Microchip Automotive Target Manager (MATM) User's Guide

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Preface

NOTICE TO CUSTOMERS

All documentation becomes dated, and this manual is no exception. Microchip tools and documentation are constantly evolving to meet customer needs, so some actual dialogs and/or tool descriptions may differ from those in this document. Please refer to our web site (www.microchip.com) to obtain the latest documentation available.

Documents are identified with a "DS" number. This number is located on the bottom of each page, in front of the page number. The numbering convention for the DS number is "DSXXXXXA", where "XXXXX" is the document number and "A" is the revision level of the document.

INTRODUCTION

This chapter contains general information that will be useful to know before using the Microchip Automotive Target Manager (hereinafter known as MATM). Topics discussed in this chapter include:

- Document Layout
- Conventions Used in this Guide
- Term Definitions
- Acronyms
- Recommended Reading
- The Microchip Web Site
- Customer Support
- Document Revision History

DOCUMENT LAYOUT

This user's guide describes how to use the MATM. The document is organized as follows:

- Chapter 1, General Information – This chapter provides information on the intended use of the product, system requirements, preconditions to follow for proper product use, configuration settings, software installation, and hardware connections.
- Chapter 2, Introduction – This chapter introduces the MATM. It provides a brief overview of its features and describes an example system setup using a Physical+ Interface Board as target application board.
- Chapter 3, Software Navigation – This chapter gives an overview over the user interface and explains the features of the Main window.
- Chapter 4, Manage the Target – This chapter explains the features that are available to manage the target.
- Chapter 5, Trouble Shooting – This chapter describes some common problems associated when running the MATM packet and the steps to follow to resolve those problems.

- Appendix A, IPF File Format – This chapter describes the *ipf. file format.
- Appendix B, Header File Format Examples – This chapter describes the *h. file format for an OS81118.
- Index

CONVENTIONS USED IN THIS GUIDE

This user's guide uses the following documentation conventions:

Description	Represents	Examples
Bold characters	A dialog button	**Flash** button
Italic characters	Field or menu entry in the GUI	*Target, Clear*
	Name of a folder	*Logs*
	Name of a LED	*Pwr*
Initial caps	A window	Main window
	An area in a window	Log Information area
Courier font	Path	`c:\`
	File name	`Configuration.ipf`

TERM DEFINITIONS

This user's guide uses the following term definitions:

Term	Definition
Configuration data	For INIC firmware versions 2.2.0 and below, the configuration data is the configuration string. Starting with INIC firmware version 2.3.0, the configuration data is the configuration string and the identification string.
Dump	File that contains the debugging information of the target chip.
INIC Explorer Interface Box	The hardware interface box that is used for accessing the target chip through the Configuration/Debug Header.
Log	File that contains the log information of the target chip.
Microchip Automotive Target Manager	The software component that helps to manage the targets.
Off-Line mode	This mode can be selected in the *Target* drop down menu. It allows to manage the configuration information included in the *.mchpkg file without any hardware connected to a COM port.
Target	The item that is on focus, e.g., the INIC on the target application board. The target is selected in the *Target* drop down menu (see Figure 3-1). All actions conducted in the MATM focus on the selected target.
Target application board	This can be your own application board or Microchip's Physical+ Interface Board to which the INIC Explorer Interface Box is connected.
Target package	The *.mchpkg file that includes all files required to manage the target.
Text field	Text box in the GUI in which information can be entered.

ACRONYMS

This user's guide uses the following acronyms:

Acronym	Definition
BIST	Build-in Self-Test
INIC	Intelligent Network Interface Controller
MATM	Microchip Automotive Target Manager

RECOMMENDED READING

This user's guide describes how to use the MATM. Other useful documents are listed below.

[1] INIC Hardware Data Sheet

[2] INIC User's Guide

[3] Physical+ Interface Board OS81118/Coaxial

The documents are available through: support-ais-de@microchip.com.

THE MICROCHIP WEB SITE

Microchip provides online support via our web site at www.microchip.com. This web site is used as a means to make files and information easily available to customers. Accessible by using your favorite Internet browser, the web site contains the following information:

- **Product Support** – Data sheets and errata, application notes and sample programs, design resources, user's guides and hardware support documents, latest software releases and archived software
- **General Technical Support** – Frequently Asked Questions (FAQs), technical support requests, online discussion groups, Microchip consultant program member listing
- **Business of Microchip** – Product selector and ordering guides, latest Microchip press releases, listing of seminars and events, listings of Microchip sales offices, distributors and factory representatives

CUSTOMER SUPPORT

Users of Microchip products can receive assistance through several channels:

- Distributor or Representative
- Local Sales Office
- Field Application Engineer (FAE)
- Technical Support

Customers should contact their distributor, representative or field application engineer (FAE) for support. Local sales offices are also available to help customers. A listing of sales offices and locations is included in the back of this document.

For technical support contact: support-ais-de@microchip.com.

DOCUMENT REVISION HISTORY

Revision A (July 2014)

Initial release of this document.

Revision B (December 2014)

- Customer Support: updated support address
- Chapter 3, Software Navigation: updated description in respect to *Off-Line* mode
- Section 3.3, Perform Off-Line Configuration of a Target: added section
- Section 4.1.4, Export a Configuration Profile: updated section
- Appendix A, IPF File Format: added chapter

Revision C (February 2015)

- Section 4.1.4, Export a Configuration Profile: updated section
- Appendix B, Header File Format Examples: added chapter

Revision D (April 2015)

- Appendix B.5, Legacy Header File Format: added section

Revision E (March 2016)

- General:
  - added identification string
  - changed 'INIC Firmware and Configuration String.ipf' to 'Firmware and Configuration.ipf'
  - changed 'INIC Configuration String.ipf' to 'Configuration.ipf'
- Term Definitions: added 'Configuration data'
- Section 4.1, Configuration Data: updated Figure 4-1; added paragraph Identification String
- Appendix A.2, Header with Data Area, Table A-3: added Note 1

Chapter 1. General Information

1.1 PACKAGE OVERVIEW AND INTENDED USE

The Microchip Automotive Target Manager package consists of the Microchip Automotive Target Manager (the MATM software) and the INIC Explorer Interface Box (the MATM hardware). The package is used to perform operations on a Target.

1.2 SYSTEM REQUIREMENTS

- Windows® 7 or newer version
- .NET Framework 4.0 or newer version

1.3 SUPPORTED TARGETS AND FIRMWARE VERSIONS

For information refer to the dialog box in the MATM installer.

1.4 SOFTWARE INSTALLATION

Steps for installing the Microchip Automotive Target Manager include:

- Contact support-ais-de@microchip.com to get your login information.
- Execute the installer and follow the steps shown to complete the setup.

1.5 PRECONDITIONS

Use of the MATM assumes you have:

- Read the MATM-related documents
- Properly installed the MATM.

If you use a physical device that is connected to a COM port on your PC/laptop, you should also have:

- Setup the DIP switch settings of the INIC Explorer Interface Box as shown below:

DIP Switch PID		
2	**1**	**0**
OFF	ON	ON

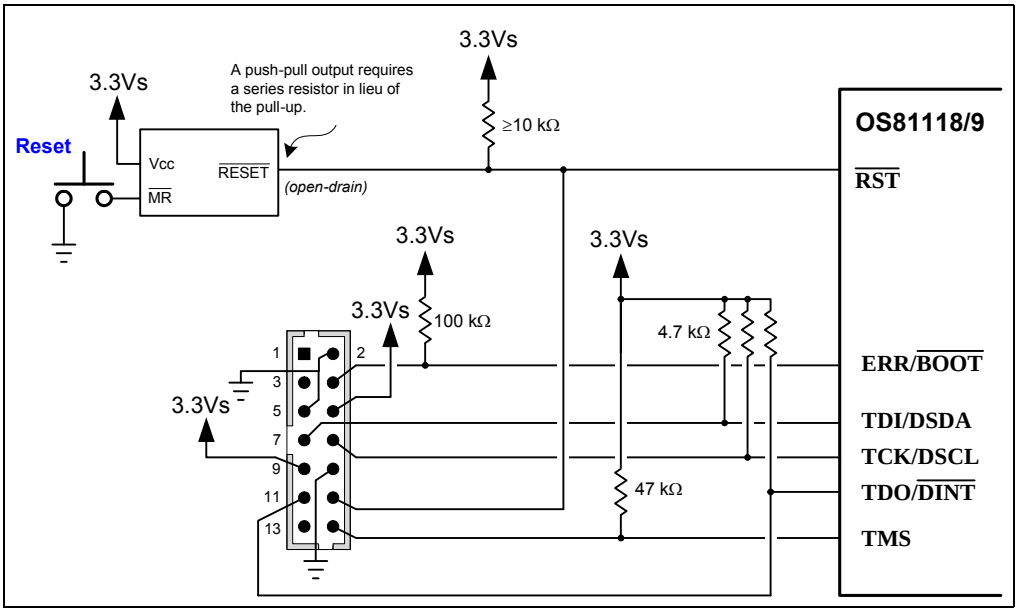
DIP switches for Baud0 and Baud1 can remain OFF.

- Connected the INIC Explorer Interface Box to the Configuration/Debug Header. If you use your own target interface board, refer to the Configuration/Debug Header Connection Diagram.
- Properly connected the INIC Explorer Interface Box to your PC/laptop.
- Properly powered all devices.

1.6 CONFIGURATION/DEBUG HEADER CONNECTION

Figure 1-1 shows the connections between the OS81118/9 and the Configuration/ Debug Header to which the INIC Explorer Interface Box must be connected. For further information refer to the INIC Hardware Data Sheet [1].

FIGURE 1-1: CONFIGURATION/DEBUG HEADER CONNECTION DIAGRAM



1.7 INIC EXPLORER INTERFACE BOX STATUS LEDS

To get status information on the connection and the powering of the INIC Explorer Interface Box, refer to Table 1-1. The 'Error' column indicates if the status information refers to a normal behavior or to an erroneous behavior.

TABLE 1-1: INIC EXPLORER INTERFACE BOX STATUS LEDS

Name	Color	Error	Status Information
Pwr	Green, illuminated	No	The INIC Explorer Interface Box is powered.
Conn	Yellow, illuminated	No	The connection between the INIC Explorer Interface Box and the PC/laptop is valid.
Com	Yellow, illuminated/ flickering	No	A command is received from the PC/laptop, e.g., during the flash process.
App	Red, shortly flickering	No	The INIC Explorer Interface Box was reset by pressing the reset knob.
	Red, illuminated	Yes	A connection error between the INIC Explorer Interface Box and the PC/laptop has been detected, e.g., there is no cable connected.
Ext. Rev	Red, illuminated	Yes	A connection error between the Configuration/ Debug Header of the INIC Explorer Interface Box and the Configuration/Debug Header of the target application board has been detected, e.g., the connector was connected the wrong way. Note, the connection error is only indicated after the INIC Explorer Interface Box has been powered up or the reset knob on the INIC Explorer Interface Box has been pressed.

Chapter 2. Introduction

With the MATM comes a multi-purpose software that allows operating the Target in several aspects. Tool features, for example flashing or managing a target, were previously available by different tool solutions. Now, the MATM has them incorporated into one tool.
Among others, the functionality provided by the MATM includes:

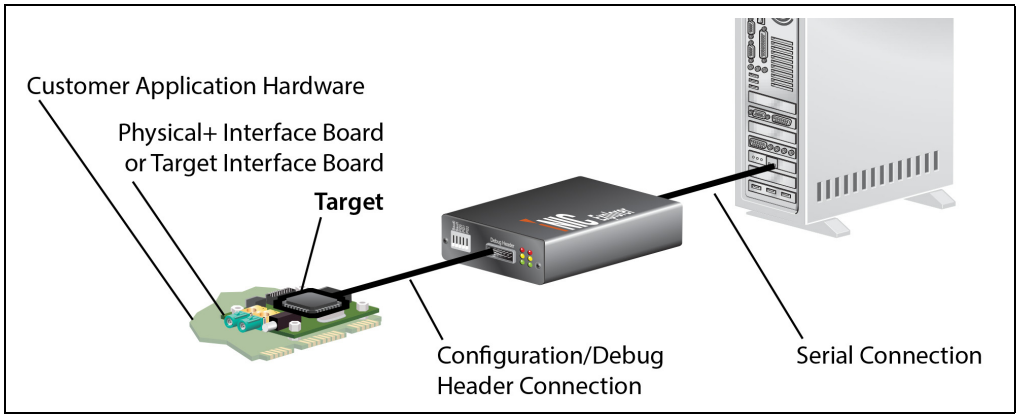
- Modify, validate, and write target configuration data
- Export the target configuration for use with an EHC
- Read the target's integrity information
- Visualize network, device, and target resource Information
- Dump target memories

2.1 EXAMPLE SYSTEM SETUP

Although this user's guide describes the MATM, a short section has been added to show you the principles of the system setup when the target is of type INIC.
To be able to use the MATM and to operate the target, the INIC Explorer Interface Box must be connected to the Configuration/Debug Header mounted on the target interface board (e.g., the Physical+ Interface Board OS81118 / Coaxial, [3]) and to the COM port of your PC/laptop. If all devices are powered properly, and all Preconditions have been fulfilled, the location of the target can start. Read more about it in section Find a Target That is Connected to a COM Port.

A rough outline of an example system setup is depicted in Figure 2-1.

FIGURE 2-1: EXAMPLE SYSTEM SETUP



NOTES:

Chapter 3. Software Navigation

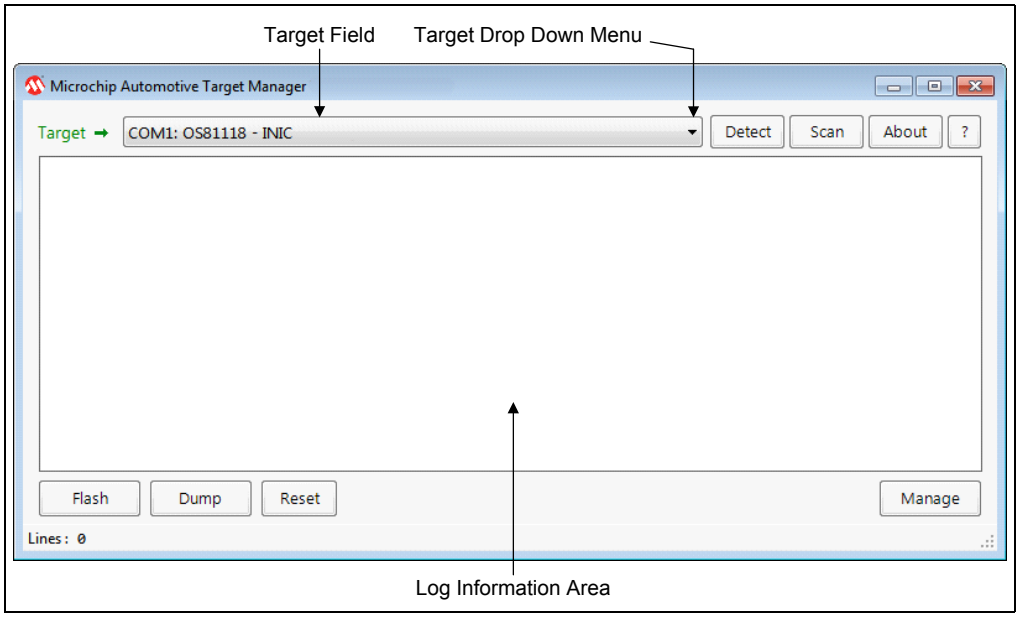
The MATM is organized in a manner that the main features of the software can be accessed on top of the GUI. The GUI buttons are self-explaining: when hovering over a button the cursor symbol changes and a tool tip is shown.

After the installation is finished, the MATM is automatically started, showing its Main window. At this stage, limited functionality is provided, since the first action to perform is locating a Target. Usually, a target is a physical device connected to a COM Port. However, if you do not possess a physical device or you want to access features that do not necessitate a physical device, you can use the Off-Line mode.

Note: The MATM can only locate targets that come from Microchip.

After a target has been located (or selected via the *Target* drop down menu), the whole functionality is available. Figure 3-1 shows an example of the Main window, in which a physical device was selected.

FIGURE 3-1: MAIN WINDOW



3.1 OPEN THE USER'S GUIDE

Click '**?**'.

3.2 FIND A TARGET THAT IS CONNECTED TO A COM PORT

The method to find a target depends on whether a COM port is known:

- If a COM port is unknown:
  Click **Scan**.
  After the scan is finished, the *Target* drop down menu is opened, showing a list of COM ports and their associated targets. If no or the wrong target hardware has been connected to a COM port, the *Target* field will indicate that no compatible interface was found.

Note:	If you scan a large number of COM ports with no devices attached, the scan can take some time.

- If the COM port is already known and you know the target that is connected to it:
  Open the *Target* drop down menu to select the COM port.
- If the COM port is already known, but the target has been changed (e.g., another target was connected to the COM port):
  Click **Detect.**
  The detection will show you the target that is associated to this COM port.

Note:	If an INIC Explorer Interface Box is used that has not the latest MATM installed, an automatic update process is started after **Scan** or **Detect** has been clicked.

3.3 PERFORM OFF-LINE CONFIGURATION OF A TARGET

The MATM offers the possibility to customize the configuration data of a target without any hardware connected to a COM port.

- Select *Off-Line* in the *Target* drop down menu
- Click **Manage**.
- Select the *.mchpkg file.
- Continue with Configure Properties.
- Continue with Export a Configuration Profile.

3.4 DISPLAY DETAILED PRODUCT AND CHIP-RELATED INFORMATION

Click **About**.
The Log Information area shows important data about the MATM including file, revision, and path information. In addition it gives information on the chip such as hardware revision and boot monitor version. It also lists the license information.

3.5 MONITOR AND HANDLE LOG INFORMATION

The results of the operations performed with the MATM are shown in the Log Information area of the Main window (see Figure 3-1). It is recommended to focus on the log information from the beginning of your work, since it provides you with information related to the operations done with the MATM. Listed operations include the monitoring of processing steps, instructions, and error reporting.

The information shown in the Log Information area are persistent as long as the area is not cleared, see Section 3.10.1.

If the Log Information area lists errors, refer to Chapter 5.

3.6 UPDATE THE TARGET FIRMWARE AND THE CONFIGURATION DATA

- Click **Flash**.
  This opens the Windows Explorer folder.
- Navigate to the firmware package folder that matches your target chip.
- Select the *.mchpkg file.
  The Flash Option window opens.
- Make your selections.
- Start flashing.
- Pay attention to the information shown in the Log Information area.

Note:	Do not interrupt the flash process.

Note:	If your flash options include the firmware, the firmware will be always flashed first.

3.7 RESET THE TARGET

If the hardware must be reset, but provides no switch, this functionality can be used to reset the target.

Click **Reset**.

3.8 RECOVER THE TARGET

If a target on a COM port cannot be detected after target restart, the *Target* field will indicate this by showing that a compatible interface cannot be found. To resolve this issue, the recovery mechanism can be used.

- Click **Recovery**.
  This will try to switch the target into boot monitor mode. If the target cannot enter boot monitor mode, the operation should be tried multiple times.
- Proceed with the steps as listed in Section 3.6.

Note:	Recovery is only applicable with an INIC Explorer Interface Box and a target connected to the COM port. This feature is not supported for non-Microchip devices.

3.9 DUMP TARGET INFORMATION

- Click **Dump**.
  This opens the Dump window.

> **Note:** For standard use cases, a dump of *Optional Resources* is not required. This is only recommended upon Microchip support request.

- Start with the dump.
  This stops the application running on the target chip and performs a target reset after the dump has been finished.

After the dump is finished, the file is automatically stored and can be loaded from the *Dumps folder*. Additionally, the path of the file location is shown in the Log Information area.

3.10 PERFORM ACTIONS PROVIDED BY THE LOG INFORMATION AREA

The following actions are accessible via a right-click into the Log Information area.

3.10.1 Clear Log Information

Click *Clear*.
This deletes all content shown in the Log Information area.

3.10.2 Remove Temporary MATM Files from Your System

Temporary files may not be cleaned-up by the tool for example when a tool crash occurs. To avoid your PC running out of disk space, it is recommended to empty the temporary files folder of your system from time to time. The removal of temporary files is also recommended before the MATM is un-installed.

Click *Clear Temporary Files*.

3.10.3 Copy Log Information to the Clipboard

If you want to copy only a specific line or section that you have marked:

Click *Copy*.

If you want to copy all information:

Click *Copy All*.

3.10.4 Access Stored Log/Dump Information

The context menu entries only become active after log/dump files have been generated.

Click *Open Logs/Dumps Folder.*
This jumps to the logs/dumps saved in your *Logs/Dumps* folder.

The information is required for customer support, see Section 3.10.6.

3.10.5 Force Auto Scroll to Last Line

Click *Auto Scroll to Last Line.*
This forces a jump to the last line in the Log Information area, after a new log entry was generated.

3.10.6 Make a Backup of All Files

If you run into problems while using the MATM and you cannot resolve the issue, Microchip recommends performing a file backup.

- Click *Backup Application Folders*.
  This makes a backup of the application folder including *Dumps* and *Logs* and stores them in a *.zip file.
- Email the *.zip file along with the problem description to the customer support: support-ais-de@microchip.com.

3.11 MANAGE THE TARGET

Each target that has been found in the *Target* field during the **Scan** or **Detect** process can be managed. The action is applied to that target which is shown in the *Target* field.

While managing a specific target, at any time another target can be selected. This allows to run, compare, or modify different targets in parallel. If the MATM is running several targets, it is recommended to focus on the *Target* field, which indicates the target that is on scope. Since the title of the Manage window includes the same information, focusing on the right target is easy at any time.

- Click **Manage**.
  This opens the Package Selector window, showing a list of available packages.
- Make your selection (or click **Browse** to find packages stored at other locations).
  This opens the Manage window.

Note:	The package that is selected to manage the target must match the package that was flashed.

Note:	To constantly access information about the target, ensure that your log information shown in the Main window is not hidden by the Manage window.

Refer to Chapter 4 for the features that are available to manage a target.

NOTES:

Chapter 4. Manage the Target

Once the manage functionality has been enabled, the MATM offers access to a feature set that can be used to configure the properties of the INIC and to check and validate its status information. Among other features, the MATM also allows the reading of INIC resource information.

For a detailed property description refer to the INIC User's Guide [2].

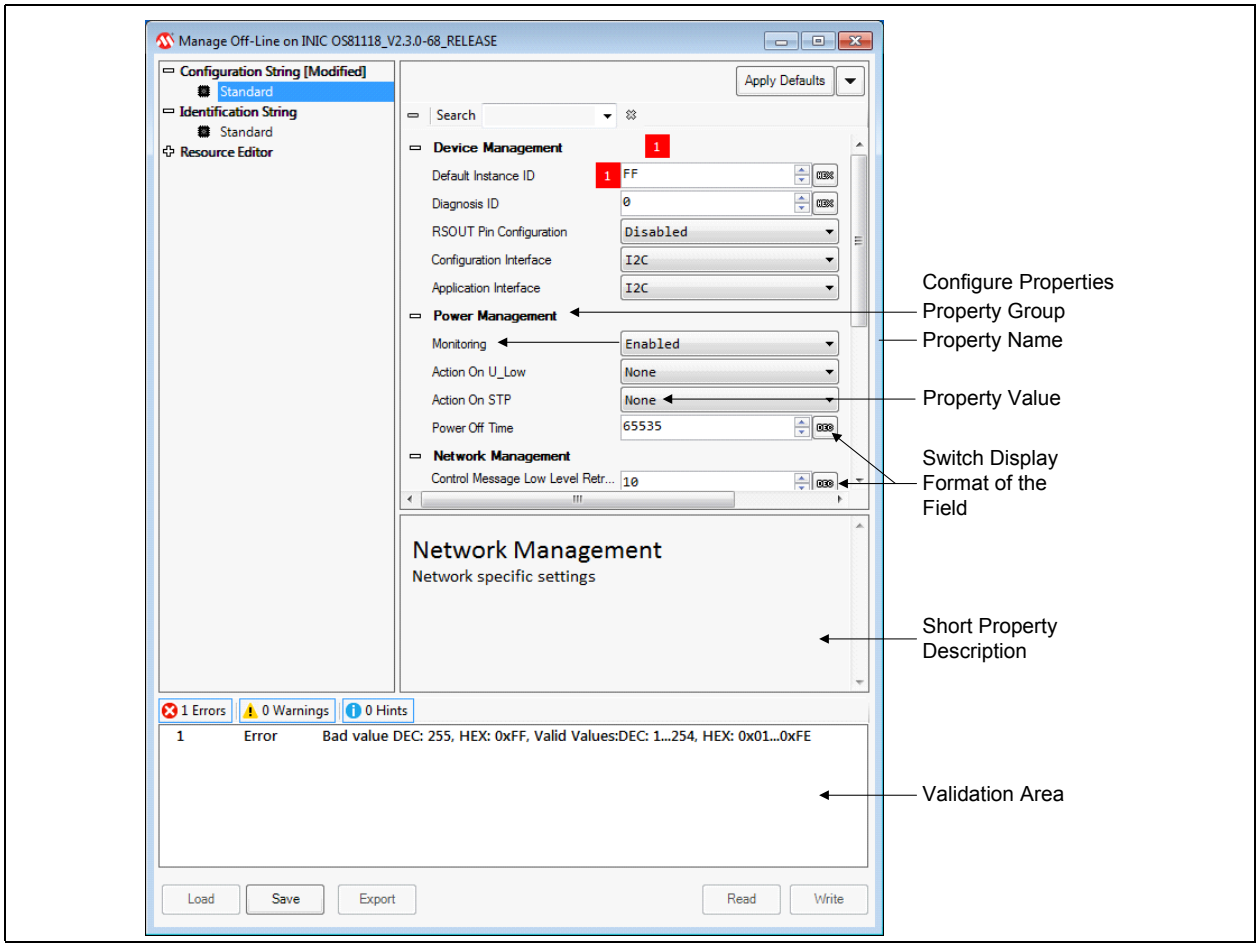
4.1 CONFIGURATION DATA

Configuration String

The configuration string consists of a list of factory default values that are used as information on the target's initial hardware configuration. If the factory default values do not match the settings required for your application, you can customize the configuration profile and write it to the target. The new configuration will be available after target reset.

A view of the configuration string is shown in Figure 4-1.

FIGURE 4-1: MANAGE WINDOW – TARGET CONFIGURATION STRING



Identification String

The identification string consists of a list of factory default values that are used for unambiguous device identification. Customization of the identification profile and the writing of the data to the target is done in the same way as described for the configuration string. The new configuration will be available after target reset.

4.1.1 Configure Properties

As shown in Figure 4-1, the configuration properties are organized in groups, such as Device Management and Power Management.

Each property value can be customized, either by directly entering the value in the *Property Value* field or by using the up and down arrows.

Some numeric fields offer the capability to switch numbers from decimal to hexadecimal and vice versa. If the switch shows **DEC**, only values of this numbering system are allowed to be entered, the same applies for **HEX**.

To each property a short description is assigned. It can be found right below the properties.

Validation area

During the customization of the property values, it can happen that the configured data does not match the validity check for a proper configuration definition or a hint is required for giving further information on the setting. In any case, if a property value is defined in a way that it requires additional information, the Validation area will immediately show the classification of the information type (e.g., error) and a description that allows to fix the issue, see Figure 4-1.

To easily access the property, just click on the description. The tool jumps to the property that is now highlighted red.

If required, the factory default configuration data setting can be restored at any time. Click **Apply Default**.

Errors

An invalid property value may generate errors with a number assigned to it. The number is shown left to the *Property Value* field and it indicates the number of errors related to this property, see Figure 4-1.

Note:	Before the values can be written to the configuration data section, all errors must have been resolved.

Warnings

A warning is a message for a property setting that may be accepted, but can enforce an unwanted behavior in special cases.

Hints

A hint serves as additional information to a property.

4.1.2 Save a Configuration Profile

Click **Save**.
This saves your modified configuration profile. For the saved file a short caption can be entered.

4.1.3 Load a Pre-Saved Configuration Profile

Click **Load**.
This loads a configuration profile that was previously saved.

> **Note:** Do not load a configuration profile that is originated from a different target version. As some properties may change, it can happen that the configuration profile will be not compatible to the one which is required by your target. In this case an error will be reported.

4.1.4 Export a Configuration Profile

Click **Export**.
This exports the current configuration into a file, which then can be integrated into your tool chain.

For flashing the target, it is possible to export the configuration profile as binary files (*.ipf) or as header files (*.h). Besides the file type, you can decide what content of the configuration profile should be exported:

- `Firmware and Configuration`: Files of this type contain the image for the firmware and the configuration data.
- `Configuration`: Files of this type contain only the image for the configuration data

> **Note:** A change in the configuration data section entails a new CRC calculation before the files are exported. If the CRC fails, no file export will be possible. For assistance contact our customer support. Contact data can be found in Chapter 5.

The *.ipf or *.h files can be used for flashing the INIC over the EHC. Here it is up to you to provide an adequate program memory environment on the EHC for a seamless integration.

For information on the *.ipf file format, refer to Appendix A.

For information on the *.h file format, refer to Appendix B.

4.1.5 Read the Configuration Profile

Click **Read**.
This reads the configuration profile from the target chip.

> **Note:** Use this feature for being sure that the property values shown in the GUI are aligned to the property values provided by the target.
> The MATM does not automatically update the property values. The update is only done on user request.

4.1.6 Write the Configuration Profile

Click **Write**.
This stops running the target. An attached EHC will be detached. After this, the target turns into flash mode and the configuration profile can be written. If the writing is finished, the target is reset.

> **Note:** Use this feature for being sure that the property values shown in the GUI are written to the target, so that the target can run the configuration.

4.1.7 Apply Factory Default Values to the Configuration Profile

Click **Apply Defaults.**
This loads the factory default values of all properties.

Note:	To write the values to the target's configuration data section, click **Write**.

4.2 READ INTEGRITY INFORMATION

The report of the integrity check includes information on the Build-in Self-Test (BIST) and on the configuration data. The BIST checks for example the chip hardware, the firmware, and the boot monitor version and verifies if all components are compatible to each other. The check on the configuration data includes the validation of the default image that is used.

All check results must be OK. Proper target operation can be only ensured in case the report results are free of errors and warnings.

The integrity check is automatically performed at chip start up and at the end of the flash cycle (after reset). The information is shown in the Log Information area.

In addition, the check can be done at any time on user request (when selecting the item or clicking the **Read** button). The user request is useful for the case when the report is read, but the check on the integrity information has not yet been finished. Depending on the moment the report is read, the check couldn't have been finished, since some checks require more time than others, e.g., the CRC check. All check results, this includes the result OK or any option that is divergent from OK, are directly stated as property value. This means, errors and warnings are reported as property values and not in the Validation area.

Click **Read**.
This reads out the target's BIST state and the configuration data information.

4.3 READ NETWORK, DEVICE, AND RESOURCE INFORMATION

Network information

This section provides information on the properties that are related to the MOST® network, including the attach state and the system configuration state.

Device information

This section provides information on the properties that are related to the device, including the attach state and the power state.

Resource information

This section provides information on the target's ports, sockets, and connections.

The information shown in these sections are updated via user request, this is when the item is selected or when the **Read** button is clicked.

4.3.1 Read the Information

Since the network, device, or resource information can change during runtime, the user can access the latest information by using this feature.

Click **Read**.
This reads out the current network, device, or resource information.

Note:	Use this feature for being sure that the property values shown in the GUI are aligned to the property values provided by the target. The MATM does not automatically update the property values. The update is only done on user request.

4.3.2 Export the Information

Click **Export**.
This exports the current network, device, or resource information as JSON file format. For information on the file format, refer to www.json.org.

NOTES:

Chapter 5. Trouble Shooting

This chapter describes some common problems associated when running the MATM package and the steps to follow to resolve those problems.

To resolve an error, a standard procedure may be performed. However, if the error is related to a problem that cannot be fixed with the standard procedure, refer to the sections below, in which specific error cases are listed. Refer to the error corrections for resolving the problem.

If you cannot resolve the problem, it is recommended to perform a backup of the application folder, see Section 3.10.6. Email the description of the problem and the *.zip file to: support-ais-de@microchip.com.

5.1 STANDARD PROCEDURE

1. Close the MATM.
2. Check all hardware connections. See also Section 1.5 and Section 2.1.
3. Check the LED display on the INIC Explorer Interface Box and verify if everything is displayed correct (Conn and Pwr LEDs are illuminated). For details refer to Table 1-1.
4. Press the Reset knob of the INIC Explorer Interface Box.
5. If necessary reset the target.
6. Restart the MATM.
7. Click **Detect**.

5.2 ERRORS RELATED TO THE INIC EXPLORER INTERFACE BOX

Possible Errors	Error Correction
The INIC Explorer Interface Box is not powered.	Power the INIC Explorer Interface Box.
The serial connection between the INIC Explorer Interface Box and the PC/laptop is not working.	- If you use an RS-232 to RS-232 connection, check if everything is properly plugged. - If you use an RS-232 to USB connection, check if you use the appropriate USB driver.
The 14-pin ribbon cable connection is not working.	Properly connect the cable to the Configuration/Debug Header. Focus on the right connection direction (pin 1 assignment) and on the proper cable connection (pin-to-pin connectivity). Also make sure that the ribbon cable is not interrupted (broken).

5.3 ERRORS RELATED TO THE MATM

Possible Errors	Error Correction
The software cannot be installed.	- Check if you have administration rights. - Make sure that the system requirements are fulfilled.
The software cannot be started.	- Check if the installation was successful.
The target cannot be found.	- Make sure that you use an appropriate firmware package. - Make sure that you use a target that is supported by the MATM.

5.4 ERRORS RELATED TO THE TARGET

Possible Errors	Error Correction
The target cannot be found.	Check if the target is properly powered.
	Properly connect the cable to the Configuration/Debug Header. Focus on the right connection direction (pin 1 assignment) and on the proper cable connection (pin-to-pin connectivity). Also make sure that the ribbon cable is not interrupted (broken).
The INIC resides in reset or is held in boot monitor mode.	Check if the INIC is visible to the MOST network.

Appendix A. IPF File Format

The *.ipf file consists of two main fields:

- A Main Header and a
- Header with Data Area.

A.1 MAIN HEADER

The Main Header is the first field, has a fixed size of 6 bytes and looks as follows:

TABLE A-1: IPF FILE - MAIN HEADER FORMAT

Offset	Name	Size	Examples
0x00	MagicByte	1 byte	0x01
0x01	ChipID	1 byte	0x18 for OS81118 0x19 for OS81119
0x02	Reserved	4 bytes	Filled with 0xFF

A.2 HEADER WITH DATA AREA

The second field is dynamic and structured as a sequence of memory images, with a maximum of two. Each memory image has a Header of 10 bytes and a Data Area. Both are structured as follows:

TABLE A-2: IPF FILE - HEADER WITH DATA AREA FORMAT

Offset	Name	Size	Examples	Memory Image
Header				
0x06	ImageID	1 byte	ImageID[1]	Memory Image 1[2]
0x07	Reserved	1 byte	0x01	
0x08	StartAddress	4 bytes	Big Endian (Hi, Lo, Hi, Lo)	
0x0C	ImageLength	4 bytes	Big Endian (Hi, Lo, Hi, Lo)	
Data Area[3]				
0x10	ImageData			
...				
Header				Memory Image 2[2]
0x06	ImageID	1 byte	ImageID[1]	
0x07	Reserved	1 byte	0x01	
0x08	StartAddress	4 bytes	Big Endian (Hi, Lo, Hi, Lo)	
0x0C	ImageLength	4 bytes	Big Endian (Hi, Lo, Hi, Lo)	
Data Area[3]				
0x10	ImageData			
...				

Note 1: For firmware = 0x01, for configuration data = 0x02

2: For proper StartAddress and ImageLength values, refer to Table A-3.

3: The first Data Area always starts from address 0x10.

As shown in Table A-2, there is a generic overview of the possible ImageID values used for both usage models:

- flashing the firmware and the configuration data by using the `Firmware and Configuration.ipf` or
- flashing the configuration data only by using the `Configuration.ipf`.

When flashing the configuration data (ImageID = 0x02), Memory Image 1 will be written. If the firmware and the configuration data have to be flashed, Memory Image 1 will carry the firmware data (ImageID = 0x01) and Memory Image 2 the configuration data (ImageID = 0x02). In addition, Table A-3 shows the StartAddress and the ImageLength information for the memory images. Per definition, values for StartAddress and ImageLength are pre-defined in the image, see also the INIC User's Guide [2].

TABLE A-3: OS81118/9 StartAddress AND ImageLength FOR FIRM-WARE AND CONFIGURATION DATA

Used IPF-File: `Firmware and Configuration`**.ipf**				
Memory Image #	**Header Field Name**	**High Word**		**Low Word**
1 (firmware)	StartAddress	0x00	0x00	0x1800
	ImageLength	0x00	0x02	0xE800
2 (configuration data)	StartAddress	0x00	0x03	0x0000
	ImageLength	0x00	0x00	Note 1
Used IPF-File: `Configuration`**.ipf**				
Memory Image #	**Header Field Name**	**High Word**		**Low Word**
1 (configuration data)	StartAddress	0x00	0x03	0x0000
	ImageLength	0x00	0x00	Note 1

Note 1: For INIC firmware versions 2.2.0 and below, the configuration data is the configuration string; the Low Word size is 0x0080.
Starting with INIC firmware version 2.3.0, the configuration data is the configuration string and the identification string; the Low Word size is 0x0200.

Legend:

To be ignored

Start page. Required for flashing the firmware. Usually the firmware starts on page 0.

Last page. Required for switching pages when flashing the firmware (e.g., 0x00, 0x01, 0x02)

StartAddress. Used for boot monitor address calculation

ImageLength. Used for boot monitor length calculation

Appendix B. Header File Format Examples

The *.h file consists of the following sections:

- Target Information Defines
- INIC Firmware Defines[1]
- INIC Configuration Defines
- Data Representation Define

Note: This section shows header file examples for an OS81118.

B.1 TARGET INFORMATION DEFINES

#define INIC_CHIP_NAME	"OS81118"
#define INIC_CHIP_ID	"0x18"
#define INIC_FW_VERSION	"V2.1.0-45"
#define INIC_FW_VERSION_MAJOR	2
#define INIC_FW_VERSION_MINOR	1
#define INIC_FW_VERSION_RELEASE	0
#define INIC_FW_BUILD_NUMBER	45

B.2 INIC FIRMWARE DEFINES

#define INIC_FW_IMAGE_DATA_OFFSET	0x00001800
#define INIC_FW_IMAGE_DATA_SIZE	0x0002E800

B.3 INIC CONFIGURATION DEFINES

#define INIC_CS_IMAGE_DATA_OFFSET	0x00000000
#define INIC_CS_IMAGE_DATA_SIZE	see Note 1

1. Firmware-related data is only included in configuration profiles of type `Firmware and Configuration`.

B.4 DATA REPRESENTATION DEFINE

```
#ifndef INIC_IMAGE_DATA_TYPE
   #define INIC_IMAGE_DATA_TYPE            const unsigned char
#endif

INIC_IMAGE_DATA_TYPE INIC_FW_IMAGE_DATA[INIC_FW_IMAGE_DATA_SIZE] = {
..., ..., ...,
..., ..., ...,
..., ..., ...,
};[1]

INIC_IMAGE_DATA_TYPE INIC_CS_IMAGE_DATA[INIC_CS_IMAGE_DATA_SIZE] = {
..., ..., ...,
..., ..., ...,
};
```

B.5 LEGACY HEADER FILE FORMAT

If it is required to build a flasher that is based on the *.ipf file format, you can use the legacy header file described below. However, Microchip recommends to use the new, more simply format described in Section B.1 to Section B.4 for flashing the INIC firmware and/or the configuration data.

Note: The old format probably will be discontinued.

B.5.1 Header File Format Examples

B.5.1.1 MAIN HEADER DEFINES

#define MAIN_HEADER_OFFSET	0x00
#define MAIN_HEADER_SIZE	0x06
#define MAIN_HEADER_MAGIC_BYTE_OFFSET	MAIN_HEADER_OFFSET + 0x00
#define MAIN_HEADER_MAGIC_BYTE_SIZE	0x01
#define MAIN_HEADER_CHIP_ID_OFFSET	MAIN_HEADER_OFFSET + 0x01
#define MAIN_HEADER_CHIP_ID_SIZE	0x01

B.5.1.2 INIC FIRMWARE DEFINES

#define INIC_FW_HEADER_OFFSET	MAIN_HEADER_OFFSET + MAIN_-HEADER_SIZE
#define INIC_FW_HEADER_SIZE	0x0A
#define INIC_FW_IMAGE_ID_OFFSET	INIC_FW_HEADER_OFFSET + 0x00
#define INIC_FW_IMAGE_ID_SIZE	0x01
#define INIC_FW_START_ADDRESS_OFFSET	INIC_FW_HEADER_OFFSET + 0x02
#define INIC_FW_START_ADDRESS_SIZE	0x04
#define INIC_FW_IMAGE_LENGTH_OFFSET	INIC_FW_HEADER_OFFSET + 0x06
#define INIC_FW_IMAGE_LENGTH_SIZE	0x04
#define INIC_FW_IMAGE_DATA_OFFSET	INIC_FW_HEADER_OFFSET + 0x0A
#define INIC_FW_IMAGE_DATA_SIZE	0x0002E800

B.5.1.3 INIC CONFIGURATION DEFINES

#define INIC_CS_HEADER_OFFSET	INIC_FW_IMAGE_DATA_OFFSET + INIC_FW_IMAGE_DATA_SIZE
#define INIC_CS_HEADER_SIZE	0x0A
#define INIC_CS_IMAGE_ID_OFFSET	INIC_CS_HEADER_OFFSET + 0x00
#define INIC_CS_IMAGE_ID_SIZE	0x01
#define INIC_CS_START_ADDRESS_OFFSET	INIC_CS_HEADER_OFFSET + 0x02
#define INIC_CS_START_ADDRESS_SIZE	0x04
#define INIC_CS_IMAGE_LENGTH_OFFSET	INIC_CS_HEADER_OFFSET + 0x06
#define INIC_CS_IMAGE_LENGTH_SIZE	0x04
#define INIC_CS_IMAGE_DATA_OFFSET	INIC_CS_HEADER_OFFSET + 0x0A
#define INIC_CS_IMAGE_DATA_SIZE	see Note 1

B.5.1.4 IMAGE SIZE DEFINE

```
#define INIC_IMAGE_SIZE                    INIC_CS_IMAGE_DATA_OFFSET +
                                           INIC_CS_IMAGE_DATA_SIZE
```

B.5.1.5 INIC ROM DATA

Choose the defined offsets and sizes in order to access specific fields of the data area.

```
const unsigned char INIC_ROM_Data[INIC_IMAGE_SIZE] =
{
  ..., ..., ...,
  ..., ..., ...,
  ..., ..., ...
};
```

For more information about the defines refer to Section A.1 and Section A.2.

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