only)

This field indicates that the HART communications have failed. **Yes** (failure) or **No** (OK).

HART Device Status (HART modules only)

This displays the **second** byte of the HART status word - also called the *response code* - which contains the operational state of the field or slave device. To interpret the status message, see the Analog *input* module section.

HART Status Change (HART modules only)

This field indicates whether a change has occurred in the HART status - **Yes** or **No**.

Diags. in process (HART modules only)

This indicates whether the device is undergoing device-specific diagnostics by a maintenance program connected to the system.

HART Prim, Sec, Tert and 4th Var (HART modules only)

These fields display the primary, secondary, tertiary and fourth HART variables. When the value is numerical it is displayed. If the returned information is not a number, then NAN is displayed.

HART Dev Var Slot0, Slot1, Slot2 and Slot3 (HART modules only)

Some field devices have an additional four HART variables. These fields display the HART codes for such variables.

Pulse Input modules

Module type:

- 8123-PI-QU
- 8223-PI-IS

Alarms – High, Low, Acceleration and Missing Pulse

Each of the alarm fields will indicate whether the input has crossed their individual thresholds. **Yes** (alarm condition) or **No** (no alarm).

LFD

Line Fault Detect. This indicates whether the channel has detected a line fault.

Open Circuit and Short Circuit

These indicate whether the channel's field wiring is open circuit or has a short circuit.

DI State

This shows the current state of the input – high (**1**) or low (**0**).

Frequency

This field displays the current input pulse frequency.

Acceleration

This field displays the current acceleration - based on the rate of change of input frequency.

Quadrature Forward and Reverse

These fields indicate whether the quadrature measurement is indicating a forward or reverse motion.

Preset Count Reached

This field displays whether the counter has reached the value set by the user.

Counter

This field displays the current value of the 31-bit counter. The counter also has a sign bit to recognise when a downward count has passed zero.

Tasks (How to...)

This section of the manual deals with a range of tasks that a user is likely to perform with the Configurator. It is broken down into the following categories:

- Security tasks
- Configuration tasks
- BIM tasks
- I/O module tasks

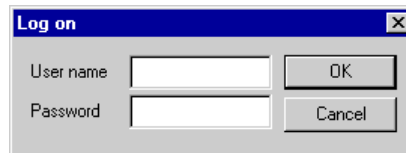
Select from these categories for the function required.

Security tasks

Log out one user and log in another

Click on **Tools | Security | Log on...** to display the **Log on** dialog box.

Figure 65 - Log on dialog



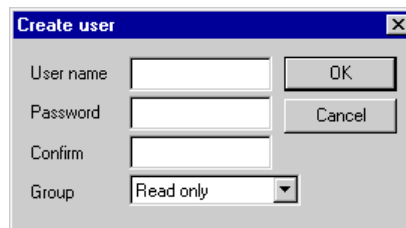
Enter the name of the user being logged on followed by their password.

The previous user is now logged out and the privileges of the new user become current.

Creating new users

Click on **Tools | Security | Create User...** to display the **Create User** dialog box.

Figure 66 - Create user dialog



Enter a name for the new user.

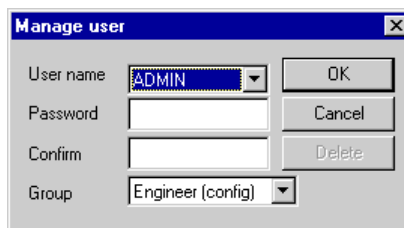
Enter a password for the user and type it again in the **Confirm** text box. The password and the confirmation will appear as a series of asterisks '*'. This is to ensure that an onlooker cannot read the password being typed. If the password entered in the confirm field is not the same as the one in the password field, a message box will inform the user of this fact and the names must be re-entered.

Click on the down arrow to the right of the drop-down list and choose a security **Group** – see page 16 for a description of group levels and associated privileges.

Removing a user

To delete a user from the access list. Click on **Tools | Security | Manage User ...** to display the **Manage user** dialog box.

Figure 67 - Manage user dialog



Select the **User name** to be removed from the drop down list. Click the **Delete** button to remove that user. Choose another name to delete, or click **OK** or **Cancel** button to close the dialog box.

Changing a user's group

A user's group, i.e. access level, may be changed at any time by a user who has the authority to do so.

Click on **Tools | Security | Manage User** to display the **Manage user** dialog box. See Figure 67 above.

First, choose the user who's access level needs to be changed. To do this, click on the down arrow to the right of the **User name** field. Choose the user from the drop-down list that appears.

Next, click on the down arrow to the right of the **Group** field and choose the access level required. Click **OK** to confirm the change.

Changing a password

Click on **Tools | Security | Change User** to display the **Change user** dialog box. See **Error! Reference source not found.** above.

First, choose the user who's password needs to be changed. To do this, click on the down arrow to the right of the **User name** field. Choose the user from the drop-down list that appears.

Type the new password in the **Password** field and the **Confirm** field. Click **OK** to confirm the change.

Configuration tasks

Creating a configuration file

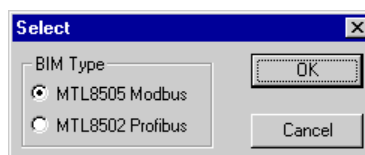
A configuration file can be created from a clean page, or from a file previously created for the earlier 8450 Configurator. To use a configuration file from the earlier 8450 Configurator see **Importing an 8450 Configuration File**.

To create a completely new file, either click on the **New** button on the Toolbar or use the **New** option on the **File** menu.

A dialog box appears offering a choice of two BIM types.

The configuration file is based upon the type of LAN that the system will use, i.e. Modbus or Profibus-DP and so the user must select the BIM that suits the LAN protocol.

Figure 68 - BIM selection dialog box



Click on the required BIM type then the OK button. This creates a new file with the chosen network protocol. To add nodes to the network, one or more BIMs need to be created. See **Creating a BIM** for details.

Importing a file created with the 8450 Configurator

The 8455 permits the importation of configuration files previously used with the earlier 8450 Configurator. Users of the 8450 Configurator can therefore re-use their original files.

(The user is referred to MTL Technical Service Note 101 for further information on the upgrade of Configurator firmware from V1.xx to V2.xx)

There are two types of file that can be imported:

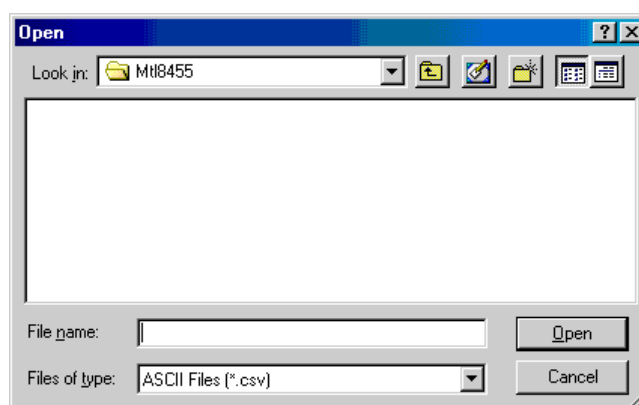
File type	Description
CSV files	These are configuration files that were created in a text editor or in a spreadsheet and saved in “comma separated value” format for the 8450 Configurator.
SSF files	This type of file was created by the earlier 8450 Configurator from a .csv file and could be downloaded direct to the BIM.

Importing the file

The user is advised to refer to MTL Technical Service Note before

Click the **Import Configuration** option on the **File** menu and an **Open** dialog box appears in order to select the file.

Figure 69 - Open dialog for importing earlier files



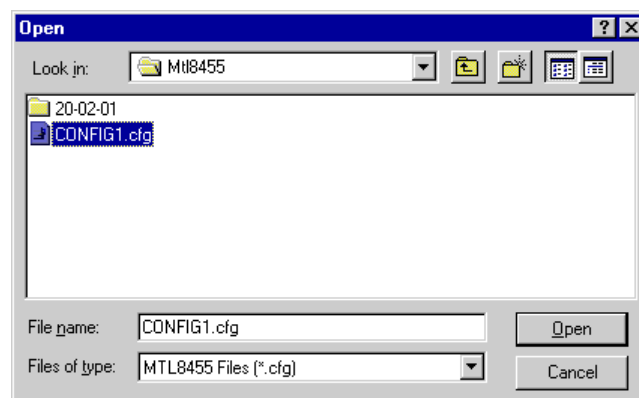
Use the **Files of type** drop-down list to select .csv or .ssf file format.

From the files listed in the dialog box, click on one to select it and then click **Open**.

Opening an existing configuration file

Click on the File Menu and select the **Open** option. The **Open** dialog box appears to permit selection of the location and file required.

Figure 70 - File Open dialog box



The default file location is the folder that contains the application files. The default configuration file type has a “.cfg” file extension as shown in the **Files of type** list box above. The offered alternative to this is “All files”.

- Choose the required file from the list of files shown and click the Open button.

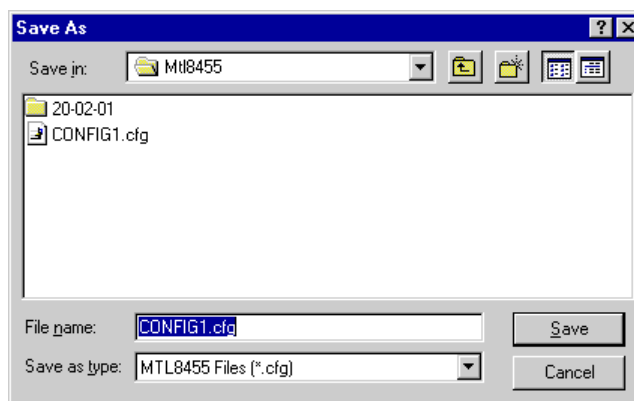
Note: If the file required has been opened recently it may be listed in the Recent Files section of the File menu. If so, click on the file name to open it.

Saving a configuration file

Click the **Save the current file** button on the Toolbar or use the Save option on the File Menu.

If the file has already has a name then the Configurator will instantly save it. If it does not yet have a file name, or the file was created with an earlier version of the 8455 Configurator, then the **Save As** dialog box appears.

Figure 71 - Save As dialog box



Use the **Save in** list box to find a suitable save location and enter a name for the file in the **File name** text box. It is not necessary to enter the file extension, i.e. .cfg, as this will be added to the file automatically. An existing file will be overwritten by the current one if a file name is chosen from the ones displayed. Click the **Save** button to finish.

Setting up the Configurator for a “local” BIM

If the BIM is not located in a hazardous area, or if it is a Profibus BIM being configured in a safe area, a PC running the Configurator can be connected directly to the configuration port on the BIM. See page 3 for the connection cable details.

- Connect the PC to the BIM via the cable and power-up the BIM/system.
- Start the Configurator and create, or open, a configuration file that has the same protocol as the BIM that is to be configured.
- Click on the Network icon in the Navigation Tree and then the File Attributes tab.
- In the Configuration Port Parameters section of this screen, set the **PC port** field to match the COM port used on the PC, then choose the **Local - Configurator Port** option for the **BIM Port** field.
- Click on the Auto Mode button on the Toolbar to establish communication with the BIM.

Setting up the Configurator for a “remote” Modbus BIM

If a Modbus BIM is in a remote location, a PC running the Configurator can be connected to the BIM via LAN B.

Configuring an existing system BIM

- Start the Configurator and create, or open, a configuration file that has the same protocol as the BIM that is to be configured.
- Click on the BIM icon in the Navigation Tree and then the Network Attributes tab.
- Choose **Remote Configuration** in the **LAN Mode** section of the screen.
- Click on the Network icon in the Navigation Tree and then the File Attributes tab.

- In the Configuration Port Parameters section of this screen, set the **PC port** field to match the COM port used on the PC, then choose the **Remote – LAN B** option for the **BIM Port** field.
- Click on the Auto Mode button on the Toolbar to establish communication with the BIM.

Configuring a new BIM

If the remote BIM is brand new and has not been configured previously:

- Start the Configurator and create, or open, a configuration file that has the same protocol as the BIM that is to be configured.
- Click on the BIM icon in the Navigation Tree and then the Network Attributes tab.
- Choose **Remote Configuration** in the **LAN Mode** section of the screen.
- Set LAN B address to 126 to match the default address of the new BIM
- Click on the Network icon in the Navigation Tree and then the File Attributes tab.
- In the Configuration Port Parameters section of this screen, set the **PC port** field to match the COM port used on the PC, then choose the **Remote – LAN B** option for the **BIM Port** field.
- Click on the Auto Mode button on the Toolbar to establish communication with the BIM.

Uploading BIM parameters

This action transfers a copy of the BIM's configuration parameters into the Configurator database.

In order to upload the parameters from a BIM:

- an operational communications link must be present between the BIM and the Configurator
- a new, or existing, configuration file must be open in the application window
- the configuration file must contain an icon for the BIM

Note: The BIM in the configuration file must be of the same type as the BIM whose parameters are to be uploaded. To check the type, see the **BIM Attributes** window.

To upload the configuration information from a BIM, either the BIM or one of the I/O modules attached to it must be selected in the Navigation Tree, then:

- Click the Upload icon on the Toolbar; or use the Upload BIM option on the Configuration menu; or right click on the BIM or one of its I/O modules and select Upload BIM
- A box appears on screen to indicate the progress of the upload. When this reads 100% completed, click the OK button to finish. The Configurator now contains a copy of the BIM's configuration data in its database.
- A message box appears on screen which shows the progress of the upload. When the upload box displays "Transmission completed", click the OK button on the box to finish the process.

Changing the Configurator mode

While it is connected to the Configurator, the BIM can continue to monitor the I/O modules and the LAN. The Mode options define when the Configurator will update its variables from the BIM.

The Configurator has three possible modes: Offline, Manual and Auto. The default mode is Offline. Choose one of the following modes as required.

Offline

When Offline the Configurator does not obtain any updated information from the BIM.

Manual

Manual mode allows the user to update the Configurator with BIM information on demand. To obtain an update use the Refresh option in the View menu.

Changes to parameter values in the configuration file will cause the background colour of the parameter to change to blue/cyan. This indicates a difference between the value held in the BIM and the current database value.

Auto

With the mode set to Auto, the Configurator obtains regular updates from the BIM. These occur approximately every 10 seconds.

Changes to parameter values in the configuration file will cause the background colour of the parameter to change to blue/cyan. This indicates a difference between the value held in the BIM and the current database value.

To change the mode, either:

- Click on the Offline, Manual or Auto button on the Toolbar or
- Right click on the Network icon (or a BIM icon) in the Navigation Tree, choose Mode from the options and then select Offline, Manual or Auto.

Setting LAN parameters

The baud rate and the parity settings are the only parameters that may be altered for the LAN port(s), the number of data bits and stop bits are fixed. With two LANs, both must be operated at the same speed and setting LAN A parameters will also define the LAN B parameters.

To modify the LAN parameters:

- Click on the Network icon and choose the File Attributes tab in the Tab Bar.
- In the LAN A Parameters section, choose the Baud and Parity settings from those available in the drop-down list boxes.

Note: With Modbus BIMs, do not exceed the baud rates recommended for the individual LAN modes. See the **LAN modes** information for more details.

Setting a BIM's LAN address

A BIM's address on a LAN must be unique. The Configurator will warn the user if the address is already in use for another BIM.

- Click on the icon for the BIM and then click the Network Attributes tab in the Tab Bar.
- In the LAN A Parameters section, use the up or down selection arrows on the Address box to select the required address.

Modbus BIMs

If LAN A and LAN B are completely separate then the BIM can use the same address for both of them but if the LANs are only different sections of the same LAN then the addresses must be different to make them unique.

Note: The LAN B address is not relevant if Single LAN mode is selected and becomes greyed out.

Setting configuration port parameters

The only setting required for the Configuration Port is to choose the PC serial COM port that will be used.

To modify the Configuration Port parameters:

- Click on the Network icon and choose the File Attributes tab in the Tab Bar.
- In the Configuration Port Parameters section choose, from the drop-down list box, the PC COM Port to be used.

Setting the LAN mode – Modbus only

This defines the status of the Modbus LAN(s); the redundancy, if any, and the use of the Configuration/HMS Port. Full details on how each mode operates and the recommended operating speed(s) can be found in the Instruction Manual for the Modbus BIM.

To set the Modbus LAN mode:

- Click on the BIM icon in the Navigation Tree and then the Network Attributes tab
- Choose the required mode from the options in the LAN Mode section (see page 22).

Downloading a new configuration to the BIM

This action will copy the configuration file from the Configurator database to the BIM. The configuration may also be saved to the BIM's non-volatile memory (NVM).

Think about the following points before downloading a configuration:

Do you have a copy of the current configuration in the BIM - so that it can be restored in the event of a problem with the new configuration? If not, save the new configuration to file (see page 45), then upload the current BIM configuration to the Configurator (see page 45) and save that also. Re-open the new configuration file for downloading.

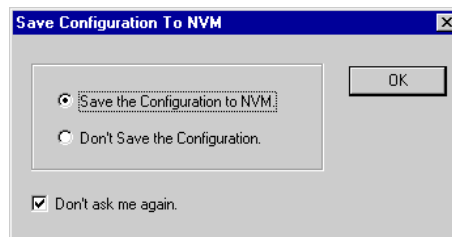
Do you want to overwrite the current configuration completely - or will you download the configuration first and save to NVM later (recommended).

To download a configuration file, without saving it to NVM:

- The BIM must be in communication with the Configurator.
- Open the required configuration file, if not already open.
- Click on the Network symbol in the Navigation Tree and select the Network Attributes tab.
- Ensure that the Automatic Store to NVM box is NOT checked.
- Click on the Download BIM icon on the Toolbar, or click Download BIM in the Configuration menu.

A box appears on screen to show the progress of the download. Towards the end of the download, a dialog box will ask if the configuration should be saved to non-volatile memory (NVM).

Figure 72 – “Save to NVM” dialog box



- Choose “Don’t Save the Configuration”
- Click the OK button when the transmission is 100% complete.

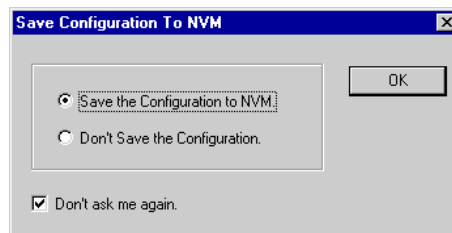
To download the configuration file and save it to NVM,

The BIM must be in communication with the Configurator.

- Open the required configuration file, if not already open.
- Click on the **Download BIM** icon on the Toolbar, or click **Download BIM** in the Configuration menu.

A box appears on screen to show the progress of the download. Towards the end of the download, a dialog box will ask if the configuration should be saved to non-volatile memory (NVM).

Figure 73 – “Save to NVM” dialog box



- Choose “Save the Configuration to NVM”

If the "Don't ask me again" box is checked ☒, then the question box will not appear in future and the configuration will get saved automatically to NVM. See also the File Attributes section.

- Click the OK button when the transmission is 100% complete.

Viewing the Error Log

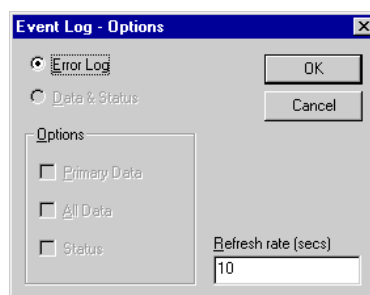
The Error log provides historical information about significant events for the BIM and I/O modules. The data must be read from the BIM and is therefore available only when the Mode is set to Manual or Auto.

To view the Error Log either:

- Choose the **Error Log** option on the Configuration Menu, or
- Right click on a BIM or module icon and select **Error Log** from the options

A dialog box appears offering different option.

Figure 74 - Event Log dialog box



Error Log

The Error Log provides a display of timed events that are significant in the operation of a BIM.

Data & Status

This option is not available at this time.

Options

These options are not available at this time.

Refresh rate

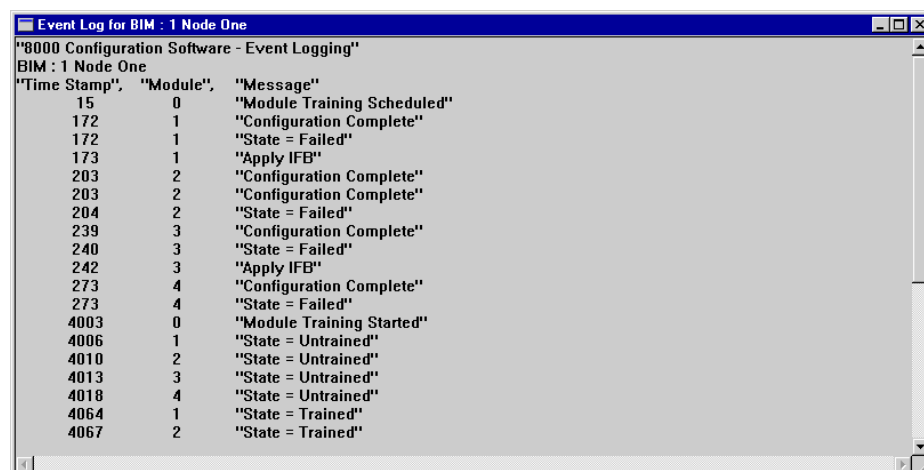
The rate at which the error log information is updated can be defined here. Enter a figure to specify how often the data should be checked for new information.

Click OK for an on-screen view of the Error Log.

The Error Log displays the event messages, each of which is accompanied by its time stamp and the identity of the module involved.

When the Event Log is displayed, the Menu bar changes. Three menu options are provided: Event Log, Window and Help.

Figure 75 - Error Log display



Refreshing the Error Log

The Menu Bar provides the option to Refresh the log. This adds any recent data to the screen list.


Saving the Error Log

To Save a copy of the log in comma separated value (.csv) format click Save in the Event Log menu option.

BIM tasks

Adding a BIM

To add a BIM to the network:

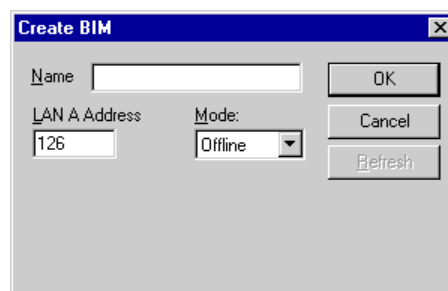
- Click the “New BIM” button  on the Toolbar

Alternatively, right click on the network symbol and choose **New BIM** from the options provided, or use the New | BIM options in the File Menu

- The **Create BIM** dialog box appears.

Note: As the LAN protocol was been defined when the configuration file was created, there is no need for a choice of alternative protocols.

Figure 76 – Create BIM dialog box



Name

This is descriptive, or tag, name for the BIM that the user can define. Up to 22 ASCII characters are permitted.

LAN A address

This is the address of the BIM on LAN A. The range of values permitted is 1 to 125. The host, as Master, has an address of 0. The default value is 126 and so this should be amended to the required value.

Mode

This parameter specifies whether the Configurator will get updated with dynamic data, i.e. real time BIM and module parameters, from the BIM.

See Mode (Edit Menu) for further details.

Deleting a BIM

- Click on the BIM icon in the Navigation Tree and then click on Edit | Delete. A dialog box appears and asks for confirmation:

“Are you sure you want to delete BIM xxxxx?”

- Confirm the delete by clicking Yes or click No to abort the action.

Note: Another way to delete a BIM is to right click the mouse while pointing at it. Choose Delete from the list of options. The same confirmation is required, as described above.

Editing BIM parameters

There are not many parameters that can be, or need to be, modified on the BIM. The details of the BIM parameters are provided on page 21.

Resetting the BIM

A BIM Reset will restart the BIM so that it adopts the states that are currently defined in NVM. A reset can be used:

- To make the BIM adopt new configuration details that have been downloaded to the BIM and saved in NVM.
- To restore the BIM to its previous configuration after (unsaved) changes to its configuration.

To reset the BIM:

- Click on the BIM icon in the Navigation Tree,
- Choose the Reset option from the Configuration Menu, or
- Right click on the BIM and choose the Reset option

Note: The Event Log is preserved in this process.

Setting and clearing BIM failsafe state

There may be occasions during commissioning when the BIM needs to be forced into a failsafe state. For example, the input and output states of the I/O modules can be checked when they also get forced into failsafe. After confirmation, the failsafe state can easily be cleared.

Setting to failsafe

To set a BIM into failsafe, select it in the Navigation Tree, then click on **Configuration | Set Failsafe** to enforce the command.

Note: This can also be achieved by right clicking on the BIM and selecting **Set Failsafe** from the option list provided.

Clearing failsafe

Select the BIM, then click on **Configuration | Clear Failsafe** to enforce the command.

Note: This can also be achieved by right clicking on the BIM and selecting **Clear Failsafe** from the option list provided.

Viewing BIM hardware, software and firmware release information

To see the versions of hardware, software and firmware that a BIM is using:

- Click on the BIM and then the BIM Properties tab. This will display all of the release details. A typical display can be seen on page 21.

Viewing BIM status parameters

To view the current status parameters for the BIM:


- Click on the BIM and then the Dynamic Data tab.

I/O module tasks

Adding a module

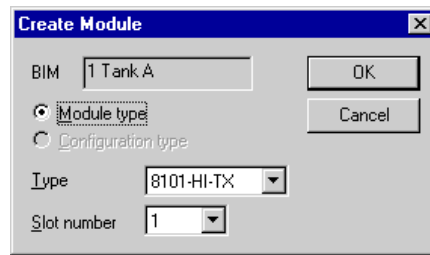
Up to 24 modules can be added to a Profibus BIM and up to 32 to a Modbus BIM.

To add a new module to a BIM:

- Click the “New Module” button  on the Toolbar.

Alternatively, right click on a BIM or module symbol and choose New Module from the options provided, or use the New | Module options in the File Menu

- The Create Module dialog box appears.

Figure 77 - Create module dialog box***BIM***

This identifies the BIM to which the additional module will be attached.

Module type/Configuration type

This choice is not currently available but is reserved for a future version.

Type

Choose from the drop-down list box the module type required. See Appendix A for a full list of available I/O modules.

Slot number

This defines the slot number the module will occupy. Choose from a range of 1 – 32 using the drop-down list box.

Deleting a module

- Click on the I/O module icon in the Navigation Tree and then click on **Edit | Delete**. A dialog box appears and asks for confirmation:

“Are you sure you want to delete Module xxxx-xx-xx at Slot x?”

- Confirm the delete by clicking **Yes** or click **No** to abort the action.

Note: Another way to delete a module is to right click the mouse while pointing at it. Choose Delete from the list of options. The same confirmation is required, as described above.

Resetting a module

A Reset will reinitialise the I/O module and restores its default power-up conditions – see the module’s data sheet for details. In the case of output modules, the output values are unchanged by a reset.

To reset a module:

- Click on the module icon in the Navigation Tree,
- Choose the **Reset** option from the Configuration Menu, or right click on the module and choose the **Reset** option

Editing module parameters

To edit the parameters for a module:

- Click on the module icon then click on the Channel Attributes tab.
- The parameters can then be modified according to the module type. See below for links to the individual module types.
- When the parameters have been modified, save the file and download it to the BIM (see page 48).

The Channel Attributes for each module type can be viewed at the following locations:

- DI modules – page 31
- DO modules – page 32
- AI modules – page 33
- TI modules – page 34
- AO modules – page 35
- PI modules – page 36

Setting and clearing I/O module failsafe state

An I/O module may need to be forced into failsafe, for example to check that it adopts the correct input or output values when it enters failsafe. After confirmation, the failsafe state can easily be cleared.

Setting to failsafe

To set a module into failsafe, select it in the Navigation Tree, then click on **Configuration | Set Failsafe** to enforce the command.

Note: This can also be achieved by right clicking on the module and selecting **Set Failsafe** from the option list provided.

Clearing failsafe

Select the I/O module, then click on **Configuration | Clear Failsafe** to enforce the command.

Note: This can also be achieved by right clicking on the I/O module and selecting **Clear Failsafe** from the option list provided.

Setting input module failstate values

If an input module fails, or enters a failsafe condition - an event that could be caused by loss of communications with the BIM - the input value could end up being undefined. To avoid this situation, a specific failstate can be defined for each channel in a module. In the event of the module entering failsafe, the BIM will report this value to the host as an indicator of its condition.

DI modules

DI modules can be set to adopt one of three **Failstate Values**, namely:

- Off
- On
- Hold Last Value

Choose the option that is required for each channel and then download the values to the BIM. See the **Channel Attributes tab – DI modules** on page 31 for further details of these fields.

AI & TI modules

AI and TI modules can be set to adopt one of four **Failstate Conditions**,

- Low
- High
- Hold Last Value
- Failstate Value

The **Failstate Value** option has a separate field that is used to define a specific percentage value anywhere in the range of the analog input.

Choose the option that is required for each channel and then download the values to the BIM. See the **Channel Attributes tab – AI modules** on page 33 for further details of these fields.

Note: The Configurator can be used to check that the module channels adopt the correct failstate value or condition by putting the module into failsafe. See Section 0 for details on performing this.

Setting output module failsafe values

If an output module enters a failsafe condition - an event that could be caused by loss of communications with the BIM, or by the BIM itself going into failsafe - the output value could end up being undefined. To avoid this situation, a specific failsafe condition can be defined for each channel in a module. In the event of the module entering failsafe, this value will be output to the field device until the module is recovered from failsafe.

DO modules

DO modules can be set to adopt one of three **Failsafe Values**

- Off
- On
- Hold Last Value

Choose the option that is required for each channel and then download the values to the BIM. The BIM will then pass the configuration information to the appropriate module(s).

See the **Channel Attributes tab – DO modules** on page 32 for further details of these fields.

AO modules

AO modules can be set to adopt one of four **Failsafe Conditions**

- Low
- High
- Hold Last Value
- Failsafe Value

The **Failsafe Value** option has a separate field that is used to define a specific percentage value anywhere in the range of the analog output.

Choose the option that is required for each channel and then download the values to the BIM. The BIM will then pass the configuration information to the appropriate module(s).

See the **Channel Attributes tab – AO modules** on page 35 for further details of these fields.

Note: The Configurator can be used to check that the module channels adopt the correct failstate value or condition by putting the module into failsafe. See Section 0 for details on performing this.

Setting pulse mode for a DO

In addition to the discrete On or Off states of the digital output module, a pulse mode is also available. Pulsed outputs can be either “single pulse” or “continuous pulse”. Most modules use the “static mode” recovery (see below) from a failsafe situation but certain modules (e.g. 8215-DO-IS) also have a “dynamic mode” of recovery.

Single pulse mode

This is a one-off event that sends out a pulse of defined width, or On Time. Because it is a single event the module will require a Reset to re-initialise it after the event.

Continuous pulse mode

This mode provides a continuous stream of pulses of defined width, or On Time occurring with a defined frequency, or Period.

There are also Static and Dynamic options for the Single and Continuous pulse modes. These define the behaviour of an output when entering or leaving the failsafe or inactive states.

Static mode

When the module enters failsafe, or is made inactive, then pulse mode is disabled, the channel is configured as a latched output and is driven to its failsafe value. The module must then be re-initialised by the BIM before it can be restored to an operational condition.

Dynamic mode

If the module enters failsafe, the output is driven to its failsafe value. If it is made inactive, the output is turned Off (i.e. de-energised). On leaving the failsafe or inactive state, the channel will resume operation with the previous configuration and output.

See **Discrete output modules** for details on selecting the **Operation mode** and the values and constraints when setting the **On-Time** and **Period**.

Activating/deactivating a channel

Individual channels in a module can be made active or inactive. Making any unused channels inactive can improve response times slightly by cutting down on unnecessary data traffic.

To make a channel active:

- Click on the module icon and then on the Channel Attributes tab
- Identify the channel of interest and then check ☒ the Active check box.

To make a channel inactive:

- Click on the module icon and then on the Channel Attributes tab
- Identify the channel of interest and then uncheck ☐ the Active check box.

Viewing module status parameters

To view the status parameters for a module, or its current statistics:

- Click on the module and then the Module Dynamic Data tab.

Upgrade analog module firmware

To upgrade the firmware of an analog module:

- Click on the module name/icon in the navigation tree
- Click **Configuration | Reprogram** or right click the name/icon and choose **Reprogram**

Choosing a revision level

- Click on the down arrow in the **Firmware Version** field
- Choose the required revision level and the **Versions** box will display the software component and the **(New)** version number for the chosen level.

Choosing the latest revision level

- Click on the **Select Latest** button and the display will show the latest revision level for comparison with what is currently loaded.

Downloading the firmware

- Click the OK button to start the download.

Note: The download will take a few minutes because of the speed of the communications link.

Appendix A

Safe area and 2/2 modules

DI modules

8-channel DI, 24 V dc isolated, sinking	8109-DI-DC
8-channel DI, 24 V dc non-isolated, device-powered	8110-DI-DC
16-channel DI, 24 V dc non-isolated, module-powered	8121-DI-DC
16-channel DI, 24 V dc isolated, sinking	8122-DI-DC
8-channel DI, 115 V ac isolated, sinking	8111-DI-AC
8-channel DI, 115 V ac non-isolated, device-powered	8112-DI-AC
8-channel DI, 230 V ac isolated, sinking	8113-DI-AC
8-channel DI, 230 V ac non-isolated, device-powered	8114-DI-AC

DO modules

8-channel DO, 2–60 V dc non-isolated, device-powered	8115-DO-DC
8-channel DO, 2–60 V dc isolated, unpowered	8117-DO-DC
8-channel DO, 20–265 V ac non-isolated, device-powered	8116-DO-AC
8-channel DO, 20–265 V ac isolated, unpowered	8118-DO-AC

AI modules

8-channel AI, 4–20 mA with HART	8101-HI-TX
8-channel AI, 4–20 mA	8103-AI-TX
8-channel AI, 1–5V	8119-VI-05

TI modules

4-channel Thermocouple	8105-TI-TC
4-channel RTD	8106-TI-RT

PI modules

2-channel pulse/frequency input	8123-PI-QU
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AO modules

8-channel AO, 4–20 mA with HART	8102-HO-IP
8-channel AO, 4–20 mA	8104-AO-IP

IS wiring 2/1 modules

DI modules

8/16-channel IS DI, switch/proximity detector	8220-DI-IS
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DO modules

4-channel IS DO, solenoid driver, IIC gas groups	8215-DO-IS
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AI modules

8-channel IS AI, 4–20 mA with HART	8201-HI-IS
8-channel IS AI, 0–10V / potentiometer input	8230-AI-IS

TI modules

8-channel IS Thermocouple	8205-TI-IS
8-channel IS RTD	8206-TI-IS

PI modules

2-channel IS pulse/frequency input	8223-PI-IS
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AO modules

8-channel IS AO with HART, 4–20 mA	8202-AO-IS
8-channel IS AO, 4–20 mA	8204-AO-IS

Appendix B

Glossary of Terms

AI

Analog input. Usually applied to a type of I/O module.

AO

Analog output. Usually applied to a type of I/O module.

BIM

A Bus Interface Module which manages communications between the I/O modules and the Host/LAN.

Carrier

A mounting platform for MTL8000 modules; also provides electrical interconnections for them via the in-built bus (Railbus).

DI

Discrete input. Usually applied to a type of I/O module.

DO

Discrete output. Usually applied to a type of I/O module.

Fieldbus

A generic term for the different communication protocols used in process control applications.

HART®

HART is a global protocol for communication with “smart” field devices. Digital data to and from the field device is superimposed on the conventional analog signal. This data can be used for remote management of the field device (e.g. calibration). HART® is a registered trademark of the HART Communications Foundation.

I/O module

An interchangeable module that handles signals to or from the process sensors or controls. Modules can contain four, eight or sixteen-channels, according to type, for analog and discrete (switched) inputs and outputs.

LAN

A Local Area Network is a method of distributing communication and control signals around a site, usually using coaxial or twisted-pair cabling. A LAN interconnects MTL8000 and the host controller.

Mode

Modes define how the BIM will use the available LAN(s) and its configuration port. A mode will also define how the BIM will manage redundant LANs in order to maintain communications.

Module carrier

A carrier that holds either up to four or up to eight I/O modules only. One or more module carriers connect to a node services carrier.

Node

The collective name given to a group of MTL8000 modules that serves a local group of field instruments and controls.

Node Services Carrier

A 'master' carrier that houses a BIM and may sometimes accommodate one or more power supply modules and I/O modules.

NSM

Node Services module. A module that mounts beside the BIM, containing flash memory for the node configuration together with addressing and auto-configuration switches.

NVM

Non-volatile memory. A re-writable memory storage device in a BIM that holds configuration data.

Passthrough

The ability to pass HART data through a module even though the module has no intrinsic HART capabilities of its own.

PI

Pulse (frequency) input. Usually applied to a type of I/O module.

Railbus

Proprietary serial bus which carries control information and power. It is distributed to modules on the carriers and can be linked from one carrier to the next.

RTD

Resistance transmitter device. A type of field sensor for temperature measurement.

TI

Temperature (analog) input. Usually applied to a type of I/O module.

THC

Thermocouple. A type of field sensor for temperature measurement.

Appendix C

Security access levels

The following table describes the levels of security access and the capabilities assigned to that access category. The lowest level is **Read Only** and the top level is **User Engineer (config.)**. Higher categories have the access features of all those below them.

<i>Access category</i>	Feature
User Engineer (config.)	Create new file Save a file Edit the Railbus Pending timeout Reset a BIM Reset a module Download a changed configuration to a BIM Set / Clear Railbus CPU Failsafe Request firmware download to Railbus CPU Request firmware download to Application CPU Request firmware download to modules
User Engineer (no config.)	Add BIMs to the File Level display Remove BIMs from the File level display Set the BIM Refresh Attribute to Manual Set the BIM Refresh Attribute to Automatic Modify the Auxiliary link protocol parameters Remove the configuration of a module Display the Error Log for a BIM Administer user names, passwords and authorities Change own password Screen refresh Import configuration
User Technician	Print a file Set / clear a module's Failsafe State Edit the LAN node address Modify the BIM auxiliary port node address Edit and download BIM descriptive text
Read Only mode	Read only access

Software revision history

Version	Date	Details and supported features
2.01	May 2001	Beta version
2.02	Oct. 2001	Initial release
2.10	Nov. 2001	Upgrade: <ul style="list-style-type: none">• support for new I/O modules• support for Node Services module (NSM)• bug fixes
2.20	Apr. 2002	Upgrade: <ul style="list-style-type: none">• support for new I/O module• support for Version 2 Profibus BIM

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