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LIEBHERR

Operating instructions

Liebherr MDCx Configurator

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2025-02-13

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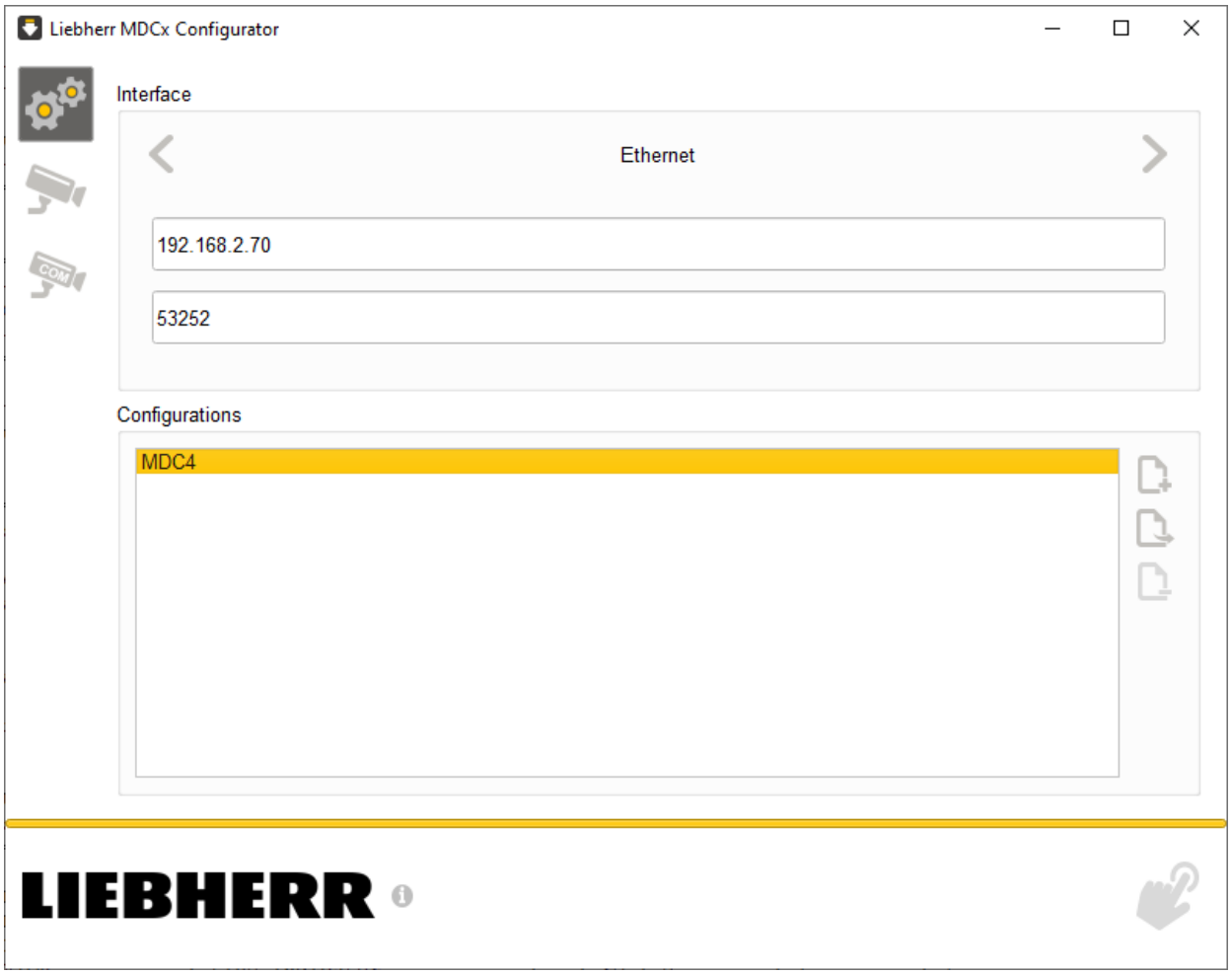

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ORIGINAL OPERATING INSTRUCTIONS

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Manufacturer

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Each purchaser of the product can obtain the source code for these software components from Liebherr-Electronics and Drives GmbH on a data carrier (CD-ROM, DVD or USB memory stick). This offer is valid within 3 years after the most recent conveyance of the object code and valid for as long as Liebherr-Electronics and Drives GmbH offers customer support for the respective product. The request should be sent by e-mail to foss@liebherr.com or by post to the following address:

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Customer Service
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Document history

Issue	Date	Revisions
01_01	2025-02-13	– First edition of the operating instructions for software version 1.1.0.0

Product history

SPF	Release	Change description	Operating instructions
1.1.0.0	2025-03	– First edition of the application	12782123-CEK06EN_01_01

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Preface

Basic information

This manual contains important information on how to operate the product safely, properly and economically.

Observance of and compliance with these instructions will help to avoid hazards and damage, reduce repair costs and downtimes and ensure the reliability and service life of the product.

These instructions do **not** replace the data, information and technical correlations contained in the associated technical documentation.

When receiving further information for the product, for example Technical Information (TI) or Service Information (SI), this information must be observed and attached to the instructions.

Always keep these instructions available on the product.

These instructions must be read and used by every person who is responsible for operating the product.

Only print these instructions in colour to show important details in the illustrations.

Illustrations in this manual may differ from the delivered version of the product and serve as examples.

For reasons of better readability, only the masculine form of words is used, without any intention of discrimination. The masculine form of the word is used here to represent a gender-neutral designation. In principle, all gender identities are meant.

Purpose of the operating instructions

The Liebherr MDCx Configurator is also referred to as the programme or application in this documentation.

These operating instructions describe the following topics:

- Scope of delivery
- Installation of the software
- Necessary hardware requirements
- Description of the functions
- Uninstalling

Liebherr-Electronics and Drives GmbH is constantly working on improving the programme through technical development. This document always describes the most recent version of the programme that has been developed.

Liebherr-Electronics and Drives GmbH reserves the right to change illustrations and descriptions in this documentation without prior information.

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User guidance

Structure of warning messages

SIGNAL WORD for classification of the danger

Type and source of the danger. Possible consequences of not observing the danger.

► Action leading to avoidance of the danger

Signal words and symbols used

The gradation of the warnings is defined by the following signal words:

- **DANGER**
- **WARNING**
- **CAUTION**
- **ATTENTION**

DANGER

Indicates a hazardous situation that, if not avoided, will result in death or serious injury.

WARNING

Indicates a hazardous situation that, if not avoided, could result in death or serious injury.

CAUTION

Indicates a hazardous situation that, if not avoided, may result in minor or moderate injury.

ATTENTION

Indicates a dangerous situation that, if not avoided, may result in damage to property.

Further symbols

Information, tip, note

This symbol indicates helpful additional information.

☐ This symbol indicates a prerequisite.

► This symbol indicates an instruction for action.

▷ This symbol indicates a result.

– This symbol indicates an equivalent listing.

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1 Safety

Read the following basic safety notes carefully before using the product. Observe the instructions when using the product.

1.1 Responsibility of the operator

The operator must ensure that:

- the software is only used for commissioning or service.
- the programme is not integrated into mobile machines, vehicles or systems.
- the programme is not used in the operational use of mobile machines, vehicles or plants. Such use may endanger life or cause high property damage.

1.2 Handling of the operating instructions

Read the operating instructions carefully before using the product. Follow the rules and instructions.

Always keep the operating instructions, including the applicable documents, easily accessible.

1.3 Staff requirements

These operating instructions are intended for developers and other specialists.

The installation of the programme requires basic IT knowledge and administrator rights on the target system. If necessary, contact the system administrator.

1.4 Changes

Unauthorised changes to the programme can impair operational safety.

1.5 Intended use

The product is a computer programme for the configuration and control of digital cameras from Liebherr-Electronics and Drives GmbH.

The programme serves as a diagnostic tool. The programme handles the typical tasks of extended vehicle diagnostics.

The main areas of application include the following diagnostic tasks:

- Reading and writing of device parameters
- Updating firmware
- Configuration of digital cameras from Liebherr-Electronics and Drives GmbH (LED)

The programme must **NOT** be used in operating mode in mobile machinery, vehicles or plants. The programme must **NOT** be permanently installed in mobile machinery, vehicles or plants.

Employees of Liebherr-Electronics and Drives GmbH hand over the programme to interested customers. The customer may use this software for the diagnosis and service of electronic products of Liebherr-Electronics and Drives GmbH.

To use the software, preparatory steps for installation on a computer are necessary.

The programme is intended exclusively for use in accordance with these operating instructions.

Unless otherwise contractually agreed, the software can be used for an unlimited period.

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2 Scope of delivery

The delivery includes:

- Programme Liebherr MDCx Configurator (Liebherr_MDCx_Configurator_Setup.exe)
- Operating instructions (this document provided electronically)

3 Installation

3.1 System requirements

- Operating system: Windows 10
- Memory: 170 MB
- Hard disk: 170 MB
- Screen: The screen must have a resolution of at least 800 x 600 pixels.
- Interfaces: 1x USB 2.0 (1x USB / Ethernet interface converter),1x Ethernet

3.2 Installing the software

The programme is supplied as an executable installation file.

► Execute the installation file Liebherr_MDCx_Configurator_Setup.exe.

► Follow the on-screen instructions.

Note

Read and write authorisation is required for the target folder in which the application is installed.

The gst-launch-1.0.exe programme must be permitted in the firewall for TCP and UDP.

The DownloadTool_CLI.exe programme must be permitted in the firewall for TCP and UDP.

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4 Programme description

4.1 Introduction

The Liebherr MDCx Configurator is a is a computer programme for the configuration and control of digital cameras from Liebherr-Electronics and Drives GmbH.

In addition, the Liebherr camera-specific PLC protocol for configuration and control is supported.

Both CAN (ISO 11898) and Ethernet (IEEE 802.3) are supported as physical bus systems.

The programme consists of two parts, the "Command-line Interface (CLI)" and the "Graphical User Interface (GUI)".

The CLI (DownloadTool_CLI.exe) contains the complete implementation of the protocol and the corresponding protocols on other layers of the OSI model.

The GUI (Liebherr_MDCx_Configurator.exe) only serves as a gateway between the user and the CLI. The graphical user interface converts user input via graphical elements into command-line parameters. Graphical elements are buttons or text fields or dialogue boxes. The GUI sends the inputs to the CLI. In return, the console outputs of the CLI are received by the GUI and displayed in a convenient way for the user. The GUI has no knowledge of the specific implementation of the CLI and serves only to increase user comfort.

4.2 Programme launch

The Liebherr MDCx Configurator is started via the file or the desktop shortcut on Liebherr_MDCx_Configurator.exe.

► Execute the Liebherr_MDCx_Configurator.exe file.

▷ The graphical user interface opens.

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4.3 Graphical user interface

4.3.1 General description of the graphical user interface

The GUI is divided into different functional areas.

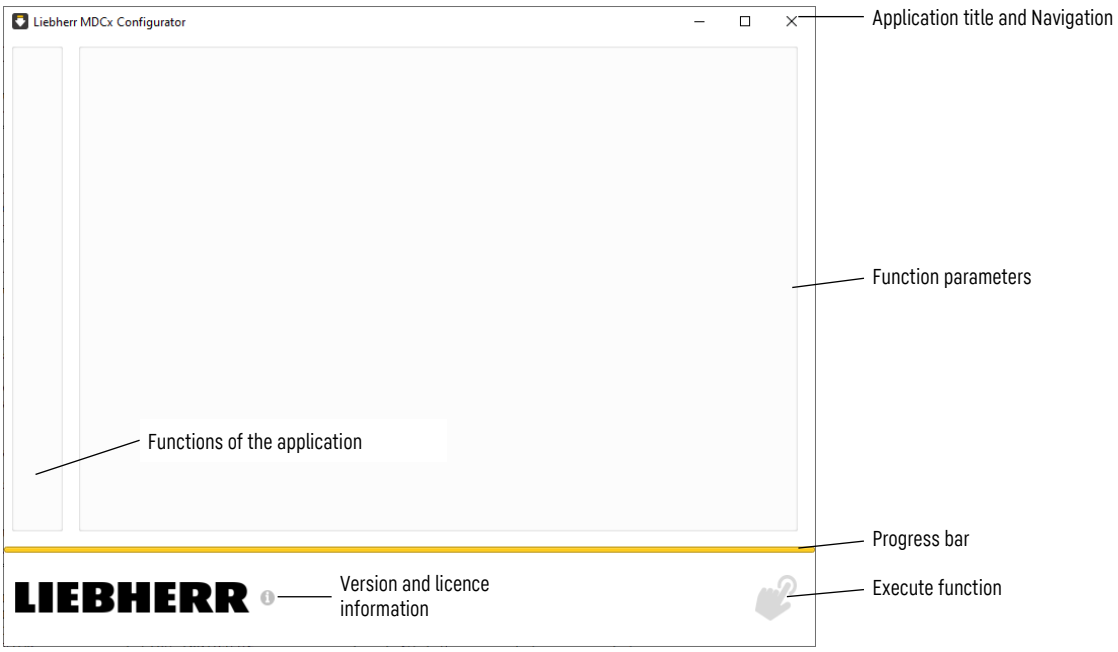

Figure 1: Structure of the user interface

Symbol	Meaning	Functional description
	Addressing	This function is used to set the communication interface to the target device. The settings can be saved for later reuse.
	Digital camera MDCx	This function can be used to configure , control and update the MDC3 or MDC4 digital camera.
	MDCx profiles	This function can be used to change the start configuration of the camera for different system configurations.

Table 1: Functions of the current version of the programme

Each of these functions has its own area for displaying the specific function parameters and the required buttons and visualisations. The specific functions are described in more detail in the following chapters.

The yellow bar above the Liebherr-logo serves as a progress bar for some functions.

Via the information icon next to the company logo, the version information of the application and the licence information can be retrieved.

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4.3.2 Addressing

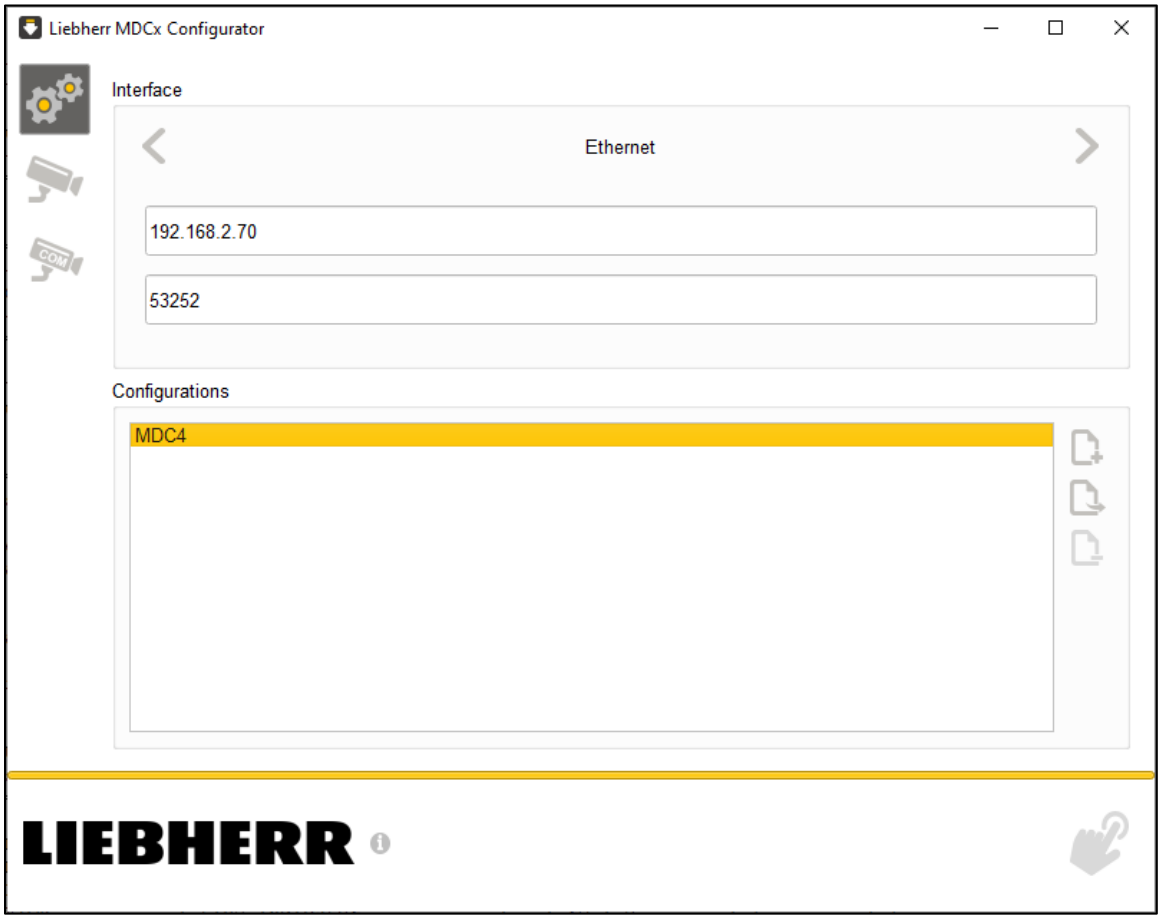


Figure 2: Addressing

This function is used to set the communication interface between the service computer (source) and the target device (target).

The interface can be selected in the Interface area. Only the Ethernet interface is possible for the MDCx camera. CAN and DoIP are prepared in the Liebherr MDCx Configurator for future protocols and interfaces. CAN and DoIP are described below but are not used in the MDCx digital camera.

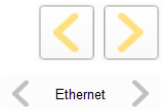
The interface configurations are managed in the Configurations area.

Set interface

The Liebherr MDCx Configurator supports different interfaces and communication protocols.

Depending on the available hardware at the service computer and the installed protocol plug-ins in the application, different interfaces can be selected via the navigation buttons.

► Select the desired interface and protocol by clicking on the navigation buttons.



▷ The selected interface and protocol are displayed between the navigation buttons. The settings available for this interface and protocol are shown under the protocol navigation.

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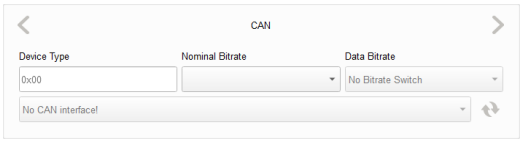
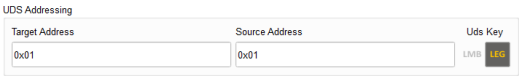
Configure CAN



- ► Enter the device type in hex format with a length of 1 byte "0x00" in the input field.
- ► Select nominal bit rate from drop-down list.
- ► Select bit rate for data from drop-down list.
- ► Select CAN interface from drop-down list.

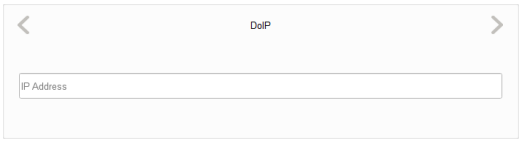
If the connected interface is not displayed:

- ► Refresh the list of available CAN interfaces by clicking on the refresh symbol.

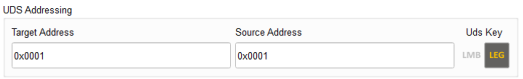


- ► Enter the target address in hex format with a length of 1 byte "0x00" in the input field.
- ► Enter the source Address in hex format with a length of 1 byte "0x00" in the input field.
- ► Select UDS key table.

Configure DoIP



- ► Enter the target IP address in the format "000.000.000.000" in the input field.



- ► Enter the target address in hex format with a length of 2 bytes "0x0000" in the input field.
- ► Enter the source address in hex format with a length of 2 bytes "0x0000" in the input field.
- ► Select UDS Key Table.

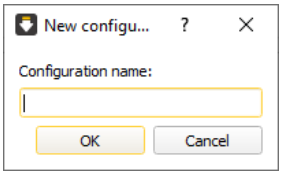
Configure Ethernet

- ► Enter the target IP address in the format "000.000.000.000" in the first input field.
- ► Enter the port for communication with the target in the format "00000" in the second input field.

Safe configuration

Configurations can be saved in the Liebherr MDCx Configurator.

- ► After defining all parameters, click the “Add Config” button on the right side of the configuration list.



- ► An input window for the name of the configuration opens. The new configuration is displayed in the configuration list under this name.
- ► Enter a name.
- ► Confirm with “OK”

Load configuration

- ► Select the desired configuration in the configuration list by clicking with the mouse.
- ► Click on the “Load Config” button on the right edge of the configuration list.
- ▷ The settings for “UDS Addressing” and “Interface” are applied according to the saved configuration.

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Delete configuration

► Select the configuration to be deleted from the list by clicking it with the mouse.
► Click the “Delete Config” button on the right margin of the configuration list.
▷ The configuration is removed from the configuration list.

Note

The supplied device configurations (e.g. MDCx) cannot be deleted.
These configurations are stored in the Windows registry in the key in HKEY_CURRENT_USER\SOFTWARE\Liebherr\DownloadTool\UserConfig.

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4.3.3 MDCx settings

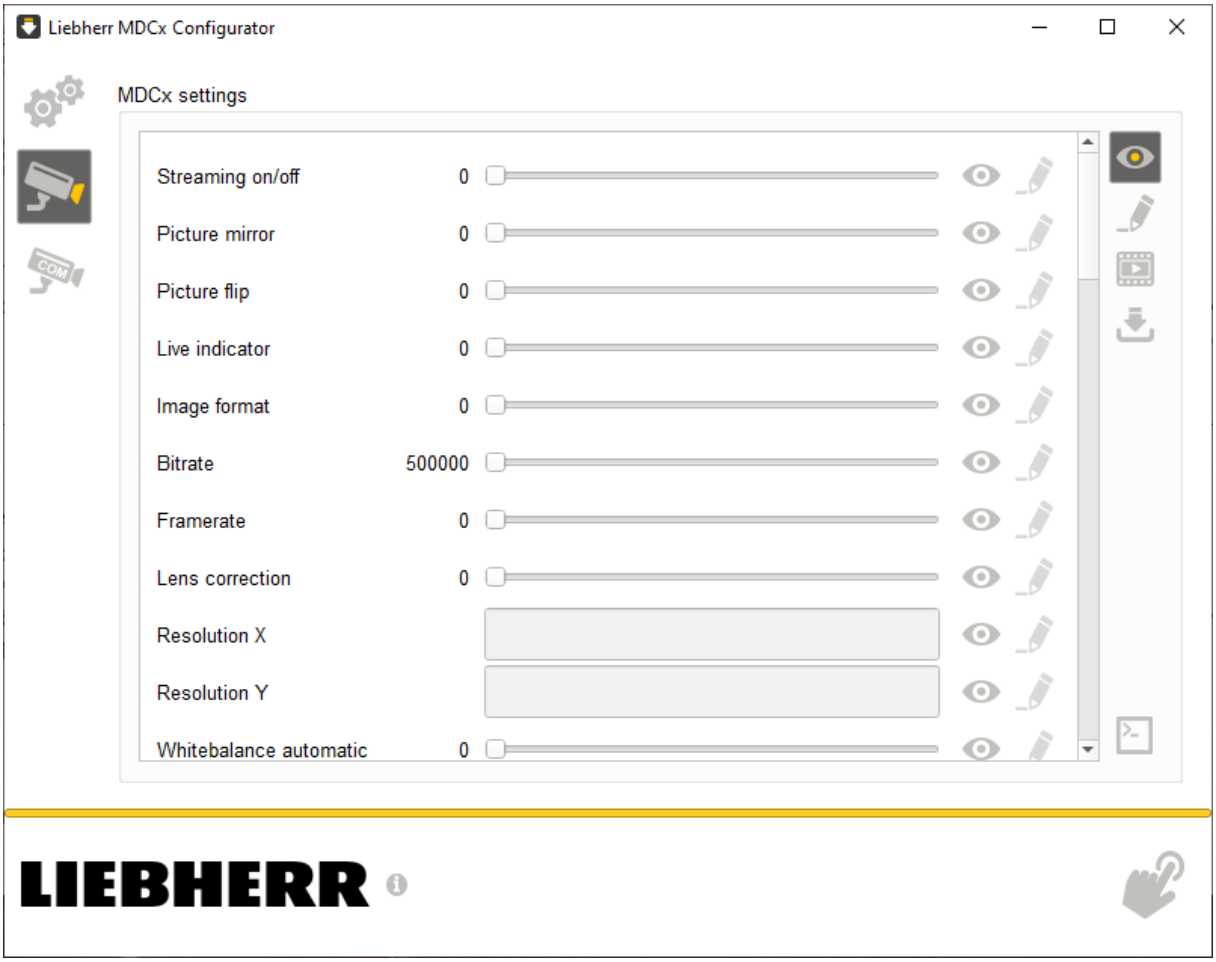

Figure 3: Camera control for MDCx

With this function, connected digital cameras can be configured and controlled.

The "MDCx settings" function provides the following operating modes:

Symbol	Meaning	Functional description
	Read mode	In this operating mode, the parameters and current settings of the camera functions can be read out from the camera.
	Write mode	In this operating mode, the parameters and camera functions can be set in the camera.
	Preview camera stream	This function opens a preview window with the live video stream of the addressed camera.
	Firmware update mode	In this operating mode, the firmware of the addressed camera can be updated.

Table 2: Operating modes of the "MDCx settings" function

Parameters and commands that can be used

The commands and parameters entered in the **cfg.ldt** configuration file are listed in the function parameters section. The following tables show examples of some of the commands and parameters implemented in the application. More detailed information can be found in the applicable operating instructions for the respective camera.

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Set read operating mode

► Click the "Switch to read mode" button to the right of the parameter list.

▷ The operating mode button is activated.

▷ The input fields in the parameter list are deactivated.

▷ The button for selecting the individual parameters in the parameter list is enabled.

Select parameters to read

► Select individual parameters by clicking on the read symbol next to the parameter.

▷ The parameter is selected for the read operation.

► Continue with Execute operation.

If all parameters and function statuses are to be read:

► Click again on the “Switch to read mode” button to the right of the parameter list.

▷ All parameters of the parameter list are selected for the read operation.

► Continue with Execute operation.

Note

A further mouse click on the “Switch to read mode” button to the right of the parameter list deletes the selection of parameters.

Set operating mode write

► Click “Switch to write mode” button to the right of the parameter list.

▷ The operating mode button is activated.

▷ The input fields of the parameter list are activated.

▷ The button for selecting the individual parameters in the parameter list is enabled.

Select parameters to write

► Select individual parameters by clicking on the “write” symbol next to the parameter or enter the desired content in the input field of the desired parameter.

▷ The parameter is selected for the write operation.

► Continue with Execute operation.

Preview of the camera stream

This command opens a window in which the video image of the selected camera is displayed.

► Click „Preview camera stream“ button to the right of the parameter list.

▷ The button is displayed activated as long as the window is open.

► Continue with Execute operation.

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Update the camera

This command is used to update the firmware of the addressed camera.

► Click the "Switch to firmware update mode" button to the right of the parameter list.

▷ The button is displayed activated.

▷ A text input field is displayed in the Function parameters area.

▷ The "Select file" button is displayed to the right of the input field.
► Click the "Select file" button.
▷ A file selection window opens.
► Select file.
► Confirm selection by clicking on the "Open" button.
► Continue with Execute operation

Execute operation

► Select operation und parameters. For write operations, fill in the input fields.

► Click “Read” button for read operations or the "Write" button for write operations in the lower right corner of the GUI.

▷ The selected parameters are read from or written to the connected device according to the set operating mode.

Note

If errors occurred during the write operation, the contents of the corresponding input fields are displayed in red letters. If write operations are successful, the field content is displayed in green.

Console input and console output

This command opens a window in which the commands and the feedback from the connected camera are displayed.

► Click „Show console input and output“ button to the right of the parameter list.

▷ The button is displayed activated as long as the window is open.

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4.3.4 MDCx profiles

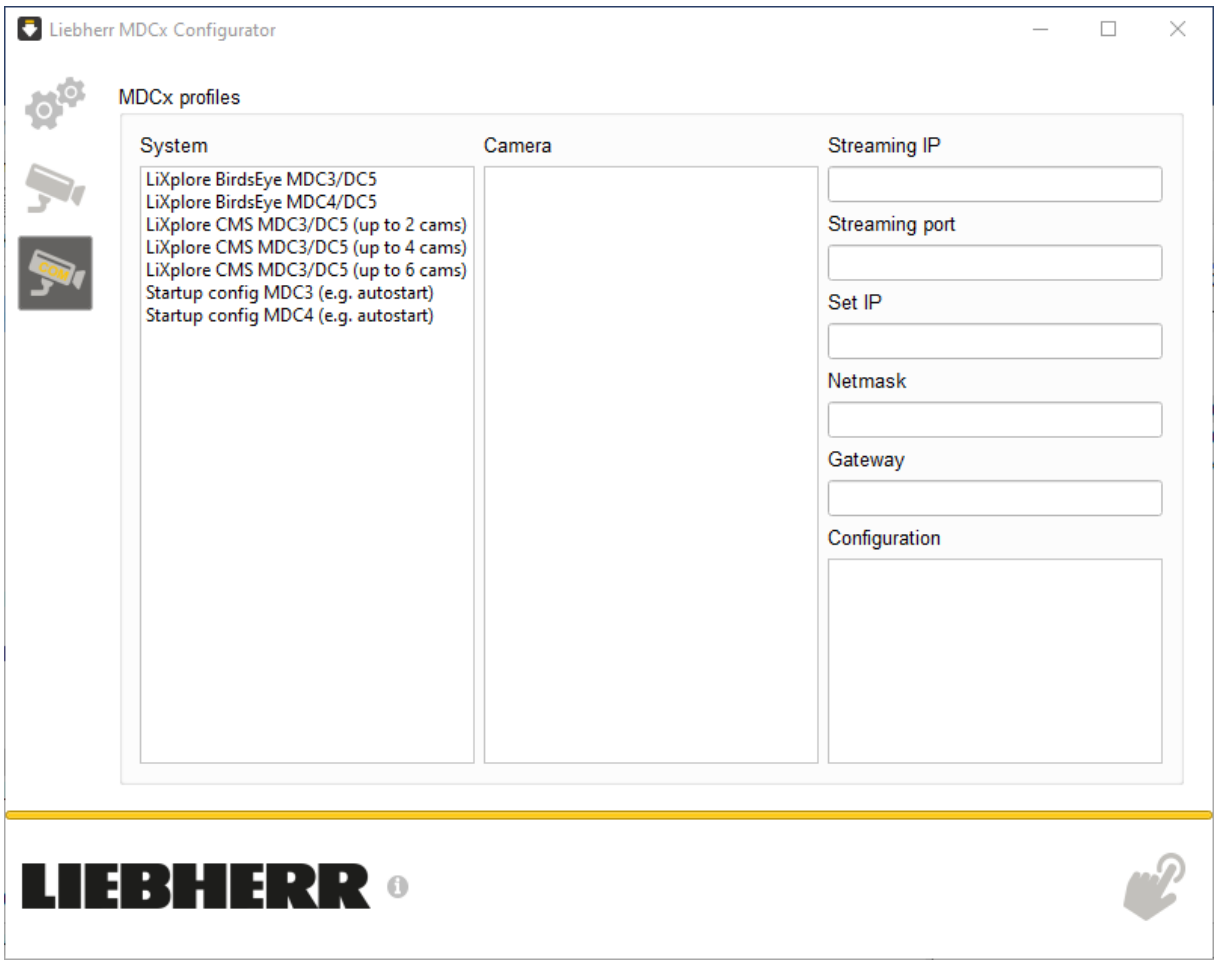

Figure 4: Predefined systems

This function can be used to configure digital cameras for various applications.

The applications and configuration sets are listed in alphabetical order in the System list box. These configuration sets are listed in the configuration file **cfg.ldt** in the [MDCxProfiles] group.

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Select system from the selection list

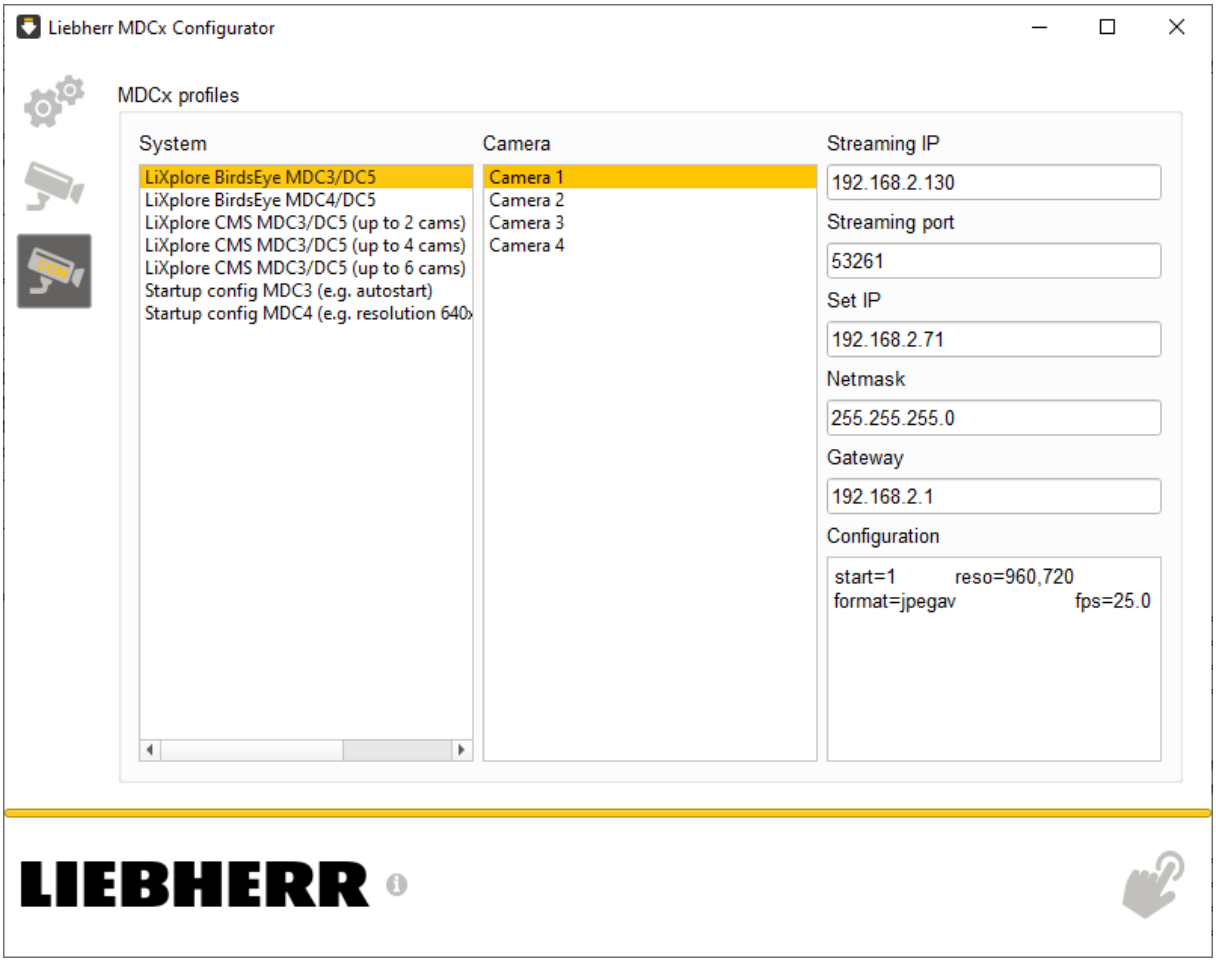

Figure 5: Predefined camera configurations for various systems

The "MDCx settings" function provides the following operating modes:

System	Profile description
LiXplore BirdsEye MDC3/DC5	360° surround view system consisting of four generation 3 cameras and a display device with special surround view software. Four camera configurations are available.
LiXplore BirdsEye MDC4/DC5	360° surround view system consisting of four generation 4 cameras and a display device with special surround view software. Four camera configurations are available.
LiXplore CMS MDC3/DC5 (up to 2 cams)	Camera monitor system consisting of up to two generation 3 cameras and a display device with software for camera control. Two camera configurations are available.
LiXplore CMS MDC3/DC5 (up to 4 cams)	Camera monitor system consisting of up to four generation 3 cameras and a display device with software for camera control. Four camera configurations are available.
LiXplore CMS MDC3/DC5 (up to 6 cams)	Camera monitor system consisting of up to six generation 3 cameras and a display device with camera control software. Six camera configurations are available.
Startup config MDC3 (e.g. autostart)	Modification of the start configuration of a Generation 3 camera with activated streaming.
Startup config MDC4 (e.g. resolution 640x480 & bitrate 20 Mbit/s)	Modification of the start configuration of a generation 4 camera with VGA resolution and bit rate 20 Mbit/s.

Table 3: Operating modes of the "MDCx settings" functions

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Select system

► Click on the desired system in the system list.
▷ The camera configurations stored in this system are displayed in the Camera list.
▷ The first camera is selected.
▷ The settings of the selected camera are displayed to the right of the Camera list.

Set the camera to the configuration

► Select system and camera in the respective lists.
► Click the "MDCx profiles " button in the bottom right-hand corner of the GUI.

▷ The selected configuration is transferred to the addressed camera.
▷ The camera reboots.

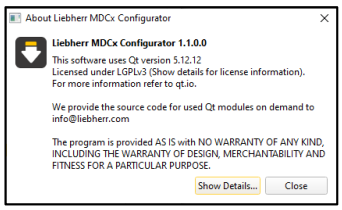
4.3.5 Application information

The current version of the Liebherr MDCx Configurator and the licence conditions can be accessed via the info button next to the Liebherr logo.

To open the version and licence information:

► Click on the info sign.

▷ A window opens with the current information on the version of the application and the licence information.
► A mouse click on the "Show Details..." button expands the information window to include the licence conditions of the open source software components used.



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5 Configuration file

5.1 Structure of the file

The **cfg.ldt** configuration file is structured in blocks. Lines beginning with a semicolon ";" are comments or explanations.

Syntax	Description
[Group]	Contents in square brackets are group names. [guiConfig]: Setting the name of the application and default selection of the active configuration. [PLC]: Commands and parameters of the MDCx settings function. [GST]: Settings and command line parameters for gstreamer to visualize the camera live stream. [MDCxProfiles]: Configuration sets for cameras of various system applications.
key=value	Contents before an equal sign are key or parameter designations in the products. Contents directly after an equal sign are the values of the preceding keys.

Table 4: Syntax

5.2 [guiConfig] section

The application title and the preselection of the interface configuration are set in this section.

Command	Effect
applicationTitle=Liebherr MDCx Configurator	The title of the application is set to Liebherr MDCx Configurator. 
defaultConfiguration=MDCx	The interface is set to the default configuration MDCx

Table 5: User interface settings

5.3 [SPS] section

The functions listed in the "MDCx settings" function are defined in this section.

The following design elements can be used to define the commands and parameters:

Element type	Syntax
Lineedit field	Pos=SPS command | label text | tooltip | access Example: 09=PICTURE_SIZE_X | Resolution X | | rw
Slider	Pos=SPS command | label text | tooltip | access | slider min | slider max | slider inc Example: 40=PICTURE_ROI_SIZE_X | ROI size X | | rw | 0 | 1920 | 16
Separator line	Pos=---

Table 6: Element types

Note

The following settings are possible as access types:

- ro: read only
- rw: read/write (read and write access)
- wo: write only (write access only)

5.4 [GST] section

The command line parameters for all configurable image formats are defined in this section. If the preview window is opened (see preview of the camera stream in chapter 4.3.3), the corresponding command line parameters are used to start the preview window.

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Note

When the preview window is started, the image format set in the camera is read out and the corresponding GST parameters are taken from the configuration file. The preview window is started with these parameters.

Further information and proven examples are contained in the cfg.ldt configuration file.

5.5 [MDCxProfiles] section

This section lists the camera configurations for various applications.

The configurations are to be specified as follows:

Syntax	Example
00=Configuration name	00=Startup config MDC3 (e.g. autostart) 01=LiXplore BirdsEye MDC3/DC5 02=LiXplore CMS MDC3/DC5 (up to 2 cams)

Table 7: List of configurations

Note

A separate section with the camera configurations must be created for each MDCxProfiles.

5.6 [Configuration name]

The camera configurations for the configuration name are defined in this section.

The configurations must be specified as follows:

Syntax	Pos=Camera display name | streaming ip | streaming port | set IP | netmask | gateway | config (optional)
Startup config MDC3 (e.g. autostart)	01=Camera 1 | 192.168.2.130 | 53260 | 192.168.2.70 | 255.255.255.0 | 192.168.2.1 | "start=1"
Startup config MDC4 (e.g. resolution 640x480 & bitrate 20 Mbit/s)	01=Camera 1 | 192.168.2.130 | 53260 | 192.168.2.70 | 255.255.255.0 | 192.168.2.1 | "reso=640,480\tbps=20000000"

Table 8: Camera configurations

Note

The examples only show the parameters that have been changed compared to the start configuration. All other camera configuration parameters remain unchanged.

The supplied cfg.ldt contains some sample configurations.

The configurable settings can be found in the relevant operating instructions for the camera.

6 Uninstalling the application

No special measures are required to uninstall the programme.

► Delete the directory and files in the installation directory (example: C:\LEG\Liebherr_MDCx_Configurator).

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7 Technical terms and abbreviations

Term or abbreviation	Meaning	Description or explanation
AC	article code	Number assigned to a Liebherr product for identification purposes.
Boot loader		Special software, also called a start-up program, which is loaded from a bootable medium by the firmware of a computer system and then executed.
CLI	command-line interface	Method for entering commands via the command line. The command to be executed is specified as text with all parameters.
FW	firmware	Ordered set of instructions and data stored in a way that is functionally independent of main storage, usually in a read-only storage.
GNU GPL	GNU General Public License	Licensing model of the Free Software Foundation for licensing free software.
GNU LGPL	GNU Lesser General Public License	Licensing model of the Free Software Foundation for licensing free software.
GUI	graphical user interface	Graphically designed visualisation of information and input options of a computer system.
LED	Liebherr-Electronics and Drives GmbH	Location in Germany for the development and production of customised electronic solutions.
OSI model	open systems interconnection model	Reference model for network protocols as a layered architecture (see ISO IEC 7498-1).
OSS	open source software	Software, which is distributed under an open source definition compliant licence which grants all the rights to use, study, change, and share the software in modified and unmodified form.
OSS component	open source software component	Function, sub-function or software module licensed under an open source licence.
SPF	specification index	Numerical value indicating the valid revision of a product specification.
UDS	unified diagnostic services	Diagnostic communication protocol in the control unit environment within automotive electronics. The protocol is specified in ISO 14229.

Table 9: Terms and abbreviations

8 Appendices

8.1 List of tables

8.2 List of figures

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