Vibro-Meter

SOFTWARE MANUAL

IRC 4 Configurator

for

Intelligent Relay Card Configuration

Vibro-Meter SA
Route de Moncor 4
CH - 1701 Fribourg
SWITZERLAND

www.vibro-meter.com

IRC 4 Software Manual MAIRC4-SW/E
Edition 1 - Feb 11/08

MEGGiTT

REVISION RECORD SHEET

Edition	Date of Issue	Written by Modified by	PM No.	Description	Signature
1	--	S. Trono	- - -	Original edition (Software Release 1.00).	ST

	Department	Name	Date	Signature
Technical content of original issue approved by	Development	G. Clavien	24.07.08	GC
	Product Management	S. Adamo	04.04.08	SA
Document released by	Technical Publications	S. Trono	04.04.08	ST

The duly signed master copy of this page is stored by the Technical Publications Department of Vibro-Meter S.A. and can be obtained by writing to the Technical Publications Manager.

IMPORTANT NOTICE

All statements, technical information, and recommendations in this document which relate to the products supplied by Vibro-Meter SA are based on information believed to be reliable, but unless otherwise expressly agreed in writing with Vibro-Meter the accuracy or completeness of such data is not guaranteed. Before using this product, you must evaluate it and determine if it is suitable for your intended application. Unless otherwise expressly agreed in writing with Vibro-Meter, you assume all risks and liability associated with such use. Vibro-Meter takes no responsibility for any statements related to the product which are not contained in a current English language Vibro-Meter publication, nor for any statements contained in extracts, summaries, translations or any other documents not authored and produced by Vibro-Meter.

Published and printed by Vibro-Meter SA in Fribourg, Switzerland

THIS PAGE INTENTIONALLY LEFT BLANK

PREFACE

About this manual

This manual describes the software IRC4 Configurator. It explains how to install and begin using the software, and provides instructions on configuring the IRC 4.

NOTE : This document must be read in conjunction with the *Machinery Protection System Hardware Manual* (MAMPS-HW/E).

Who should use this manual

This manual is intended for operators of machinery protection systems using the IRC 4 Configurator software.

Applicability of this manual

NOTE : This manual applies to Version 1.0 of the IRC4 Configurator software. It reflects the features available with Version 1.0 and may not be applicable to later versions of the software.

Related documentation

The following documents are to be used in conjunction with this manual:

- *VM600 MPS Hardware Manual*
  Vibro-Meter Document No. MAMPS-HW/E
- *MPS1 Configuration Software for Machinery Protection System Manual*
  Vibro-Meter Document No. MAMPS1-SW/E

Related softwares

The following softwares are to be used in conjunction with the IRC4 Configurator Software:

- *MPS1 Configuration Software for Machinery Protection System*
- *Microsoft Excel*

SAFETY

Symbols and styles used in this manual

The following symbols are used in this manual where appropriate :

The WARNING safety symbol

THIS INTRODUCES DIRECTIVES, PROCEDURES OR PRECAUTIONARY MEASURES WHICH MUST BE EXECUTED OR FOLLOWED. FAILURE TO OBEY A WARNING CAN RESULT IN INJURY TO THE OPERATOR OR THIRD PARTIES.

The CAUTION safety symbol

This draws the operator's attention to information, directives or procedures which must be executed or followed. Failure to obey a caution can result in damage to equipment.

NOTE : This is an example of the NOTE paragraph style. This draws the operator's attention to complementary information or advice relating to the subject being treated.

TABLE OF CONTENTS

1 INTRODUCTION

1.1 What is IRC 4 configurator?

IRC 4 Configurator is a configuration software for Vibro-Meter's Intelligent Relay Card IRC 4.

1.2 Product features

The main features of the software are:

- Extract the rack configuration (.rck file) generated with MPS software
- Extract the logical equations from the VM600 Excel file
- Check the syntax of these equations
- Translate the equations into binary code
- Download the binary code to IRC 4 card via RS-232 port
- Import the binary code from the IRC 4 card via RS-232 port

1.3 Operating principle of the software

The IRC4 Configurator is used to create the configuration file that will be downloaded to the IRC 4 card. To generate that binary file, the software requires two other files that will be processed together. The first file required is an Excel spreadsheet containing the logical equations. The second one is a .rck file that was previously created with the MPS1 software.

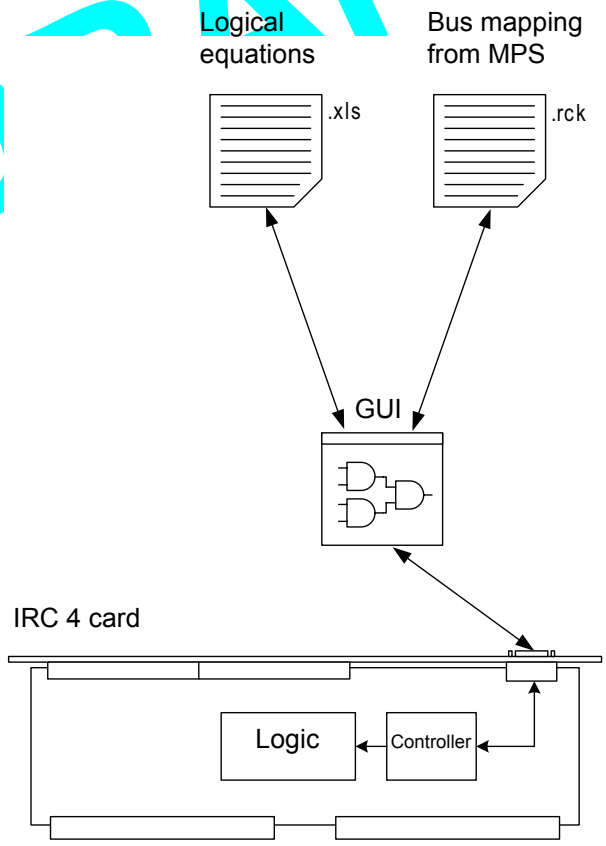


Figure 1-1 : IRC 4 data flow, stand alone configured with a GUI

THIS PAGE INTENTIONALLY LEFT BLANK

2 INSTALLING THE SOFTWARE

2.1 Before you begin

2.1.1 Items delivered

For first-time installation, you should have received the following items :

- 1 CD-ROM containing:
  - The IRC 4 Configurator software
  - An electronic version of the software manual (PDF file):
    IRC 4 *Configurator Software for Intelligent Relay Card Configuration*
    Vibro-Meter Document No. MAIRC4-SW/E
- 1 Paper copy of the instruction manual:
  IRC 4 *Configurator Software for Intelligent Relay Card Configuration*
  Vibro-Meter Document No. MAIRC4-SW/E
- 1 RS-232 communication cable

NOTE : All original CD-ROMs should be stored in a safe place once the software installation has been performed.

2.1.2 System requirements

The IRC4 Configurator program may be installed on most modern lap-top personal computers.

The following minimum computer configuration is required to run the program:

- Microsoft Windows XP
- PC with 1Ghz X86 processor
- 256 MB of RAM
- 100 MB of available hard disk space
- CD-ROM drive
- 1024x768 or higher video resolution
- 1 serial interface RS-232 compliant or an USB to serial converter
- Mouse or pointing device

The following requirement are recommended:

- Microsoft Windows XP
- PC with 1Ghz Dual Core X86 processor
- 512 MB of RAM
- 100 MB of available hard disk space
- CD-ROM drive
- 1280x1024 video resolution
- 1 serial interface RS-232 compliant or an USB to serial converter
- Mouse or pointing device

2.2 Installation procedure

NOTE : Save your work and close all applications before beginning the installation.

The procedure below is valid for first-time installation of the software as well as for subsequent installation of software releases.

NOTE : It is essential that you remove any previous versions of the software before installing the new version. Refer to 2.3 - Removing an old version of the software.

1- Insert the CD-ROM containing the IRC4 Configurator in the CD drive of your PC.

The installation process should start automatically. If this is the case, the IRC4 Configurator software wizard starts (the opening screen of this is shown in Fig. 3-1). Go to step 5.

If the process does not start automatically, go to step 2.

2- Choose **Start > Run** from the Windows task bar.

3- Use the Browse function to find the executable file `setup.exe` in the root directory of the CD-ROM.

4- Select and run the `setup.exe` file to start the IRC4 Configurator Software wizard (see Figure 2-1).

Figure 2-1 : The opening screen of the IRC4 Configurator Software wizard

5- Follow the instructions in the wizard to install the software.

6- Define the location where the software is to be installed on the hard disk. The following default destination folder is proposed :

`C:\Program Files\VibroMeter\IRC4Configurator`

An alternative folder can be chosen if desired.

A folder named VibroMeter containing the **IRC4 Configurator** program icon appears in **Start > All Programs** when the installation is complete.

2.3 Removing an old version of the software

NOTE : Save your work and close all applications before removing an old version of the software.

2.3.1 Removing the software

Use the procedure below to remove an old version of the software before installing a newer version:

1- Choose **Add/Remove Programs** from the **Control Panel**.

2- Select the **Change or Remove Programs** option.

3- Highlight the application (“IRC4 Configurator”) and click on the **Remove** button.

THIS PAGE INTENTIONALLY LEFT BLANK

3 GETTING STARTED

3.1 Starting the IRC4 Configurator

To start the IRC4 Configurator software, click the IRC4 Configurator icon in **Start > All Programs > VibroMeter**.

This icon was created during the installation of the software. If for some reason it does not appear browse to the directory `VibroMeter\IRC4 Configurator` on your hard disk and double-click the file `IRC4 Configurator HMI.exe`.

The IRC4 Configurator screen as shown in Figure 3-1 appears.

Figure 3-1 : The IRC4 Configurator screen

The main window is divided into two parts:

- The left toolbar which contains the main user commands:
  - Import Files
  - Files Analyse
  - LI Code Generator
  - Download To Board
  - Import From Board
  - Board Status
  - Import XML File
  - Save XML File
  - Settings
  - About
  - Quit
- The main information panel

3.2 Settings

Click on the **Settings** button on the left toolbar to display the settings window as shown in Figure 3-2.

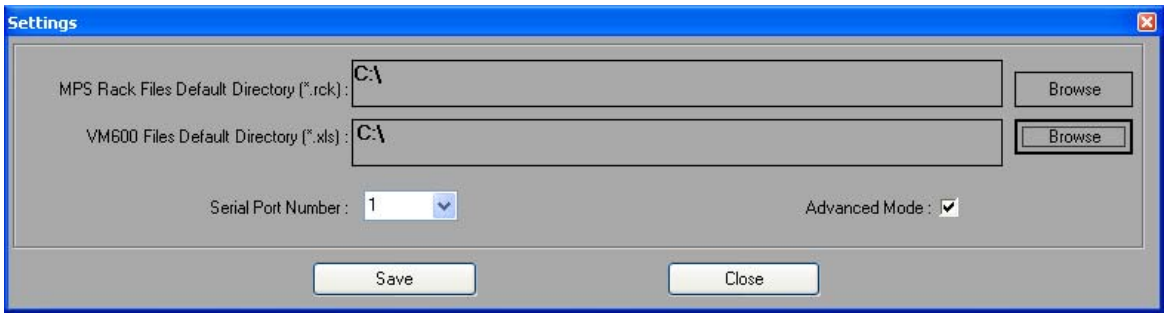


Figure 3-2 : The Settings window

The settings window allows you to define the default directories for the MPS Rack Files (.rck) and for the VM600 Files (.xls) and to define the number of the serial port to communicate with the card.

Selecting the Advanced Mode enables the following extra feature (accessed via right click on the **Navigator** menus):

- Compare with board

The **Save** button allows you to save the settings into an XML Configuration file (i.e: IRC4 Configurator HMI.exe.config) located in the application directory.

4 CONFIGURING THE IRC 4

4.1 Introduction

This chapter describes how to create the binary configuration file that will be downloaded to the card.

The sequence of the steps to go through when creating the configuration is the same as the order of the buttons on the left toolbar.

4.2 Importing files

To begin the configuration you will first have to import the two files created previously.

NOTE : Refer to section 6.1- Creating the file containing the logic to learn how to create the VM600 Excel file.

NOTE : Refer to section 6.2- Creating the MPS rack file to learn how to create the MPS Rack file.

Click on the **Import Files** button on the left of the main window to open the **Import Configuration Files** window (see **Figure 4-1**).

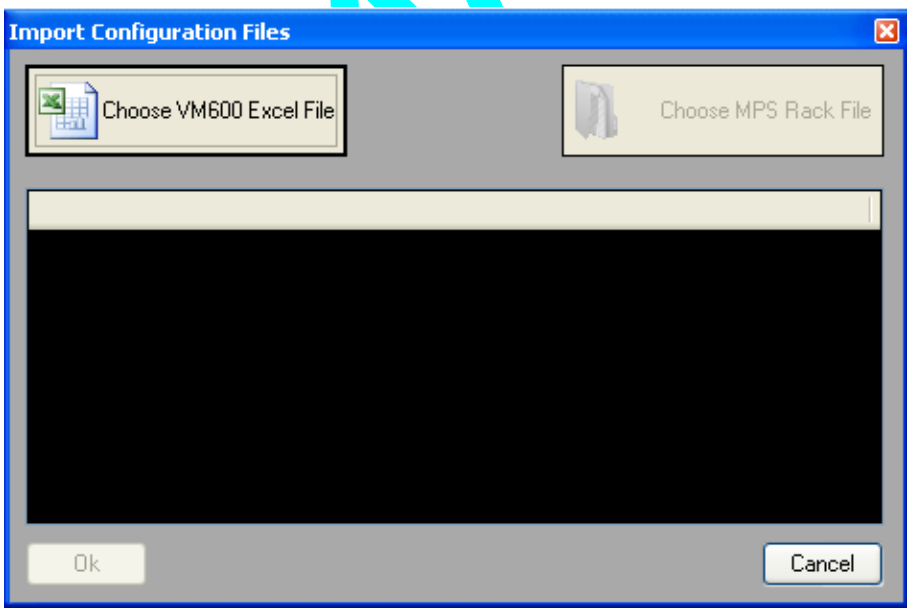


Figure 4-1 : Import Configuration Files dialog box

Click on the left button named **Chose VM600 Excel File**. An open file dialog box appears. Select the Excel file containing your logical equations and then click **Open**. Then click on **Choose MPS Rack File** and select the corresponding .rck file.

The status window indicates some information about the import which are described in Table 4-1.

Table 4-1: Description of the status messages when extracting data

Status Message	Description
`Launching Excel Process.`	Excel process is launched on the background
`Loading Excel File.`	Loading the VM600 File
`Extracting IRC Relays worksheet.`	Try to find the IRC Relays spreadsheet
`Analysis In Progress...`	Checking Excel fields
`Relay X is linked to relay Y`	Indicates that Relay number X is linked to the relay number Y (Logic will be the same for these relays)
`IRC Relays Configuration Slot X OK`	IRC 4 configuration analyse for the board on slot X is done
`IRC4 Board Slot X Configuration Imported.`	The entire worksheet has been processed
`OC Bus is not defined.`	OC Bus symbols are not defined in the rack file
`Warning: Linked Relay X (Latch, Conf Time or NE/NDE) doesn't correspond to relay Y`	Relay N is linked to relay N+1, so parameters have to be equals. If not, a warning is set and master relay parameters are applied
`Unable to find the worksheet IRC Relays`	IRC Relays worksheet doesn't exist in the Excel spreadsheet
`Excel Header doesn't equal to Relay configuration IRC SLOT!`	Excel Header mismatch with "Relay Configuration IRC Slot X"
`IRC4 Slot Number duplicated, Slot Number: X`	More than one configuration for a slot was found

When the import of both files is finished and successful, the window **Import Configuration Files** should look like in Figure 4-2 and the **File Analyse** button in the toolbar becomes enabled.

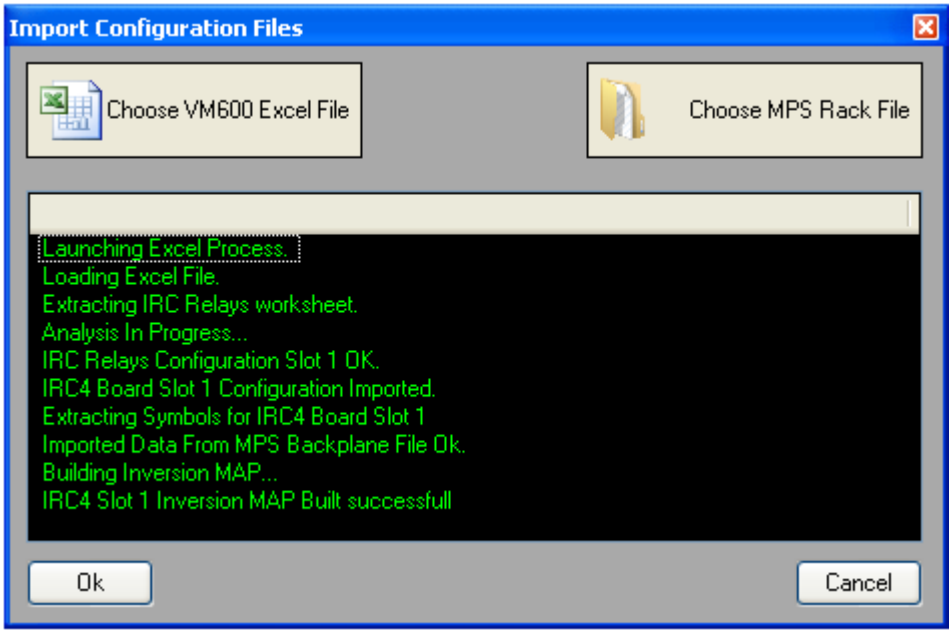


Figure 4-2 : Import Configuration Files dialog box after successful import

4.3 Analysing files

Clicking on **Files Analyse** will launch a syntactic analyser (Figure 4-3).

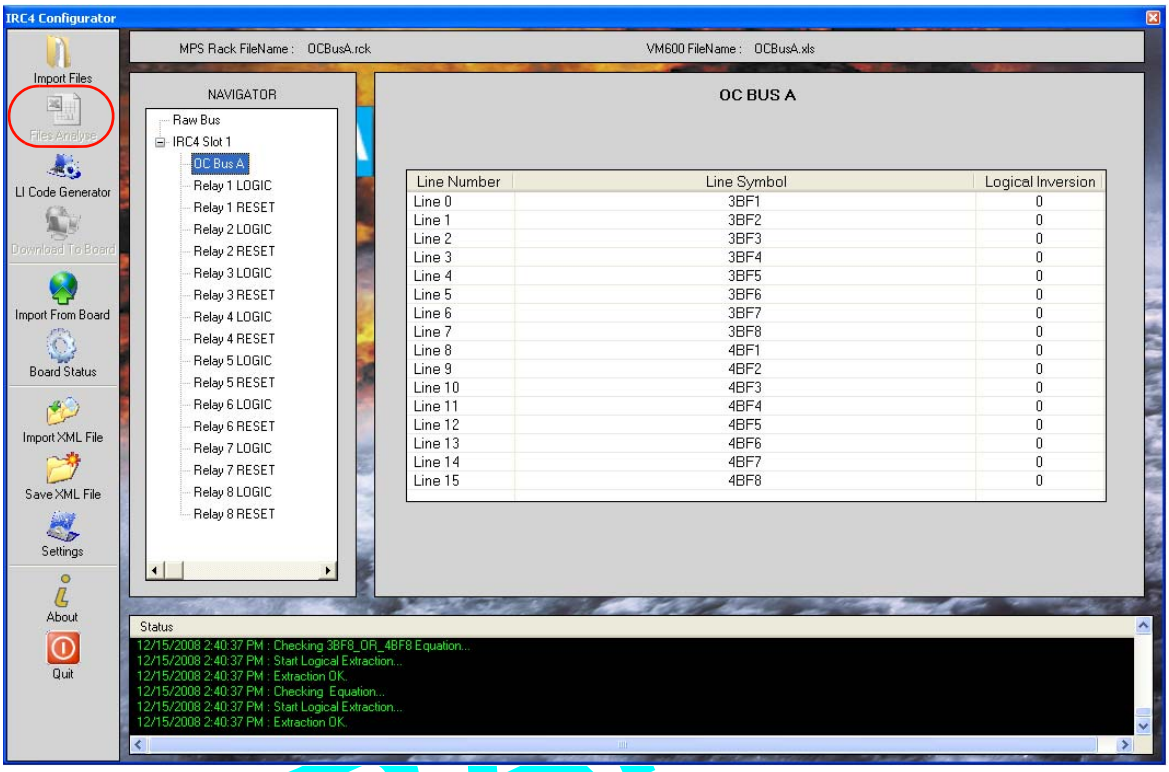


Figure 4-3 : IRC4 Configurator window during the File Analyse step

The bottom **Status** list box displays the progression of the analysis. The descriptions of the status messages is presented in Table 4-2.

Table 4-2: Description of the Status messages when analysing files

Status Message	Description
`Checking Logical Equation In Progress...`	Syntactic Analyser is loaded
`Checking` ***`Output Tag`*** `Equation`	Syntactic Analyser starts to check the "Output Tag" Equation
`Start Logical Extraction...`	Checks Symbols Names and checks the Logic
`Extraction OK.`	Equation is correct
`Unknown symbol:` ***`XXXX`***	Symbol XXXX is not defined neither in Raw Bus nor in OCbus nor in Internal variables
`Incorrect syntax ("Symbol Missing before"):` ***`Equation`***	A symbol is missing before a "OR" or a "AND"
`Incorrect Syntax Relay` ***`X`*** `tag:` ***`Output Tag`***	A syntax error is present

Once the file analysis has been successfully executed, the **LI Code Generator** button becomes enabled.

4.4 LI Code generation

Click on the button **LI Code Generator** on the left toolbar to start the generation.

The bottom **Status** list box displays the generation progression (Figure 4-4).

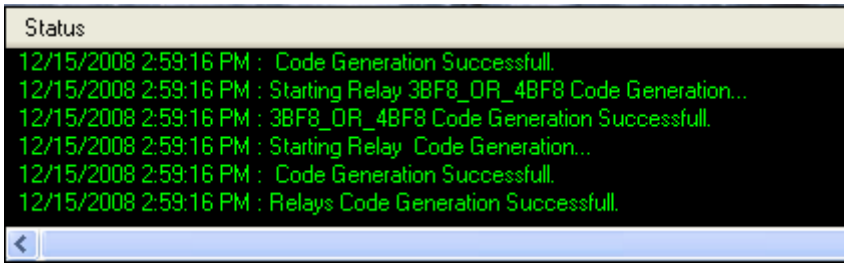


Figure 4-4 : Status log after successful LI code generation

Table 4-3 presents the status messages and their description.

Table 4-3: Description of the Status messages when generating LI Code

Status Message	Description
`Starting LI Code Generation`	LI Generator is loaded
`Starting Relay` ***`Output Tag`*** `Code Generation`	LI Generator starts to generate the “Output Tag Equation”
`Output Tag` `Code Generation Successful`	LI Code has been successfully generated

4.5 Downloading data to IRC 4 card

Once LI code has been successfully generated, the button **Download To Board** on the left of the main window becomes enabled. Click on this button to download the configuration to the card.

The following **Download TO IRC 4 Board** window appears (Figure 4-5).

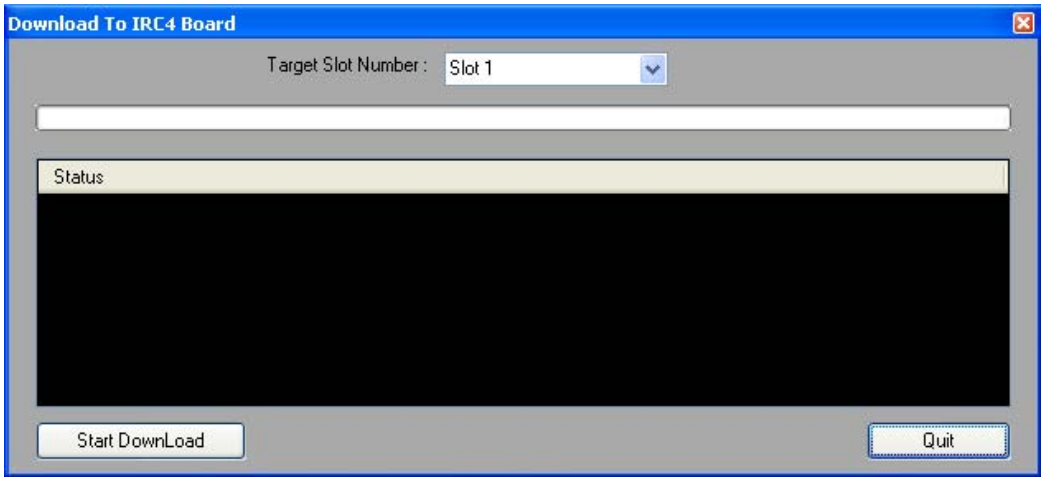


Figure 4-5 : Download to IRC 4 Board window

Select the correct slot and click on the **Start Download** button.

If the **Target Slot Number** entered doesn't correspond to the slot number of the card, a warning message appears. If you want to start the download anyway click **Yes** or click **Cancel** if you want to abort it.

NOTE : Even though the data can be downloaded to the card entering a wrong slot number in the "Target Slot Number" field, it is strongly advised to select the correct value in order to prevent later configuration errors and facilitate debugging whenever needed.

After the download is complete, click **Quit.**

At this point your card is configured according to the VM600 Excel file logical equations and the MPS Rack file bus mapping.

THIS PAGE INTENTIONALLY LEFT BLANK

5 ADVANCED FUNCTIONS

5.1 Importing data from IRC 4

The IRC4 Configurator offers the possibility to import data from a card that has been previously configured.

To import data from the IRC 4 card, click on the **Import From Board** button on the left toolbar.

The **Import Configuration From IRC 4 Board** window shown on Figure 5-1 appears.

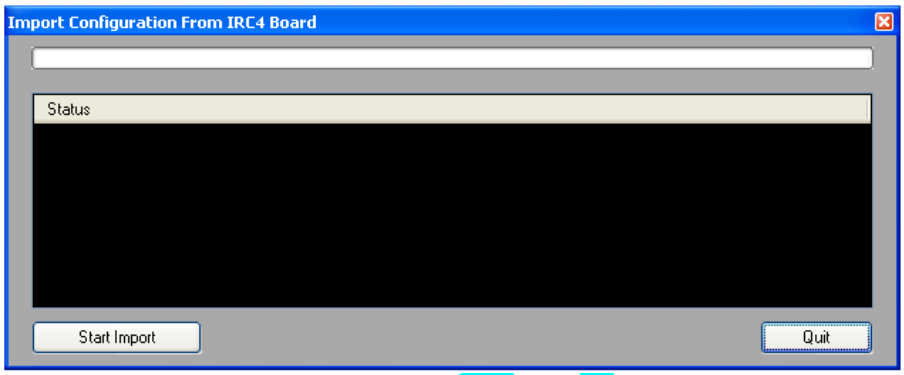


Figure 5-1 : The Import Configuration From IRC 4 Board window

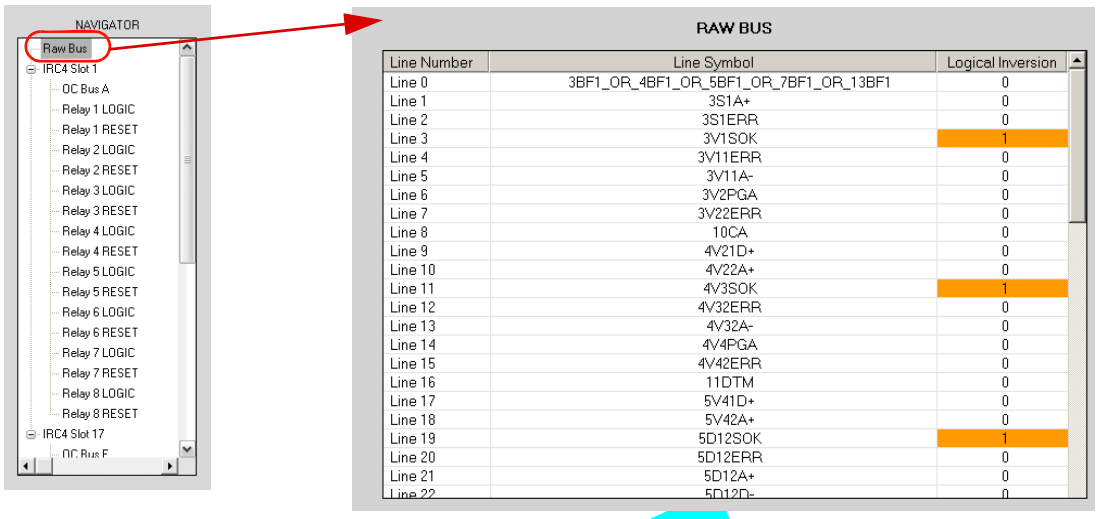
Click on **Start Import** to import data from the card. IRC4 Configurator retrieves the slot number and the logic from the board, then the user has the possibility to load the corresponding MPS rack file (.rck) to display the “Line Symbol” in the OC/Raw Bus display (refer to Section 5.2). If no MPS file is loaded the default names will be displayed instead.

Finally the IRC4 Configurator launches the reverse LI Code generation to retrieve the logic in “string” format.

5.2 Displays

5.2.1 Raw bus display

If you click on **Raw Bus** in the **NAVIGATOR** window, the Raw Bus display as presented in Figure 5-2 is visible.



Line Number	Line Symbol	Logical Inversion
Line 0	3BF1_OR_4BF1_OR_5BF1_OR_7BF1_OR_13BF1	0
Line 1	3S1A+	0
Line 2	3S1ERR	0
Line 3	3V1SOK	1
Line 4	3V11ERR	0
Line 5	3V11A-	0
Line 6	3V2PGA	0
Line 7	3V22ERR	0
Line 8	10CA	0
Line 9	4V21D+	0
Line 10	4V22A+	0
Line 11	4V3SOK	1
Line 12	4V32ERR	0
Line 13	4V32A-	0
Line 14	4V4PGA	0
Line 15	4V42ERR	0
Line 16	11DTM	0
Line 17	5V41D+	0
Line 18	5V42A+	0
Line 19	5D12SOK	1
Line 20	5D12ERR	0
Line 21	5D12A+	0
Line 22	5D12D-	0

Figure 5-2 : The Navigator and Raw Bus Display

The **Raw Bus Display** is divided into three columns; the line number, the line symbol and the logical inversion columns.

The logical inversion refers to the parameter entered in the MPS Software when defining logical combinations of alarms for the AMC 8 card (refer to Section 13.3 of MPS1 Software Manual).

- 1 means that the result of the equation is inverted
- 0 means that the result of the equation is NOT inverted

NOTE : Take care not to mix up “Logical Inversion” and “Normal State”, they both are reserved words:
Logical Inversion refers to the logical combinations of the AMC 8 which can be either active to “1” or “0”.
Normal State means that everything is in “OK” state. “Sensor OK” have a Normal State equal to 1 and Dangers have a Normal State equal to 0.

By clicking on the line symbol, a tool tip message appears, indicating the function (see Figure 5-3).

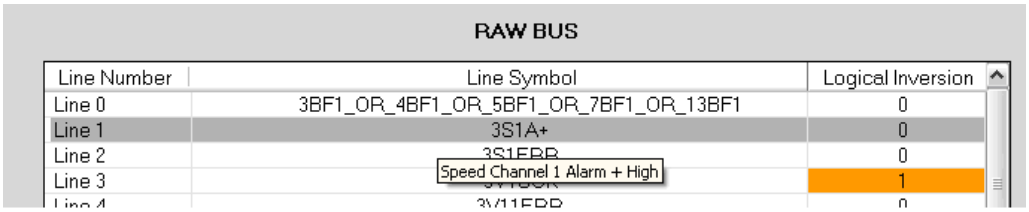


Figure 5-3 : Tool tip message in the Raw Bus frame

5.2.2 OC bus display

Figure 5-4 shows the OC Bus frame. The features are the same as for the Raw Bus.

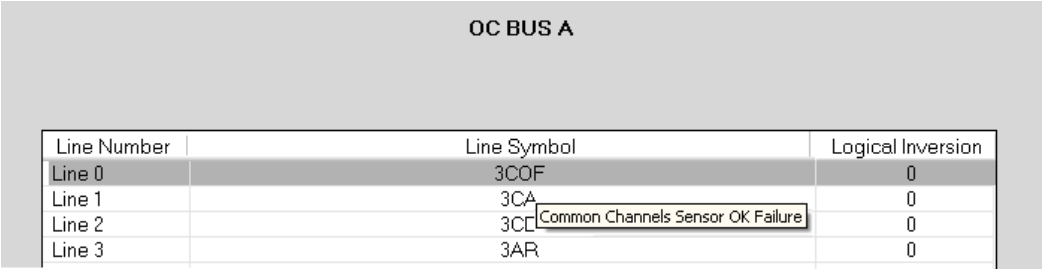


Figure 5-4 : Tool tip message in the OC Bus frame

5.2.3 Relay display

Figure 5-5 shows the appearance of the **Relay** display.

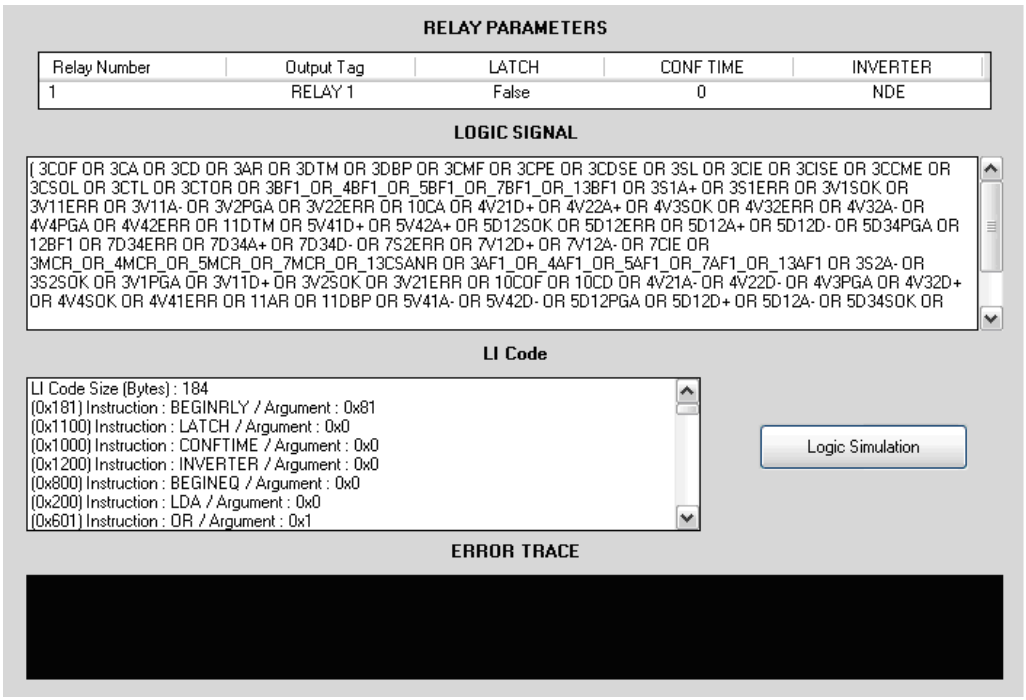


Figure 5-5 : Relay Display

The frame is divided into four parts:

- **Relay Parameters:** Displays relay number, output tag, latch, conf time and inverter parameters.
- **Logic Signal:** Displays the logical equation.
- **LI Code:** Displays the intermediate language generated by the LI Code generator
- **Error trace:** Displays the syntax analyser and LI Code generator log.

NOTE : The **LI Code** box is only available in advanced mode. Please refer to Section 3.2 for more information on how to select the advanced mode.

The **Logic Simulation** button launches the IRC 4 Card Simulator to test the logic. See Section 5.3 for more information.

5.3 Testing the logic

The IRC4 Configurator software offers the possibility to simulate the IRC 4 embedded software to test the logical equations before they are downloaded to the card.

To open the simulator, click on the **Logic Simulation** button from the Relay frame (see Figure 5-6).

NOTE : The **Logic Simulation** button is enabled only if the LI Code generator has been successfully performed.

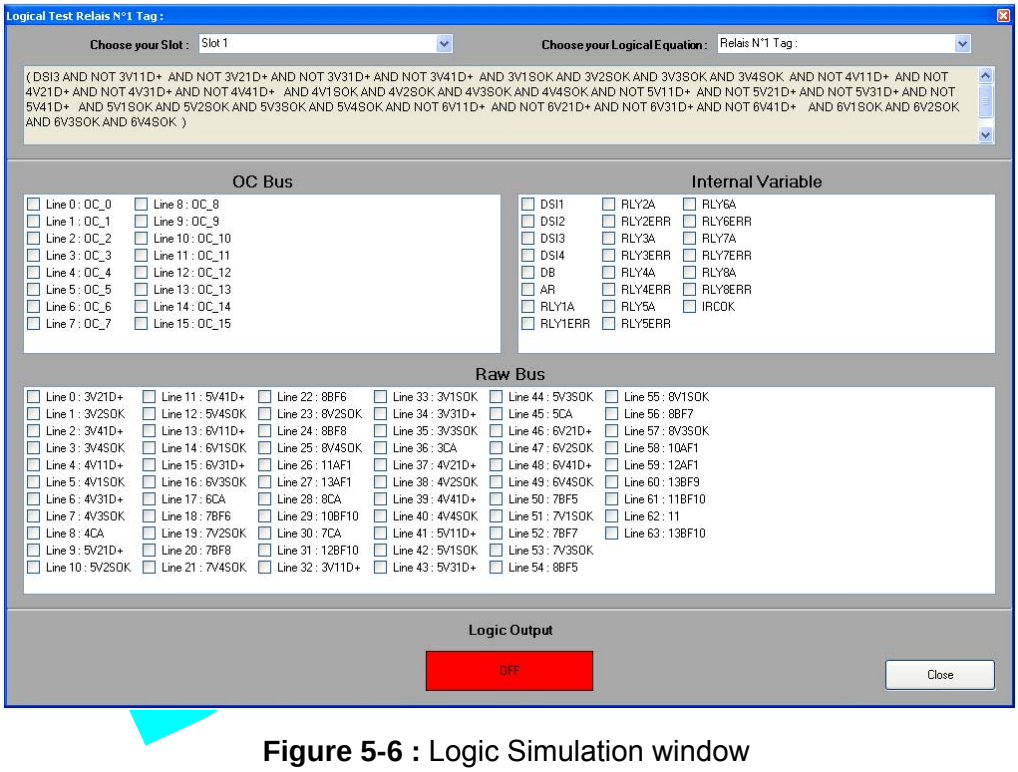


Figure 5-6 : Logic Simulation window

In the upper left corner of the window, the user can select the slot to be used by the IRC 4 card.

In the upper right corner, the user can choose the relay and it's corresponding equation is displayed right under these two menus.

To activate or deactivate a line, just click on it's checkbox. The **Logic Output** coloured box at the bottom of the window turns green when the logical equation is satisfied.

The user must be aware of the following points when using the Simulator. The simulator ignores:

- The Logical Inversion and the Normal State
- The **Conf Time** parameter
- The **Latch** parameter
- The **NE/NDE** parameter
- The Reset prevalence

5.4 Comparing online/offline configurations

The configuration saved on the card can be compared to another configuration. To do so, generate the LI Code for the configuration you want to compare and right click on the IRC 4 Slot from the navigator, select **Compare With Board** to launch the automatic board import (see Figure 5-7).

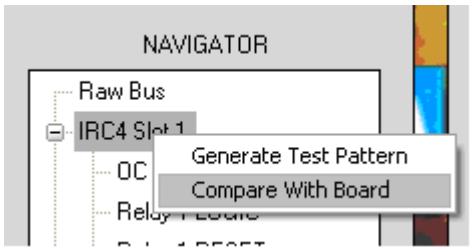


Figure 5-7 : Logic Simulation window

NOTE : The **Compare With Board** option is only available in advanced mode. Please refer to Section 3.2 for more information on how to select the advanced mode.

5.5 Loading/saving an XML configuration file

At any time, you can save the actual configuration in an XML file by clicking on the **Save XML File** button in the left toolbar.

This feature can be very useful to archive configurations in a single file.

NOTE : It is recommended to save each valid configuration (after a successful LI code generation or after a download).

You can easily load a saved configuration by clicking on **Load XML file**. To avoid corrupted data, you have to perform a syntax analysis and a LI code generation before you download the configuration to the card.

5.6 Monitoring the IRC 4 card

The input values and the states of the relays can be monitored using the **Board Status** function. To obtain the window shown on Figure 5-8, click on the **Board Status** button on the left toolbar.

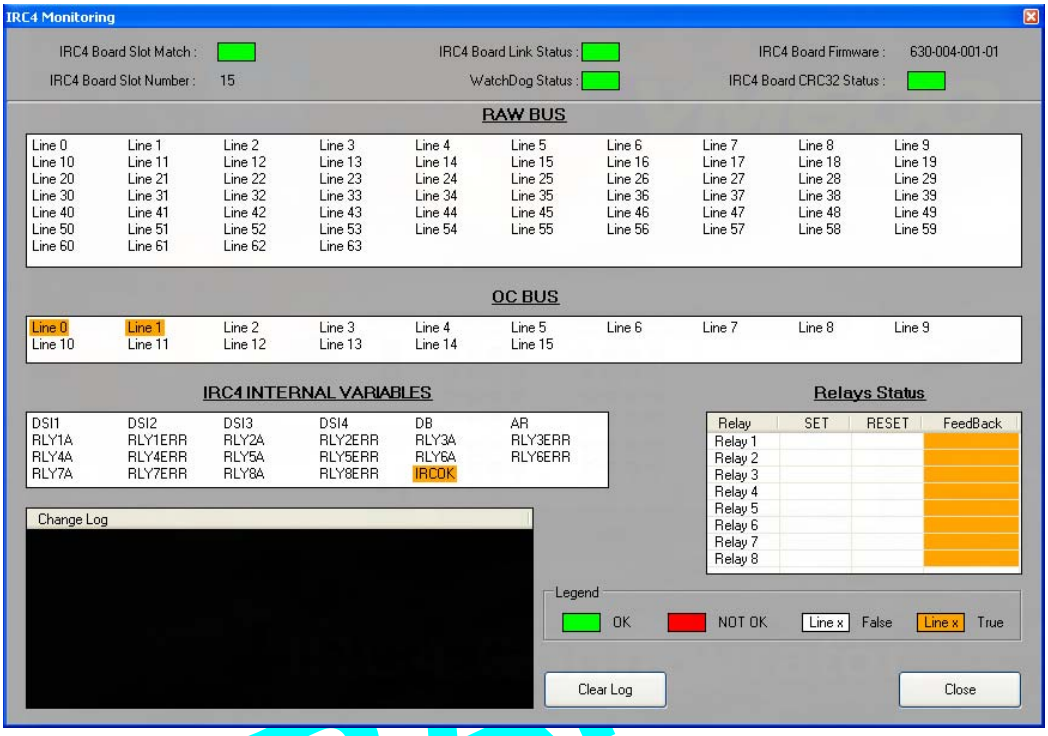


Figure 5-8 : Board status

The following areas of this window are described below.

IRC 4 Board Slot Match	The slot number coded on the card through a DIP switch is compared to the one on the backplane of the VM600 rack. If they are both the same the box becomes green.
IRC 4 Board Link Status	When the IRC 4 card is connected to a PC through the RS-232 port and the IRC 4 Configurator software can communicate with the board, the box becomes green. If the box is red, there is a communication problem between the PC and the card.
IRC 4 Board Firmware	The version of the firmware of the card.
IRC 4 Board Slot Number	The slot number coded on the card.
WatchDog status IRC 4	A watch dog monitors that the card is working properly.
IRC 4 Board CRC32 Status	The internal configuration is tested at power up.
RAW BUS	Indicates in orange which line of the Raw bus is active (grounded).
OC BUS	Indicates in orange which line of the OC bus is active (grounded).

IRC 4 INTERNAL VARIABLES	The variables of the IRC 4 which are activated are highlighted in orange: DSI: Discrete Signal Input DB: Danger Bypass input AR: Alarm Reset input RLYnA: Relay status (n is the relay number from 1 to 8) RLYnERR: There is a Relay Error when the state of RLYnA is different from the state of FEEDBACK, when NDE is selected. Otherwise, when NE is selected there is a Relay Error when the states of RLYnA and FEEDBACK are the same (see Figure 5-9). IRCOK: Shows wether there is a hardware error or not
Relays Status	Describes the status of the relay: SET: Coloured if the relay is active (logical equation for relay n is true), the corresponding relay variable will be highlighted in orange simultaneously RESET: Coloured when the RESET equation of the relay in question is verified FEEDBACK: True when RLYnA is true and NDE is selected or when RLYnA is false and NE is selected (see Figure 5-9).
Change Log	The changes are logged in this field.

The following Figure 5-9 shows a scheme of the relay circuit and the related variables.

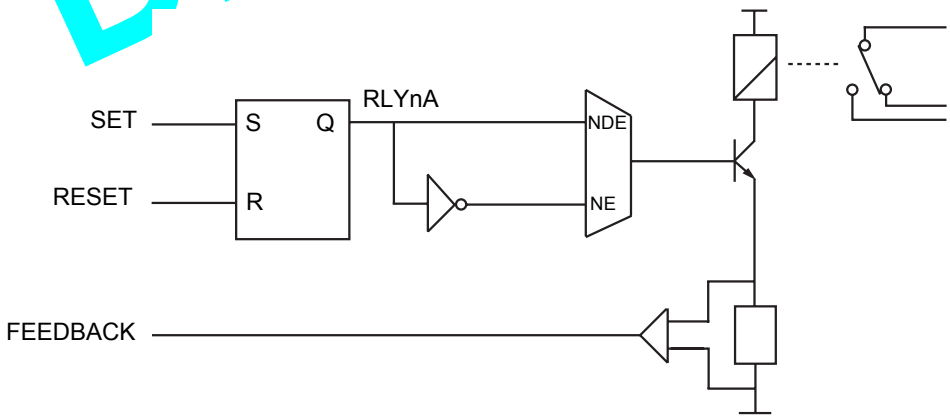


Figure 5-9 : Scheme of the relay circuit and its variables

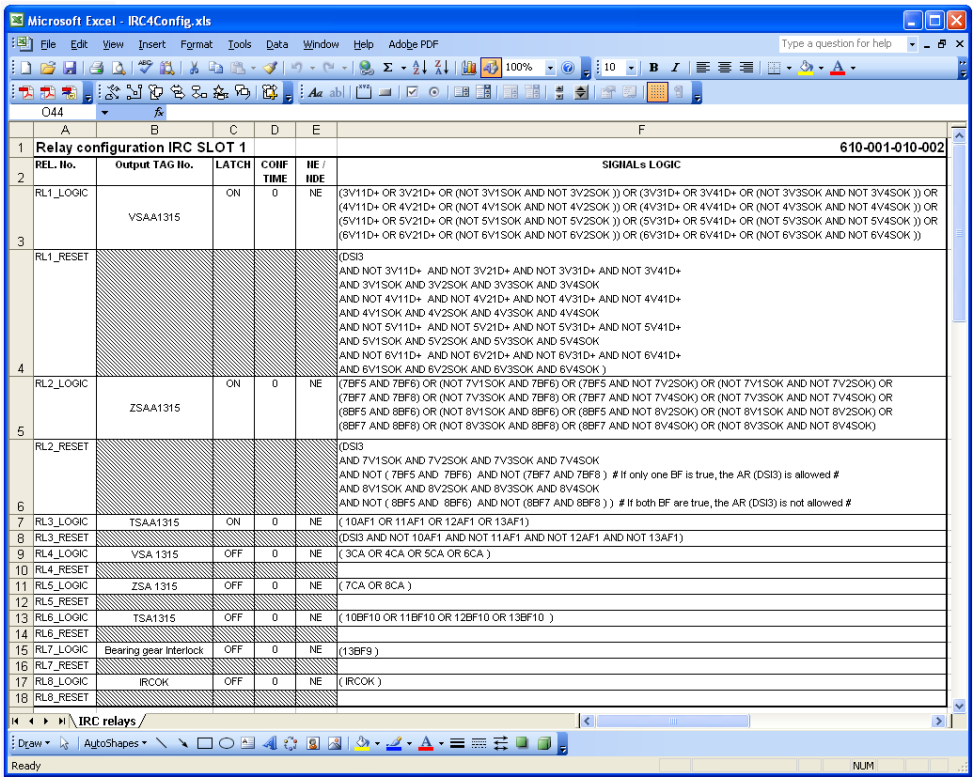
THIS PAGE INTENTIONALLY LEFT BLANK

6 CREATING THE .XLS AND .RCK FILES

6.1 Creating the file containing the logic

6.1.1 Format of the Excel file

The logical equations commanding the relays have to be written into an Excel file obeying certain rules that define fixed positions and reserved words in order to be processed into the IRC4 Configurator. Figure 6-1 shows an example of such Excel file used to import the logic into IRC4 Configurator.



Microsoft Excel - IRC4Config.xls

	A	B	C	D	E	F
1	Relay configuration IRC SLOT 1					610-001-010-002
2	REL. No.	Output TAG No.	LATCH	CONF TIME	NE / NDE	SIGNALs LOGIC
3	RL1_LOGIC	VSAA1315	ON	0	NE	(3V11D+ OR 3V21D+ OR (NOT 3V1SOK AND NOT 3V2SOK)) OR (3V31D+ OR 3V41D+ OR (NOT 3V3SOK AND NOT 3V4SOK)) OR (4V11D+ OR 4V21D+ OR (NOT 4V1SOK AND NOT 4V2SOK)) OR (4V31D+ OR 4V41D+ OR (NOT 4V3SOK AND NOT 4V4SOK)) OR (5V11D+ OR 5V21D+ OR (NOT 5V1SOK AND NOT 5V2SOK)) OR (5V31D+ OR 5V41D+ OR (NOT 5V3SOK AND NOT 5V4SOK)) OR (6V11D+ OR 6V21D+ OR (NOT 6V1SOK AND NOT 6V2SOK)) OR (6V31D+ OR 6V41D+ OR (NOT 6V3SOK AND NOT 6V4SOK))
4	RL1_RESET					(DSI3 AND NOT 3V11D+ AND NOT 3V21D+ AND NOT 3V31D+ AND NOT 3V41D+ AND 3V1SOK AND 3V2SOK AND 3V3SOK AND 3V4SOK AND NOT 4V11D+ AND NOT 4V21D+ AND NOT 4V31D+ AND NOT 4V41D+ AND 4V1SOK AND 4V2SOK AND 4V3SOK AND 4V4SOK AND NOT 5V11D+ AND NOT 5V21D+ AND NOT 5V31D+ AND NOT 5V41D+ AND 5V1SOK AND 5V2SOK AND 5V3SOK AND 5V4SOK AND NOT 6V11D+ AND NOT 6V21D+ AND NOT 6V31D+ AND NOT 6V41D+ AND 6V1SOK AND 6V2SOK AND 6V3SOK AND 6V4SOK)
5	RL2_LOGIC	ZSAA1315	ON	0	NE	(7BF5 AND 7BF6) OR (NOT 7V1SOK AND 7BF6) OR (7BF5 AND NOT 7V2SOK) OR (NOT 7V1SOK AND NOT 7V2SOK) OR (7BF7 AND 7BF8) OR (NOT 7V3SOK AND 7BF8) OR (7BF7 AND NOT 7V4SOK) OR (NOT 7V3SOK AND NOT 7V4SOK) OR (8BF5 AND 8BF6) OR (NOT 8V1SOK AND 8BF6) OR (8BF5 AND NOT 8V2SOK) OR (NOT 8V1SOK AND NOT 8V2SOK) OR (8BF7 AND 8BF8) OR (NOT 8V3SOK AND 8BF8) OR (8BF7 AND NOT 8V4SOK) OR (NOT 8V3SOK AND NOT 8V4SOK)
6	RL2_RESET					(DSI3 AND 7V1SOK AND 7V2SOK AND 7V3SOK AND 7V4SOK AND NOT (7BF5 AND 7BF6) AND NOT (7BF7 AND 7BF8) # If only one BF is true, the AR (DSI3) is allowed # AND 8V1SOK AND 8V2SOK AND 8V3SOK AND 8V4SOK AND NOT (8BF5 AND 8BF6) AND NOT (8BF7 AND 8BF8)) # If both BF are true, the AR (DSI3) is not allowed #
7	RL3_LOGIC	TSAA1315	ON	0	NE	(10AF1 OR 11AF1 OR 12AF1 OR 13AF1)
8	RL3_RESET					(DSI3 AND NOT 10AF1 AND NOT 11AF1 AND NOT 12AF1 AND NOT 13AF1)
9	RL4_LOGIC	VSA 1315	OFF	0	NE	(3CA OR 4CA OR 5CA OR 6CA)
10	RL4_RESET					
11	RL5_LOGIC	ZSA 1315	OFF	0	NE	(7CA OR 8CA)
12	RL5_RESET					
13	RL6_LOGIC	TSA1315	OFF	0	NE	(10BF10 OR 11BF10 OR 12BF10 OR 13BF10)
14	RL6_RESET					
15	RL7_LOGIC	Bearing gear Interlock	OFF	0	NE	(13BF9)
16	RL7_RESET					
17	RL8_LOGIC	IRCOK	OFF	0	NE	(IRCOK)
18	RL8_RESET					

IRC relays

Ready

Figure 6-1 : Example of Excel file containing the logic

The following rules must be respected when creating the .xls file.

- The sheet must be named **IRC relays**.
- Cell A1 contains the slot number, it must be defined as **Relay configuration IRC SLOT x**, where x must be replaced by the actual slot number of the IRC 4.
- Cells A3 to A18 contain the name of the logic (see Figure 6-1). Each relay has one equation that governs the activation of the relay and one governing the reset of the relay. A standard sequence for these logics would be RL1_LOGIC, RL1_RESET, RL2_LOGIC,..., RL8_RESET.
- Cells Bx to Ex, where x is the row of RLx_RESET, should be left blank since their content is not processed.
- Cells Bx, where x is the row of RLx_LOGIC, must contain the tag of the logic. This tag is used as a commentary.
- Cells Cx, where x is the row of RLx_LOGIC, must contain the value of the **LATCH**, namely either **ON** or **OFF**. Note that a blank value equals to **OFF**.

- Cells Dx, where x is the row of RLx_LOGIC, must contain the value of the **CONFTIME**. The value must be set between 0s and 1s by steps of 0.01s. Note that the unit used is the second, decimals must be separated by a dot and every non-numerical character is ignored.
- Cells Ex, where x is the row of RLx_LOGIC must contain the value of inversion state, either **NE** or **NDE.**
- Cells Fx, where x is the row of RLx_LOGIC must contain the logic, refer to Section 6.1.2 for the names and operators allowed.
- Cells Fx, where x is the row of RLx_RESET must contain the logic, refer to Section 6.1.2 for the names and operators allowed.
- Any other cell will not be processed.

6.1.2 Rules for the syntax of the logic

The following rules must be followed when writing the logic equations.

Rule Number	Rule Description
1	Every equation must start with an opening bracket “(“ and end with a closing bracket “)”
2	The number of opening brackets “(“ must equal the number of closing brackets “)”
3	The operators **OR**, **AND** must be preceded by an equation or a symbol and must be followed by an equation, a symbol or a **NOT** operator
4	All symbols used must exist in the MPS rack file (see Chapter 7 - Appendix, Table 7-1)
5	The vote syntax must be: **VOTE(X,(Equation1),(Equation2),...,(EquationN))** with X ≥ N
6	The **NOT** operator must be followed by a symbol or an equation
7	Comments can be inserted between hash symbols “#”

Table 6-1: Syntax rules

6.2 Creating the MPS rack file

NOTE : Please refer to *MPS1 Configuration Software for Machinery Protection System,* Vibro-Meter Document No. MAMPS1-SE/E for more information on how to install and use MPS Software.

The mapping of the buses (either using the OC bus or RAW bus) is done using the MPS software and then importing the .rck file generated into the IRC4 Configurator.

Since the MPS software doesn't support the IRC 4 card yet, the mapping will be done using a "dummy" RLC 16 card instead: in the MPS software, the slots containing an RLC 16 are marked in the Rack Rear Layout zone of the General Information screen at rack level (see Figure 6-2). Since the IRC 4 is considered as an RLC in the MPS, these checkboxes have to be checked for the slots containing an IRC 4.

NOTE : Unlike the RLC 16, the IRC 4 card can only be inserted in the slots 1, 2 and 15 to use the OC Bus.

NOTE : The IRC 4 can be inserted in slots 3 to 14, but in this case, only the Raw Bus is accessible.

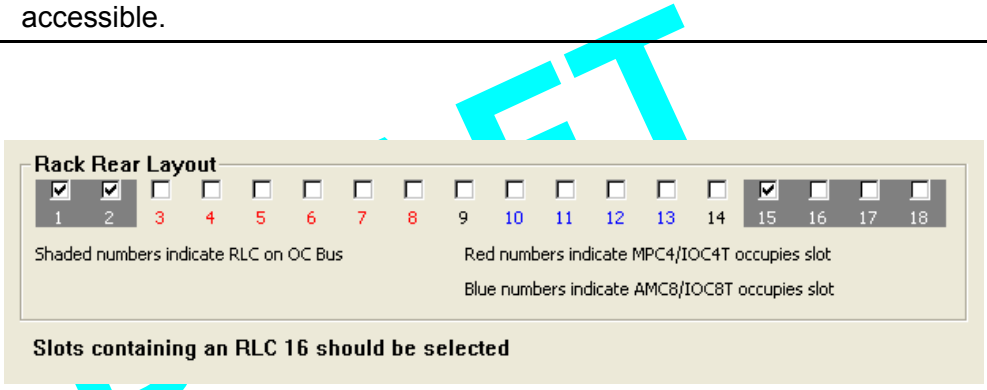


Figure 6-2 : Rack Rear Layout zone of the General Information screen

6.2.1 Using the Raw Bus

Relays on an IRC 4 can be controlled over the Raw Bus, as well as over the OC Bus.

To place a relay control signal on the Raw Bus, proceed as follows:

1- Select the Output Mapping / Discrete outputs branch of the configuration tree, as shown on Figure 6-3.

2- Open the Relay Mapping / RLC / Raw Bus branch of the tree appearing on the right-hand side of the screen.
This branch lists 16 bus lines, identified as #1 to #16.

3- Select a line and be aware that if more than 4 different signals are put on one line at least two of them will be grouped as "ORed" identifiers (see below).

4- Attribute a signal to the line using the combo boxes on the right of the screen. In this example we select:
Channel: Measurement Channel 1,
Output: Measurement,
Status: Danger + High

5- Click the **Apply** button.

6- Click on the **save** icon to save what you have done so far.

To configure the relay control signal, proceed as follows

1- Select the rack in the main configuration tree, as shown in Figure 6-4.

2- Select the Backplane Configuration tab and open up the Discrete Information / Raw Bus branch of the tree.

3- Select the line corresponding to the relay control signal. These signals are identified by a code such as “V11D+”.
Refer to Table 7-1 for the definition of all codes that can be found on this screen.

4- Select the target IRC 4 card from the **RLC Destination Slots** combo box.

NOTE 1 : This parameter is for information only, it won’t be treated by the IRC 4 configurator.

5- Select a bus line from **Discrete Info Attribution Line** combo box.

NOTE 2 : If two or more identifiers use the same **Discrete Info Attribution Line**, this will be translated as an “ORed” identifier (see Figure 6-10).

6- The desired polarity from **Relay Polarity** can be set for information purpose only, because this parameter won’t be taken into account by the IRC 4 configurator. The relay polarity must be set in the Excel file, see Section 6.1.1.

7- Click **Apply** button.

8- Click on the **save** icon to apply the changes to the .rck file.

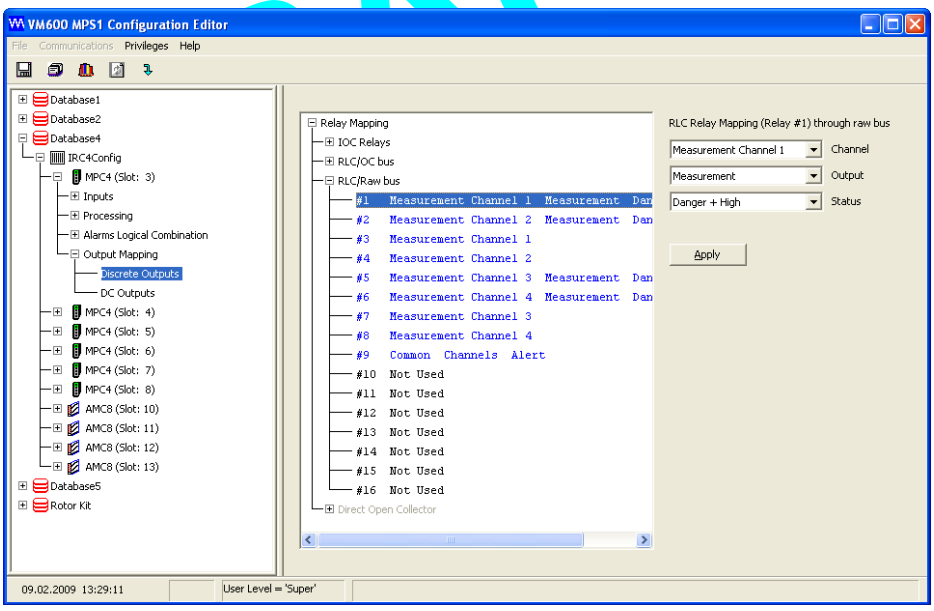


Figure 6-3 : Attributing the alarm signal “Measurement channel 1, measurement, Danger+ High” to line 1 on the Raw Bus.

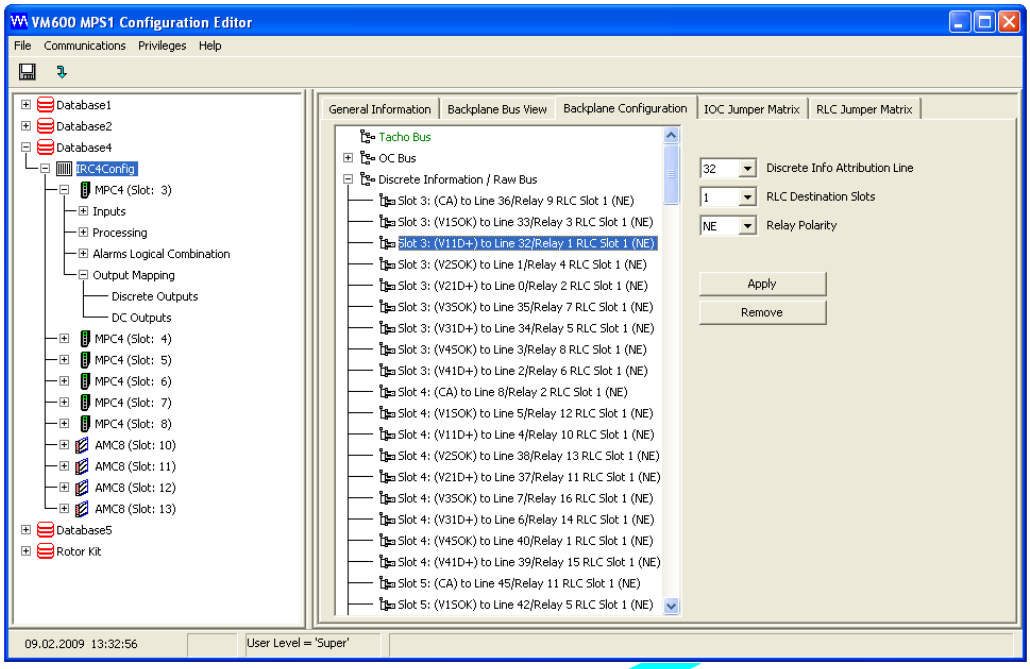


Figure 6-4 : Typical configuration on the Backplane Configuration screen

6.2.2 Using the OC bus

The mapping can be made using either the RAW bus or the OC bus, but in the latter case the card can't be plugged in any slot, it has to be placed according to Figure 6-5.

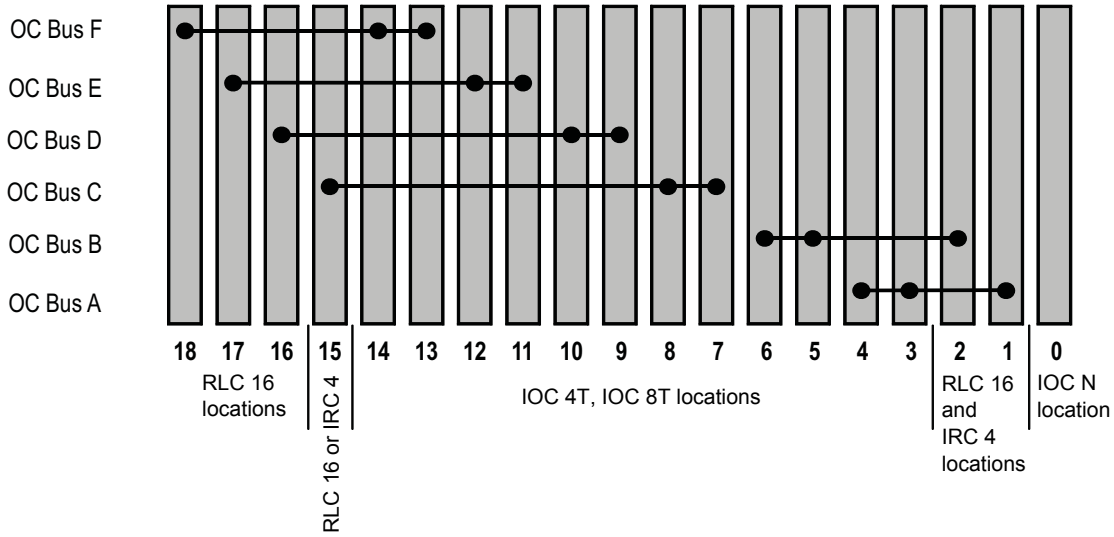


Figure 6-5 : Rear view of rack showing the six dedicated OC Buses

Signals can be put on the OC Bus by selecting the Output Mapping / Discrete Outputs branch of the configuration tree in the MPS software, as shown in Figure 6-6.

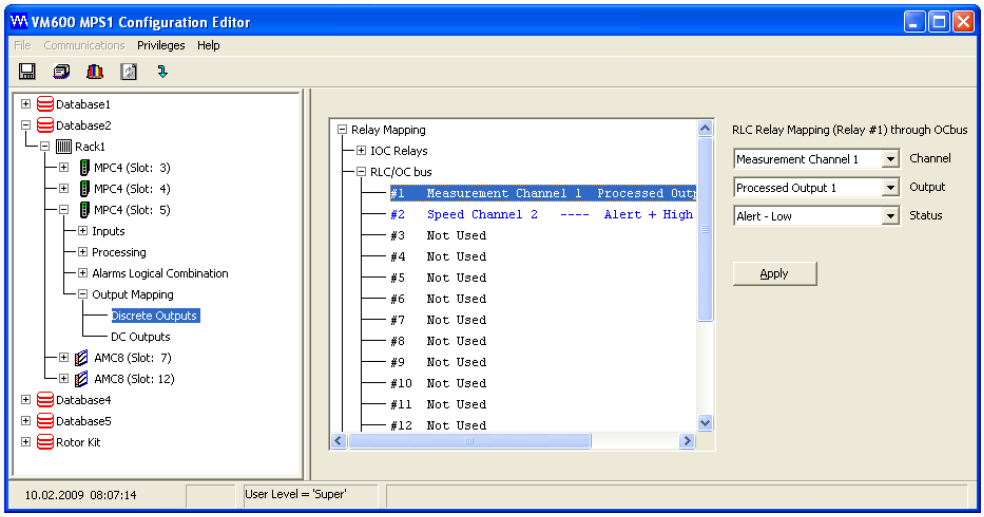


Figure 6-6 : Attributing the alarm signal “Measurement channel 1, Processed Output 1, Alert- Low” to the line 1 on the OC Bus

The software automatically selects the appropriate OC Bus among the six that exist (OC Bus A to OC Bus F). For example, in Figure 6-7, OC Bus B is selected because the signal originates on the card pair in slot 5. This links slot 5 to the IRC 4 card in slot 2 (see Figure 6-5).

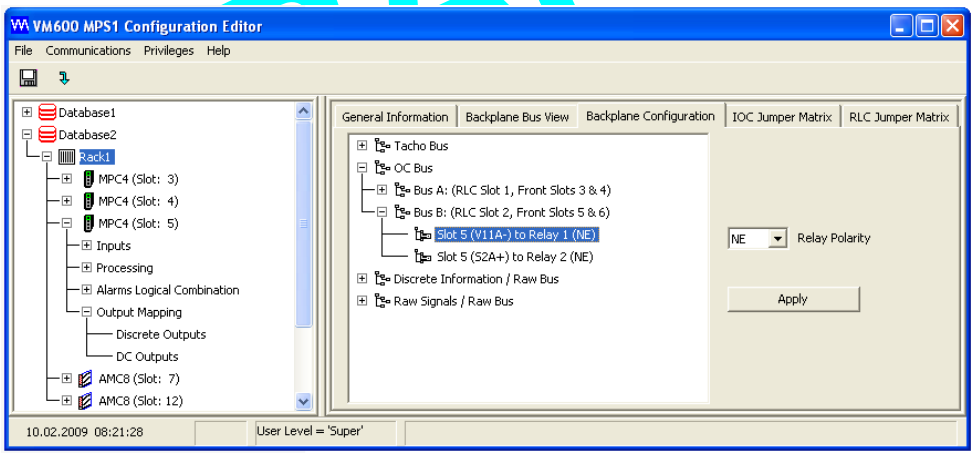


Figure 6-7 : Backplane Configuration tab

The Backplane Bus View allows you to see which of the 16 OC Bus lines are free. These are indicated in green.

Choose a free OC Bus line for the signal.

Figure 6-6 shows how to attribute the alarm signal “Measurement Channel 1, Processed Output 1, Alert- Low” to line 1.

Figure 6-7 shows the Backplane Configuration tab that allows to set the polarity of the relay, however this setting is not taken into account in the IRC 4 Configurator, the polarity has to be set in the Excel file, as explained in Section 6.1.1.

As well as in the General Information tab, it can be seen that Relay 1 is controlled by the signal having the code “V11A-” in this example.
Refer to Table 7-1 for the definition of all codes that can be found on this screen.

When the configuration is finished, click on the **save** icon to update the .rck file.

6.2.3 Retrieving the .rck file

Once the mapping of the signals on the Raw or OC bus using MPS software is done, the configuration file can be used in the IRC 4 Configurator, as described in Section 4.2.

The .rck file is located in the MPS application folder, by default, it should be at the following path:

`C:\Program Files\VM600_MPS\Configuration\`**`DatabaseName.db\IRC4Config.rck`**

Where

- **`DatabaseName`** is the name of your database (Tag) in MPS software,
- **`IRC4Config`** is the name of your rack (Tag) in MPS software.

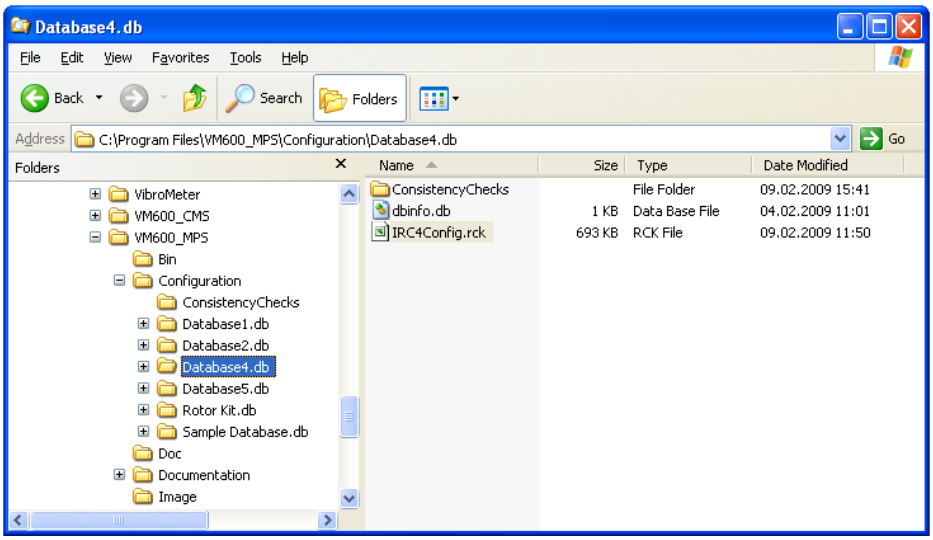


Figure 6-8 : Folder containing the .rck file

6.3 MPS - backplane configuration extractor

Once the rack is completely defined with MPS, a tool can be used to extract the mapping of the Discrete Outputs of the rack. This may help to have a complete list of identifiers available.

To use the tool, first copy in your working directory the `DisplayRaw.exe` program found in the IRC 4 Configurator installation CD, then copy the `.rck` file in the same folder.

Go to **Start > All Programs > Accessories > Command Prompt**

Then type the following commands (see Figure 6-9):

```
C:\>M:
M:\>cd IRC4
M:\IRC4>DisplayRaw.exe IRC4Config.rck > out.txt
```

Where `IRC4` is the directory on the drive M containing the `IRC4Config.rck`, the MPS rack file and `out.txt` is the resulting text file containing the mapping.

Figure 6-10 shows an example of output file with a description of its fields.

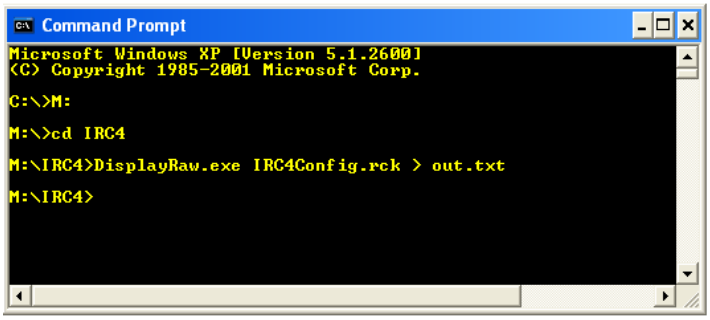


Figure 6-9 : Command Prompt

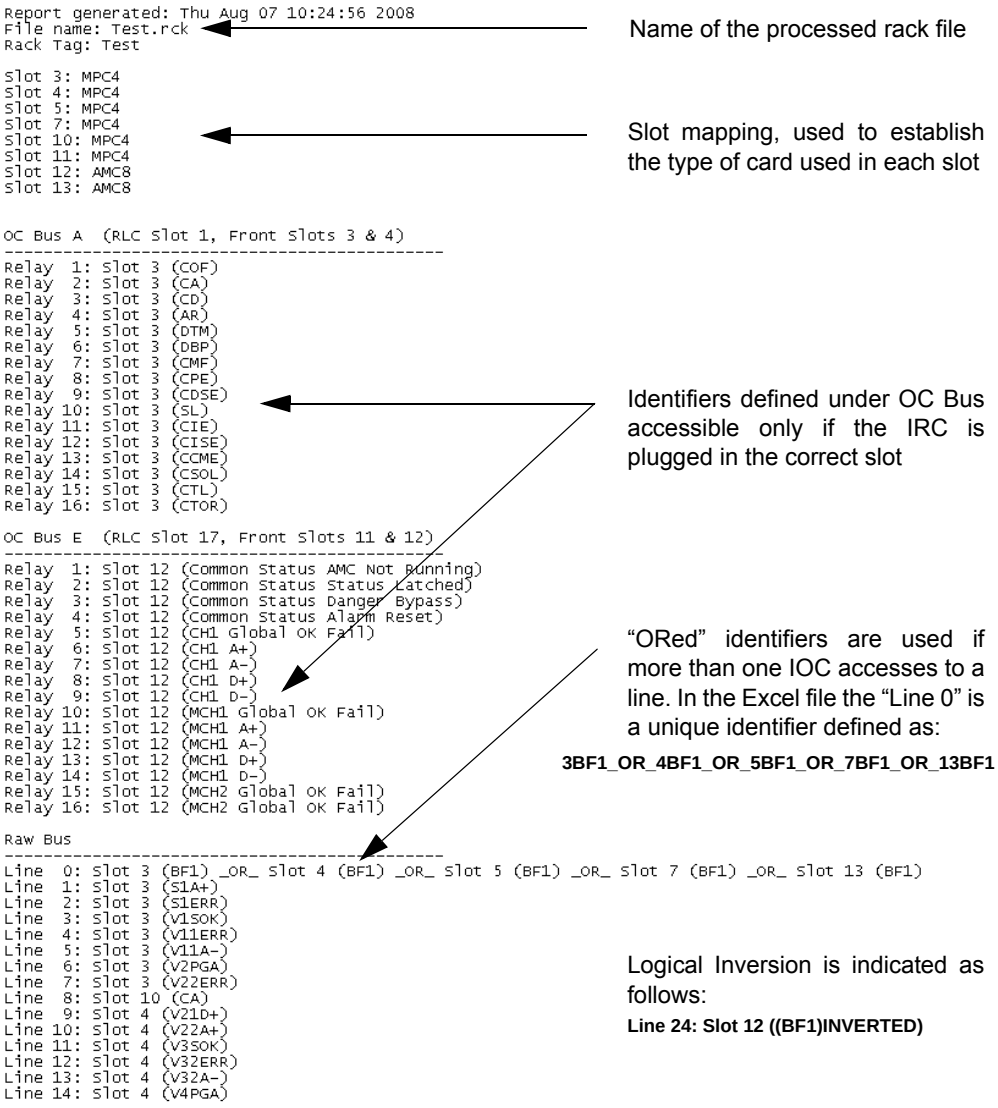


Figure 6-10 : Format of the output text file

7 APPENDIX

7.1 Reserved words

		Reserved word (n is the slot number from 3 to 14)	MPS Backplane Configuration Extractor tools syntax	Logical Inv.	Normal State	Function, as described in the MPS software
MPC	Common	nMCR	Slot n (MCR)	0	1	Common MPC Diagnostics MPC Card Running
		nCMF	Slot n (CMF)	0	0	Common MPC Diagnostics Monitoring Failure
		nCOF	Slot n (COF)	0	0	Common Channels Sensor OK Failure
		nCPE	Slot n (CPE)	0	0	Common MPC Diagnostics Processing Error
		nCIE	Slot n (CIE)	0	0	Common Signal Diagnostics Input Signal Error
		nCA	Slot n (CA)	0	0	Common Channels Alarm
		nCD	Slot n (CD)	0	0	Common Channels Danger
		nCSOL	Slot n (CSOL)	0	0	Common Trk/Spd Diagnostics Speed Out Of Limit
		nCTL	Slot n (CTL)	0	0	Common Trk/Spd Diagnostics Track Lost
		nCTOR	Slot n (CTOR)	0	0	Common Trk/Spd Diagnostics Track Out Of Range
		nCDSE	Slot n (CDSE)	0	0	Common MPC Diagnostics DSP Saturation Error
		nCISE	Slot n (CISE)	0	0	Common Signal Diagnostics Input Saturation Error
		nCCME	Slot n (CCME)	0	0	Common Signal Diagnostics Common Mode Overflow
		nSL	Slot n (SL)	0	0	Common MPC Diagnostics Status Latch/Err.
		nDTM	Slot n (DTM)	0	0	Common Controls Direct Trip Multiply
		nDBP	Slot n (DBP)	0	0	Common Controls Danger Bypass
		nAR	Slot n (AR)	0	0	Common Controls Alarm Reset
MPC	Speed channels	nS1A+	Slot n (S1A+)	0	0	Speed Channel 1 Alarm + High
		nS1A-	Slot n (nS1A-)	0	0	Speed Channel 1 Alarm – Low
		nS1ERR	Slot n (nS1ERR)	0	0	Speed Channel 1 Invalid
		nS1SOK	Slot n (nS1SOK)	0	1	Speed Channel 1 Sensor OK check successful (SOK Level)
		nS2A+	Slot n (nS2A+)	0	0	Speed Channel 2 Alarm + High
		nS2A-	Slot n (nS2A-)	0	0	Speed Channel 2 Alarm - Low
		nS2ERR	Slot n (nS2ERR)	0	0	Speed Channel 2 Invalid
		nS2SOK	Slot n (nS2SOK)	0	1	Speed Channel 2 Sensor OK check successful (SOK Level)
MPC	Measurement Channel 1	nV11A+	Slot n (V11A+)	0	0	Measurement Channel 1 Process Output 1 A+
		nV11A-	Slot n (V11A-)	0	0	Measurement Channel 1 Process Output 1 A-
		nV11D+	Slot n (V11D+)	0	0	Measurement Channel 1 Process Output 1 D+
		nV11D-	Slot n (V11D-)	0	0	Measurement Channel 1 Process Output 1 D-
		nV11ERR	Slot n (V11ERR)	0	0	Measurement Channel 1 Process Output 1 Error bit
		nV12A+	Slot n (V12A+)	0	0	Measurement Channel 1 Process Output 2 A+
		nV12A-	Slot n (V12A-)	0	0	Measurement Channel 1 Process Output 2 A-
		nV12D+	Slot n (V12D+)	0	0	Measurement Channel 1 Process Output 2 D+
		nV12D-	Slot n (V12D-)	0	0	Measurement Channel 1 Process Output 2 D-
		nV12ERR	Slot n (V12ERR)	0	0	Measurement Channel 1 Process Output 2 Error bit
		nV1PGA	Slot n (V1PGA)	0	0	Measurement Channel 1 PGA Saturation Error
		nV1SOK	Slot n (V1SOK)	0	1	Measurement Channel 1 Sensor OK check successful

Table 7-1 : Reserved words (n defines the VME slot number (3 to 14)) (Part 1 of 6)

		Reserved word (n is the slot number from 3 to 14)	MPS Backplane Configuration Extractor tools syntax	Logical Inv.	Normal State	Function, as described in the MPS software
MPC	Measurement Channel 2	nV21A+	Slot n (V21A+)	0	0	Measurement Channel 2 Process Output 1 A+
		nV21A-	Slot n (V21A-)	0	0	Measurement Channel 2 Process Output 1 A-
		nV21D+	Slot n (V21D+)	0	0	Measurement Channel 2 Process Output 1 D+
		nV21D-	Slot n (V21D-)	0	0	Measurement Channel 2 Process Output 1 D-
		nV21ERR	Slot n (V21ERR)	0	0	Measurement Channel 2 Process Output 1 Error bit
		nV22A+	Slot n (V22A+)	0	0	Measurement Channel 2 Process Output 2 A+
		nV22A-	Slot n (V22A-)	0	0	Measurement Channel 2 Process Output 2 A-
		nV22D+	Slot n (V22D+)	0	0	Measurement Channel 2 Process Output 2 D+
		nV22D-	Slot n (V22D-)	0	0	Measurement Channel 2 Process Output 2 D-
		nV22ERR	Slot n (V22ERR)	0	0	Measurement Channel 2 Process Output 2 Error bit
		nV2PGA	Slot n (V2PGA)	0	0	Measurement Channel 2 PGA Saturation Error
		nV2SOK	Slot n (V2SOK)	0	1	Measurement Channel 2 Sensor OK check successful
MPC	Measurement Channel 3	nV31A+	Slot n (V31A+)	0	0	Measurement Channel 3 Process Output 1 A+
		nV31A-	Slot n (V31A-)	0	0	Measurement Channel 3 Process Output 1 A-
		nV31D+	Slot n (V31D+)	0	0	Measurement Channel 3 Process Output 1 D+
		nV31D-	Slot n (V31D-)	0	0	Measurement Channel 3 Process Output 1 D-
		nV31ERR	Slot n (V31ERR)	0	0	Measurement Channel 3 Process Output 1 Error bit
		nV32A+	Slot n (V32A+)	0	0	Measurement Channel 3 Process Output 2 A+
		nV32A-	Slot n (V32A-)	0	0	Measurement Channel 3 Process Output 2 A-
		nV32D+	Slot n (V32D+)	0	0	Measurement Channel 3 Process Output 2 D+
		nV32D-	Slot n (V32D-)	0	0	Measurement Channel 3 Process Output 2 D-
		nV32ERR	Slot n (V32ERR)	0	0	Measurement Channel 3 Process Output 2 Error bit
		nV3PGA	Slot n (V3PGA)	0	0	Measurement Channel 3 PGA Saturation Error
		nV3SOK	Slot n (V3SOK)	0	1	Measurement Channel 3 Sensor OK check successful
MPC	Measurement Channel 4	nV41A+	Slot n (V41A+)	0	0	Measurement Channel 4 Process Output 1 A+
		nV41A-	Slot n (V41A-)	0	0	Measurement Channel 4 Process Output 1 A-
		nV41D+	Slot n (V41D+)	0	0	Measurement Channel 4 Process Output 1 D+
		nV41D-	Slot n (V41D-)	0	0	Measurement Channel 4 Process Output 1 D-
		nV41ERR	Slot n (V41ERR)	0	0	Measurement Channel 4 Process Output 1 Error bit
		nV42A+	Slot n (V42A+)	0	0	Measurement Channel 4 Process Output 2 A+
		nV42A-	Slot n (V42A-)	0	0	Measurement Channel 4 Process Output 2 A-
		nV42D+	Slot n (V42D+)	0	0	Measurement Channel 4 Process Output 2 D+
		nV42D-	Slot n (V42D-)	0	0	Measurement Channel 4 Process Output 2 D-
		nV42ERR	Slot n (V42ERR)	0	0	Measurement Channel 4 Process Output 2 Error bit
		nV4PGA	Slot n (V4PGA)	0	0	Measurement Channel 4 PGA Saturation Error
		nV4SOK	Slot n (V4SOK)	0	1	Measurement Channel 4 Sensor OK check successful
MPC	Measurement Channel 1 & 2	nD12A+	Slot n (D12A+)	0	0	Measurement Channel 1 & 2 Process Output 1 A+
		nD12A-	Slot n (D12A-)	0	0	Measurement Channel 1 & 2 Process Output 1 A-
		nD12D+	Slot n (D12D+)	0	0	Measurement Channel 1 & 2 Process Output 1 D+
		nD12D-	Slot n (D12D-)	0	0	Measurement Channel 1 & 2 Process Output 1 D-
		nD12ERR	Slot n (D12ERR)	0	0	Measurement Channel 1 & 2 Process Output Error bit
		nD12PGA	Slot n (D12PGA)	0	0	Measurement Channel 1 & 2 PGA Saturation Error
		nD12SOK	Slot n (D12SOK)	0	1	Measurement Channel 1 & 2 Sensor OK check successful

Table 7-1 : Reserved words (n defines the VME slot number (3 to 14)) (Part 2 of 6)

		Reserved word (n is the slot number from 3 to 14)	MPS Backplane Configuration Extractor tools syntax	Logical Inv.	Normal State	Function, as described in the MPS software
MPC	Measurement Channel 3 & 4	nD34A+	Slot n (D34A+)	0	0	Measurement Channel 3 & 4 Process Output 1 A+
		nD34A-	Slot n (D34A-)	0	0	Measurement Channel 3 & 4 Process Output 1 A-
		nD34D+	Slot n (D34D+)	0	0	Measurement Channel 3 & 4 Process Output 1 D+
		nD34D-	Slot n (D34D-)	0	0	Measurement Channel 3 & 4 Process Output 1 D-
		nD34ERR	Slot n (D34ERR)	0	0	Measurement Channel 3 & 4 Process Output Error bit
		nD34PGA	Slot n (D34PGA)	0	0	Measurement Channel 3 & 4 PGA Saturation Error
		nD34SOK	Slot n (D34SOK)	0	1	Measurement Channel 3 & 4 Sensor OK check successful
MPC	Basic & Advanced Functions	nBF1	Slot n (BF1)	0	0	Combination Basic 1
		nBF2	Slot n (BF2)	0	0	Combination Basic 2
		nBF3	Slot n (BF3)	0	0	Combination Basic 3
		nBF4	Slot n (BF4)	0	0	Combination Basic 4
		nBF5	Slot n (BF5)	0	0	Combination Basic 5
		nBF6	Slot n (BF6)	0	0	Combination Basic 6
		nBF7	Slot n (BF7)	0	0	Combination Basic 7
		nBF8	Slot n (BF8)	0	0	Combination Basic 8
		nAF1	Slot n (AF1)	0	0	Combination Advanced 1
		nAF2	Slot n (AF2)	0	0	Combination Advanced 2
		nAF3	Slot n (AF3)	0	0	Combination Advanced 3
		nAF4	Slot n (AF4)	0	0	Combination Advanced 4
MPC	Basic & Advanced Functions	RLY1A	-	0	0	RLY1 is in Alarm state (RLY1 LED is red)
		RLY1ERR	-	0	0	RLY1 is in Error state (RLY1 LED is Yellow blinking)
		RLY2A	-	0	0	RLY2 is in Alarm state (RLY2 LED is red)
		RLY2ERR	-	0	0	RLY2 is in Error state (RLY2 LED is Yellow blinking)
		RLY3A	-	0	0	RLY3 is in Alarm state (RLY3 LED is red)
		RLY3ERR	-	0	0	RLY3 is in Error state (RLY3 LED is Yellow blinking)
		RLY4A	-	0	0	RLY4 is in Alarm state (RLY4 LED is red)
		RLY4ERR	-	0	0	RLY4 is in Error state (RLY4 LED is Yellow blinking)
		RLY5A	-	0	0	RLY5 is in Alarm state (RLY5 LED is red)
		RLY5ERR	-	0	0	RLY5 is in Error state (RLY5 LED is Yellow blinking)
		RLY6A	-	0	0	RLY6 is in Alarm state (RLY6 LED is red)
		RLY6ERR	-	0	0	RLY6 is in Error state (RLY6 LED is Yellow blinking)
		RLY7A	-	0	0	RLY7 is in Alarm state (RLY7 LED is red)
		RLY7ERR	-	0	0	RLY7 is in Error state (RLY7 LED is Yellow blinking)
		RLY8A	-	0	0	RLY8 is in Alarm state (RLY8 LED is red)
		RLY8ERR	-	0	0	RLY8 is in Error state (RLY8 LED is Yellow blinking)
		DSI1	-	0	0	Discrete Input #1 (‘0’=Open, ‘1’=Short to GND)
		DSI2	-	0	0	Discrete Input #2 (‘0’=Open, ‘1’=Short to GND)
		DSI3	-	0	0	Discrete Input #3 (‘0’=Open, ‘1’=Short to GND)
		DSI4	-	0	0	Discrete Input #4 (‘0’=Open, ‘1’=Short to GND)
		AR	-	0	0	Alarm Reset (‘0’=Open, ‘1’=Short to GND)
		DB	-	0	0	Danger Bypass (‘0’=Open, ‘1’=Short to GND)
		IRCOK	-	0	0	IRC4 Common OK

Table 7-1 : Reserved words (n defines the VME slot number (3 to 14)) (Part 3 of 6)

		Reserved word (n is the slot number from 3 to 14)	MPS Backplane Configuration Extractor tools syntax	Logical Inv.	Normal State	Function, as described in the MPS software
AMC	Input Channel 1	nCH1A+	Slot n (CH1 A+)	0	0	Input Channel 1 Alarm+
		nCH1A-	Slot n (CH1 A-)	0	0	Input Channel 1 Alarm-
		nCH1D+	Slot n (CH1 D+)	0	0	Input Channel 1 Danger+
		nCH1D-	Slot n (CH1 D-)	0	0	Input Channel 1 Danger-
		nCH1GOKF	Slot n (CH1 Global OK Fail)	0	0	Input Channel 1 Global Channel OK Fail
AMC	Input Channel 2	nCH2A+	Slot n (CH2 A+)	0	0	Input Channel 2 Alarm+
		nCH2A-	Slot n (CH2 A-)	0	0	Input Channel 2 Alarm-
		nCH2D+	Slot n (CH2 D+)	0	0	Input Channel 2 Danger+
		nCH2D-	Slot n (CH2 D-)	0	0	Input Channel 2 Danger-
		nCH2GOKF	Slot n (CH2 Global OK Fail)	0	0	Input Channel 2 Global Channel OK Fail
AMC	Input Channel 3	nCH3A+	Slot n (CH3 A+)	0	0	Input Channel 3 Alarm+
		nCH3A-	Slot n (CH3 A-)	0	0	Input Channel 3 Alarm-
		nCH3D+	Slot n (CH3 D+)	0	0	Input Channel 3 Danger+
		nCH3D-	Slot n (CH3 D-)	0	0	Input Channel 3 Danger-
		nCH3GOKF	Slot n (CH3 Global OK Fail)	0	0	Input Channel 3 Global Channel OK Fail
AMC	Input Channel 4	nCH4A+	Slot n (CH4 A+)	0	0	Input Channel 4 Alarm+
		nCH4A-	Slot n (CH4 A-)	0	0	Input Channel 4 Alarm-
		nCH4D+	Slot n (CH4 D+)	0	0	Input Channel 4 Danger+
		nCH4D-	Slot n (CH4 D-)	0	0	Input Channel 4 Danger-
		nCH4GOKF	Slot n (CH4 Global OK Fail)	0	0	Input Channel 4 Global Channel OK Fail
AMC	Input Channel 5	nCH5A+	Slot n (CH5 A+)	0	0	Input Channel 5 Alarm+
		nCH5A-	Slot n (CH5 A-)	0	0	Input Channel 5 Alarm-
		nCH5D+	Slot n (CH5 D+)	0	0	Input Channel 5 Danger+
		nCH5D-	Slot n (CH5 D-)	0	0	Input Channel 5 Danger-
		nCH5GOKF	Slot n (CH5 Global OK Fail)	0	0	Input Channel 5 Global Channel OK Fail
AMC	Input Channel 6	nCH6A+	Slot n (CH2 A+)	0	0	Input Channel 2 Alarm+
		nCH6A-	Slot n (CH2 A-)	0	0	Input Channel 2 Alarm-
		nCH6D+	Slot n (CH2 D+)	0	0	Input Channel 2 Danger+
		nCH6D-	Slot n (CH2 D-)	0	0	Input Channel 2 Danger-
		nCH6GOKF	Slot n (CH2 Global OK Fail)	0	0	Input Channel 2 Global Channel OK Fail
AMC	Input Channel 7	nCH7A+	Slot n (CH7 A+)	0	0	Input Channel 7 Alarm+
		nCH7A-	Slot n (CH7 A-)	0	0	Input Channel 7 Alarm-
		nCH7D+	Slot n (CH7 D+)	0	0	Input Channel 7 Danger+
		nCH7D-	Slot n (CH7 D-)	0	0	Input Channel 7 Danger-
		nCH7GOKF	Slot n (CH7 Global OK Fail)	0	0	Input Channel 7 Global Channel OK Fail
AMC	Input Channel 8	nCH8A+	Slot n (CH8 A+)	0	0	Input Channel 8 Alarm+
		nCH8A-	Slot n (CH8 A-)	0	0	Input Channel 8 Alarm-
		nCH8D+	Slot n (CH8 D+)	0	0	Input Channel 8 Danger+
		nCH8D-	Slot n (CH8 D-)	0	0	Input Channel 8 Danger-
		nCH8GOKF	Slot n (CH8 Global OK Fail)	0	0	Input Channel 8 Global Channel OK Fail

Table 7-1 : Reserved words (n defines the VME slot number (3 to 14)) (Part 4 of 6)

		Reserved word (n is the slot number from 3 to 14)	MPS Backplane Configuration Extractor tools syntax	Logical Inv.	Normal State	Function, as described in the MPS software
AMC	Input Channel 1	nAF1	Slot n (AF1)	0 / 1	0 / 1	Advanced Logic Combination Function 1
		nAF2	Slot n (AF2)	0 / 1	0 / 1	Advanced Logic Combination Function 2
		nAF3	Slot n (AF3)	0 / 1	0 / 1	Advanced Logic Combination Function 3
		nAF4	Slot n (AF4)	0 / 1	0 / 1	Advanced Logic Combination Function 4
		nAF5	Slot n (AF5)	0 / 1	0 / 1	Advanced Logic Combination Function 5
		nAF6	Slot n (AF6)	0 / 1	0 / 1	Advanced Logic Combination Function 6
		nAF7	Slot n (AF7)	0 / 1	0 / 1	Advanced Logic Combination Function 7
		nAF8	Slot n (AF8)	0 / 1	0 / 1	Advanced Logic Combination Function 8
AMC	Common	nCSANR	Slot n (Common Status AMC Not Running)	0	0	Common Status AMC Not Running
		nCSSL	Slot n (Common Status Status Latched)	0	0	Common Status Status latched
		nCSDB	Slot n (Common Status Danger Bypass)	0	0	Common Status Danger Bypass
		nCSAR	Slot n (Common Status Alarm Reset)	0	0	Common Status Alarm Reset
AMC	Input Channel 1	nMCH1A+	Slot n (MCH1 A+)	0	0	Multi Channel 1 Alarm+
		nMCH1A-	Slot n (MCH1 A-)	0	0	Multi Channel 1 Alarm-
		nMCH1D+	Slot n (MCH1 D+)	0	0	Multi Channel 1 Danger+
		nMCH1D-	Slot n (MCH1 D-)	0	0	Multi Channel 1 Danger-
		nMCH1GOKF	Slot n (MCH1 Global OK Fail)	0	0	Multi Channel 1 Global Channel OK Fail
AMC	Input Channel 2	nMCH2A+	Slot n (MCH2 A+)	0	0	Multi Channel 2 Alarm+
		nMCH2A-	Slot n (MCH2 A-)	0	0	Multi Channel 2 Alarm-
		nMCH2D+	Slot n (MCH2 D+)	0	0	Multi Channel 2 Danger+
		nMCH2D-	Slot n (MCH2 D-)	0	0	Multi Channel 2 Danger-
		nMCH2GOKF	Slot n (MCH2 Global OK Fail)	0	0	Multi Channel 2 Global Channel OK Fail
AMC	Input Channel 3	nMCH3A+	Slot n (MCH3 A+)	0	0	Multi Channel 3 Alarm+
		nMCH3A-	Slot n (MCH3 A-)	0	0	Multi Channel 3 Alarm-
		nMCH3D+	Slot n (MCH3 D+)	0	0	Multi Channel 3 Danger+
		nMCH3D-	Slot n (MCH3 D-)	0	0	Multi Channel 3 Danger-
		nMCH3GOKF	Slot n (MCH3 Global OK Fail)	0	0	Multi Channel 3 Global Channel OK Fail
AMC	Input Channel 4	nMCH4A+	Slot n (MCH4 A+)	0	0	Multi Channel 4 Alarm+
		nMCH4A-	Slot n (MCH4 A-)	0	0	Multi Channel 4 Alarm-
		nMCH4D+	Slot n (MCH4 D+)	0	0	Multi Channel 4 Danger+
		nMCH4D-	Slot n (MCH4 D-)	0	0	Multi Channel 4 Danger-
		nMCH4GOKF	Slot n (MCH4 Global OK Fail)	0	0	Multi Channel 4 Global Channel OK Fail

Table 7-1 : Reserved words (n defines the VME slot number (3 to 14)) (Part 5 of 6)

		Reserved word (n is the slot number from 3 to 14)	MPS Backplane Configuration Extractor tools syntax	Logical Inv.	Normal State	Function, as described in the MPS software
AMC	Basic Logical Combination Function	nBF1	Slot n (BF1)	0 / 1	0 / 1	Basic Logic Combination Function 1
		nBF2	Slot n (BF2)	0 / 1	0 / 1	Basic Logic Combination Function 2
		nBF3	Slot n (BF3)	0 / 1	0 / 1	Basic Logic Combination Function 3
		nBF4	Slot n (BF4)	0 / 1	0 / 1	Basic Logic Combination Function 4
		nBF5	Slot n (BF5)	0 / 1	0 / 1	Basic Logic Combination Function 5
		nBF6	Slot n (BF6)	0 / 1	0 / 1	Basic Logic Combination Function 6
		nBF7	Slot n (BF7)	0 / 1	0 / 1	Basic Logic Combination Function 7
		nBF8	Slot n (BF8)	0 / 1	0 / 1	Basic Logic Combination Function 8
		nBF9	Slot n (BF9)	0 / 1	0 / 1	Basic Logic Combination Function 9
		nBF10	Slot n (BF10)	0 / 1	0 / 1	Basic Logic Combination Function 10
		nBF11	Slot n (BF11)	0 / 1	0 / 1	Basic Logic Combination Function 11
		nBF12	Slot n (BF12)	0 / 1	0 / 1	Basic Logic Combination Function 12
		nBF13	Slot n (BF13)	0 / 1	0 / 1	Basic Logic Combination Function 13
		nBF14	Slot n (BF14)	0 / 1	0 / 1	Basic Logic Combination Function 14
		nBF15	Slot n (BF15)	0 / 1	0 / 1	Basic Logic Combination Function 15
		nBF16	Slot n (BF16)	0 / 1	0 / 1	Basic Logic Combination Function 16

Table 7-1 : Reserved words (n defines the VME slot number (3 to 14)) (Part 6 of 6)

8 CUSTOMER SUPPORT

8.1 Contacting us

Vibro-Meter's worldwide customer support network offers a range of support including 8.2- Technical support and 8.3- Sales and repairs support. For customer support, please contact your local Vibro-Meter representative. Alternatively, contact our main office:

Customer support
Vibro-Meter SA
Route de Moncor 4
PO Box 1616
CH-1701 Fribourg
Switzerland

Tel.: +41 (0)26 407 11 11
e-mail: energysupport@ch.meggitt.com
web: www.vibro-meter.com

8.2 Technical support

Vibro-meter's technical support team provide both pre-sales and post-sales technical support, including:

1- General advice

2- Technical advice

3- Troubleshooting

4- Site visits

NOTE : For further information, please contact Vibro-Meter (see 8.1- Contacting us).

8.3 Sales and repairs support

Vibro-Meter's sales team provide both pre-sales and post-sales support, including advice on:

1- New products

2- Spare parts

3- Repairs

NOTE : If a product has to be returned to Vibro-Meter for repairs, then it should be accompanied by a completed Failure report form on page 8-3.

8.4 Customer feedback

As part of our continuing commitment to improving customer service, we warmly welcome your opinions. To provide feedback, please complete the Customer feedback form on page 8-5 and return it Vibro-Meter's main office (see 8.1- Contacting us).

THIS PAGE INTENTIONALLY LEFT BLANK

FAILURE REPORT FORM

If the product has to be returned to Vibro-Meter for repairs, then:

1- Complete this failure report form

2- Attach a photocopy of this report to the faulty unit and retain the original copy for your records

3- Send the product together with the attached failure report form to Vibro-Meter by registered post

NOTE : Please provide as much information as possible in order to assist fault diagnosis.

NOTE : A failure report MUST be sent with each faulty product.

Contact details:

Name _____ Job title _____

Company _____ Email _____

Address _____

Country _____ Post code _____

Telephone _____ Fax _____

Signature _____ Date _____

Product details:

Product type: _____

Serial number (S/N): _____ Part number (P/N): _____

Vibro-Meter order number: _____

Date of purchase: _____ Site where installed: _____

Is the failure (put an ☒ where appropriate):

☐ Continuous ? ☐ Intermittent ? ☐ Temperature dependent?

Description of failure:

_____

_____

_____

_____

_____

(Please continue overleaf)

(Continued)

(Please continue on a separate sheet if necessary)

CUSTOMER FEEDBACK FORM

Title of manual:

IRC 4 Configurator for Intelligent Relay Card Configuration

Reference: MAIRC4-SW/E Edition 1 **Date of issue:** Feb 11/08

Customer contact details:

Name _____ Job Title _____

Company _____ *Email* _____

Address _____

Signature _____ *Date* _____

General feedback:

Please answer the following questions:

• Is the document well organized?	**Yes**	**No**
• Is the information technically accurate?	**Yes**	**No**
• Is more technical detail required?	**Yes**	**No**
• Are the instructions clear and complete?	**Yes**	**No**
• Are the descriptions easy to understand?	**Yes**	**No**
• Are the examples and diagrams/photos helpful?	**Yes**	**No**
• Are there enough examples and diagrams/photos?	**Yes**	**No**
• Is the style/wording easy to read?	**Yes**	**No**
• Is any information not included? (please list in “comments” below)	**Yes**	**No**

Additional feedback:

(Please continue overleaf)

(Continued)

(Please continue on a separate sheet if necessary)