L-force *Loader*

Simple downloads
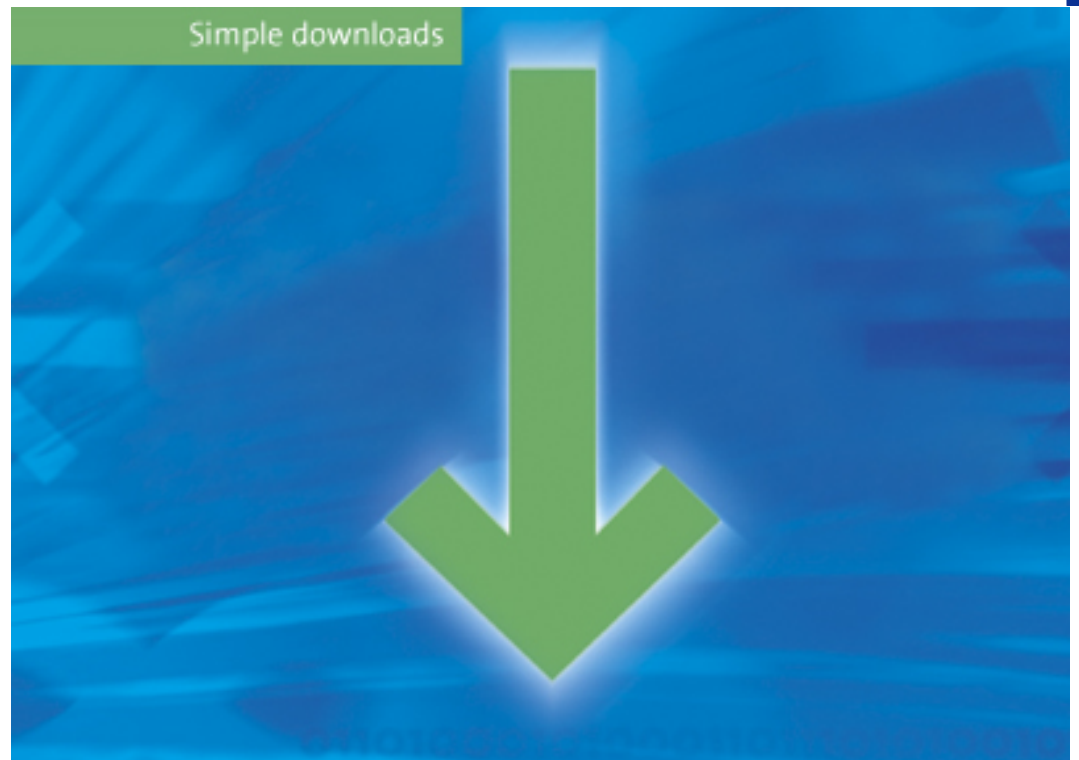
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This Manual is valid for the »L-force Loader« as of version 4.0

DMS 4.0 EN - 07/2007 - TD05/TD19

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Imprint

Lenze Drive Systems GmbH

Postfach 10 13 52, D-31763 Hameln, Germany

Phone: ++49 (0)5154 / 82-0

Fax: ++49 (0)5154 / 82-2111

E-Mail: Lenze@Lenze.de

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1 About this Manual

This Manual contains information about the »L-force Loader«.

The »L-force Loader« is a software to transfer PLC programs, parameter sets and application data from a PC to Lenze target systems.

Special features of the »L-force Loader«:

▶ Intuitive program operation via an easy-to-use PC user interface.

▶ Program control by means of script files for automated downloads to several target systems without the necessity of additional user inputs.

▶ Download of DDS binary files, application data (e.g. *.lc9 files created with Cam Designer or *.lc7 files created with GDC) and GDC parameter set files via the system bus (CAN) or LECOM.

▶ Download of L-force 9400 applications created with the Engineer via the system bus (CAN), Ethernet NRT or diagnostic adapter.

▶ Recording of all important events.

1.1 Conventions used

This Manual uses the following conventions to distinguish between different types of information:

Type of information	Writing	Examples/notes
Variable identifier	*italics*	By setting *bEnable* to TRUE...
Window		The *Message window*... / The *Options* dialog box...
Control element	**bold**	The **OK** button... / The **Copy** command... / The **Properties** tab... / The **Name** input field...
Sequence of menu commands		If several commands must be used in sequence to carry out a function, then the individual commands are separated by an arrow: Select **File➜Open** to...
Keyboard command	**<bold>**	Press **<F1>** to open the Online Help.
		If a command requires a combination of keys, a "+" is placed between the key symbols: With **<Shift>+<ESC>** you can...
Program listings	`Courier`	`IF var1 < var2 THEN`
Keyword	**`Courier bold`**	`    a = a + 1`
		`    END IF`
Hyperlink	<u>underlined</u>	Hyperlinks are highlighted references which are activated by means of a mouse click.
Step-by-step instructions		Step-by-step instructions are indicated by a pictograph.

1.2 **Layout of the safety instructions**

The following pictographs and signal words are used in this documentation to indicate dangers and important information:

Safety instructions

Structure of safety instructions:

⚠ **Pictograph and signal word!**

(characterise the type and severity of danger)

Note

(describes the danger and gives information about how to prevent dangerous situations)

Pictograph	Signal word	Meaning
⚡	Danger!	**Danger of personal injury through dangerous electrical voltage** Reference to an imminent danger that may result in death or serious personal injury if the corresponding measures are not taken.
⚠	Danger!	**Danger of personal injury through a general source of danger** Reference to an imminent danger that may result in death or serious personal injury if the corresponding measures are not taken.
STOP	Stop!	**Danger of property damage** Reference to a possible danger that may result in property damage if the corresponding measures are not taken.

Application notes

Pictograph	Signal word	Meaning
🛈	Note!	Important note to ensure trouble-free operation
💡	Tip!	Useful tip for simple handling

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2 System requirements

The following minimum requirements on hardware and software must be met in order to use the »L-force Loader«:

▶ Microsoft® Windows® 2000 (as of Service Pack 2) or Windows® XP

▶ Microsoft® Internet Explorer as of version 5.0

▶ IBM® compatible PC with Intel® Pentium® processor with at least 600 MHz

▶ 256 MB RAM

▶ 120 MB free hard disk capacity

▶ Pointer device (mouse, track ball, etc.)

▶ Free slots/interfaces according to the requirements of the fieldbus interface module used.

2.1 Supported target systems

The »L-force Loader« supports the following target systems:

Target system	as of version
8200 motec/vector	1.4
9300 hoist	0.4
9300 Servo PLC	0.2
9300 servo cam profiler	1.0
9300 servo position controller	1.0
9300 servo register controller	1.0
9300 servo inverter	1.0
9300 vector	1.0
9374 terminal extension	1.0
9400 StateLine / HighLine	1.0
Drive PLC	0.4
ECS axis controller	1.3
ECS power supply module	1.2
EthernetCAN 2180	1.0
I/O system	1.0
ModemCAN 2181	1.0
starttec	1.0

2.2 Connection with the target system

The communication with the target system (controller, Drive PLC, etc.) requires a fieldbus-specific interface module for the PC and the corresponding fieldbus modules for the target systems to be connected.

▶ For system bus (CAN) communication, Lenze offers the following interface modules for the PC:

Communication accessories	PC port
PC system bus adapter 2173 incl. connection cable and voltage supply adapter • for DIN keyboard connection (EMF2173IB) • for PS/2 keyboard connection (EMF2173IBV002) • for PS/2 keyboard connection with electrical isolation (EMF2173IBV003)	Parallel port (LPT port)
PC system bus adapter 2177 incl. connection cable (EMF2177IB)	USB (Universal Serial Bus)

🛈 **Note!**

- Detailed information on the PC system bus adapter can be found in the "CAN Communication Manual".
- Please read the documentation delivered together with the PC system bus adapter!

L-force 9400 Servo Drives

If devices of the "L-force 9400 Servo Drives" series are used, communication can also take place via the diagnostic interface X6 on the controller. For this purpose Lenze offers the following interface module for the PC:

Communication accessories	PC port
PC diagnostic adapter E94AZCUS incl. connection cables	USB (Universal Serial Bus)

3   Software installation

Double-click the file "Setup_L-force_Loader.exe" in Windows Explorer and follow the instructions of the installation program to install the »L-force Loader« on your computer!

Note!

With Windows 2000/XP the installation requires administrator rights!

4 User interface

⌨🖱 Select the menu item
Programs→Lenze→L-force Loader - 4.0→L-force Loader,
from the *start menu* to start the »L-force Loader« with user interface.

The user interface contains the following control and function elements:
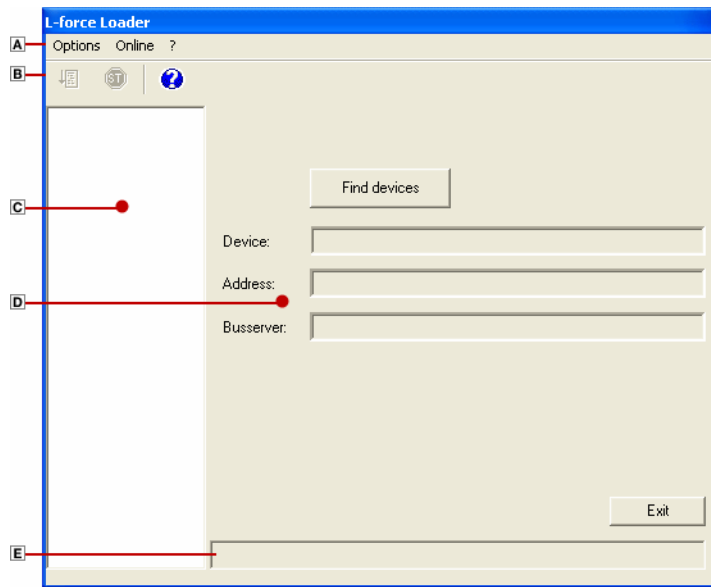
Ⓐ Menu bar   Ⓑ Toolbar   Ⓒ Function area   Ⓓ Dialog area   Ⓔ Status bar

💡 **Tip!**

The »L-force Loader« can also be script-controlled to automatically download data to several target systems without the necessity of additional user inputs. For more information, please refer to the chapter "Control via script files". (📖 29)

4.1 Language selection

It is possible to change the language for the menu, dialog and help texts of the user interface.

▶ You can choose between German, English and French.

⌨🖱 For changing to another language, select **Options→Language** and choose the desired language.

4.2   Menu bar

The *menu bar* is used to access the menu commands for the »L-force Loader«.

▶ A click on an item of the main menu opens the corresponding menu and lists the menu items contained in it.

▶ Click a menu item to execute the corresponding function.

   – Menu items which are displayed in light grey are currently deactivated because the execution of the corresponding function would not make any sense in the current program state.

"Options" menu

The **Options** menu provides commands for the configuration of the »L-force Loader«:

Command	Function
System bus configurator...	Starts the Lenze system bus configurator • Use the system bus configurator to easily configure the communication parameters of the Lenze PC system bus adapters connected to your PC. • For safety reasons, all »L-force Loader« functions/menu commands are deactivated while the system bus configurator is running. • For detailed information on the system bus configurator, please refer to the Online Help for the system bus configurator.
Diagnostics configurator...	Starts the Lenze diagnostics configurator • Use the diagnostics configurator to easily configure the communication parameters of the Lenze PC diagnostic adapters connected to your PC. • For safety reasons, all »L-force Loader« functions/menu commands are deactivated while the diagnostics configurator is running.
LECOM configurator...	Starts the Lenze LECOM configurator • For safety reasons, all »L-force Loader« functions/menu commands are deactivated while the LECOM configurator is running. • For detailed information on the LECOM configurator, please refer to the DriveServer documentation.
DriveServer configurator...	Starts the Lenze DriveServer configurator • For safety reasons, all »L-force Loader« functions/menu commands are deactivated while the DriveServer configurator is running. • For detailed information on the DriveServer configurator, please refer to the DriveServer documentation.
IP address...	Specifies the IP address • Only required for the "L-force 9400 Servo Drives" series if communication with the controller is to take place via Ethernet NRT.
Activation of safety scan	A safety scan is made before every action. • If this option is activated, a tick appears next to the menu command.
Activation of all notes	Repeated note display can be stopped by activating the **Do not display this note again** checkbox in the note dialog box. Use the command **Activation of all notes** to reset all settings made, i.e. all notes will be displayed again.
Language	Selection of the language for the user interface.

"Online" menu

The **Online** menu provides commands which can only be activated when the »L-force Loader« is in online mode:

Command	Function
PLC / application start	Starts the PLC program/application on the target system • Only with target systems with appropriate functionality (e.g. 9400 HighLine/StateLine, 9300 Servo PLC, Drive PLC).
PLC / application stop	Stops the PLC program/application on the target system • Only with target systems with appropriate functionality (e.g. 9400 HighLine/StateLine, 9300 Servo PLC, Drive PLC).
Controller enable	Enables the target system • Only with target systems supporting this functionality (e.g. 9400 HighLine/StateLine, 9300 Servo PLC, Drive PLC).
Controller inhibit	Inhibits the target system • Only with target systems supporting this functionality (e.g. 9400 HighLine/StateLine, 9300 Servo PLC, Drive PLC).

"?" menu

The **?** menu provides commands for the activation of the Online Help, the download of relevant pages from the Internet and the display of program information:

Command	Function
Help topics	Opens the Online Help for the »L-force Loader«
Web support (AKB)	Opens the corresponding topic areas of the Lenze *Application Knowledge Base* (AKB) on the Internet • Internet address (URL): http://www.Lenze.de/akb
Search in AKB	
Subscribe newsletter	
Software download	
Lenze homepage	Opens the Lenze homepage on the Internet • Internet address (URL): http://www.Lenze.de
About...	Displays information about the »L-force Loader« (e.g. version and copyright)

4.3 **Toolbar**

Via the icons of the *toolbar* you can directly execute some of the most frequently used menu commands without making a detour via the [Menu bar](#).

▶ Simply click an icon to activate the corresponding command.

Icon	Function
⬇▤	Starts the PLC program/application
⑤ⓣ	Stops the PLC program/application
❷	Displays help topics

🔆 **Tip!**

If you position the mouse pointer for a short time over an icon, a "tool tip" will be displayed with information about the corresponding function.

4.4 **Function area**

The function area shows all presently available functions in form of icons. The functions can be activated by a mouse click.

4.5 **Dialog area**

The dialog area displays input dialogs, buttons and text fields with additional information about the active function.

4.6 **Status bar**

The status bar indicates the communication status (online/offline) and the device address.

▶ For Lenze PLCs, the PLC program status is indicated as well.

▶ For L-force 9400 Servo Drives, the application status is indicated as well.

5 Operation

5.1 How to configure the communication settings

The Lenze DriveServer and the OPC bus server for the corresponding fieldbus are used to build up the connection with the target system.

> **Note!**
>
> For the configuration of the communication settings, the DriveServer must be closed.
>
> The DriveServer is default set to the OPC bus server for the system bus (CAN).
> - If you want to use a different OPC bus server for communication, use the DriveServer configurator to add this bus server to the DriveServer.

DriveServer

For the configuration of the DriveServer, the DriveServer configurator of the »L-force Loader« is used. The DriveServer configurator is activated via **Options→DriveServer configurator...**.

> **Tip!**
>
> For detailed information on the DriveServer, please refer to the DriveServer documentation.

OPC bus server for system bus (CAN)

For the configuration of the system bus (CAN) communication settings, the system bus configurator of the »L-force Loader« is used. The system bus configurator is activated via **Options→System bus configurator...**.

> **Tip!**
>
> The diagnostics function of the system bus configurator can, for instance, be used to check that the PC system bus adapter is working properly.
>
> For detailed information on the system bus configurator, please refer to the CAN Communication Manual and to the Online Help of the system bus configurator.

OPC bus server for LECOM

Instead of using the system bus (CAN), you can also communicate with the target system via LECOM. The corresponding communication settings are configured with the LECOM configurator of the »L-force Loader«. The LECOM configurator is activated via **Options→LECOM configurator...**.

▶ Example: Configuring a point-to-point connection via LECOM (◻ 16)

> **Note!**
>
> LECOM does not support the parameter set transfer variant "Replacement device".

> **Tip!**
>
> For communication via the serial interface COM1, use the configuration file "Default_COM1.lccfg" which is set by default in the LECOM configurator.
>
> For detailed information on the LECOM configurator, please refer to the DriveServer documentation.

Use of the diagnostics interface or Ethernet NRT on L-force 9400 Servo Drives

Instead of using the system bus (CAN), you can also communicate with the controllers of the "L-force 9400 Servo Drives" series via the diagnostics interface X6 or Ethernet NRT.

▶ The communication settings for the diagnostic adapter are configured with the diagnostics configurator of the »L-force Loader«. The diagnostics configurator is activated via **Options→Diagnostics configurator...**.

▶ If you want to use Ethernet NRT for communication, open the *IP address* dialog box via **Options→IP address...** and enter the IP address of the controller.

Use of other OPC bus servers

For communication with the target system, you can also install other bus servers for the DriveServer. For detailed information on this topic, please refer to the DriveServer documentation.

> **Note!**
>
> Please note that some fieldbuses or OPC bus servers do not support all download options. Programs and *.lc9 files can, for instance, only be downloaded with the bus server for the Lenze OPC system bus or other CANopen bus servers.

5.1.1 Example: Configuring a point-to-point connection via LECOM

> **Note!**
>
> The configuration described below only has to be carried out once.

How to configure a point-to-point connection via LECOM:

1. Select **Programs→Lenze→L-force Loader - 4.0→L-force Loader** from the *Start menu* to start the »L-force Loader«.

   In the »L-force Loader«:

2. Select **Options→DriveServer configurator** to open the »DriveServer configurator«.

   In the »DriveServer configurator«:

3. Select **File→Connect** to build up a connection to the selected DriveServer.
   - Wait until the *Please wait* dialog disappears and the connection to the DriveServer has been built up.

4. Select **Configuration→Bus server** to open the *Bus server configuration* dialog box.
   - The right list field lists all bus servers which have been assigned to the DriveServer.
   - To remove an assignment, select the corresponding bus server from the right list field and click the **Delete** button.

5. Click **Refresh** to list all bus servers available on the selected PC in the left list field.

6. For LECOM, select "Lenze OPC LECOM server" from the left list field and click **Add** to assign this bus server to the DriveServer.
   - If necessary, repeat the above steps to assign further bus servers to the Drive Server.

7. Click **OK** to accept the settings and close the *Bus server configuration* dialog box.
   - The bus servers assigned to the DriveServer will be listed in the name area under the "Online" element.

8. Select **File→Disconnect** to end the connection to the selected DriveServer.

9. Select **File→Exit** to exit the »DriveServer configurator«.

In the »L-force Loader«:

10. Select **Options→LECOM configurator** to open the »LECOM configurator«.

In the »LECOM configurator«:

11. Click **OK** to confirm the *Lenze OPC server LECOM* info dialog box.

- The configuration saved last will be loaded automatically.

12. Select the configuration entry for the interface (COMx) from the tree/list on the left.

- Check the interface settings in the **Communication port** tab (particularly, COM number and baud rate) and adjust the settings, if necessary.

- For a point-to-point connection via LECOM, mark the **Scan at the server's start** option with a tick.

13. Select **File→Save** to save the configuration.

14. Select **File→Exit** to exit the »LECOM configurator«.

The configuration is now complete and you can start searching for connected devices in the »L-force Loader«.

5.2 **How to select a target system**

For selecting a target system, you can perform an automatic search for devices connected to the bus system.

How to perform an automatic search:

1. Click **Find devices** to find the devices connected to the bus system.
   - The progress of scanning will be indicated by a progress bar.
   - At the end of scanning, the *Select target system* dialog box will appear:
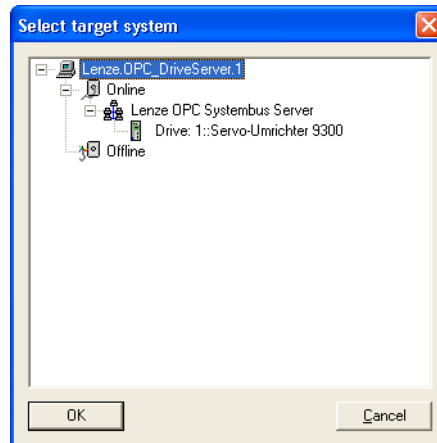
2. Select the desired target system from the tree.

3. Click **OK** to confirm your selection.
   - The selection is accepted and the dialog box is closed.
   - The selected target system is displayed in the *dialog area*:
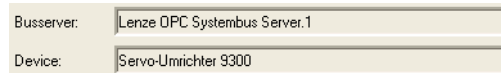
Next steps:

▸ How to build up a connection with the target system (📖 19)

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5.3   **How to build up a connection with the target system**

Click **Log in** in the *function area* to build up a connection to the selected target system.

▶ If the connection has been established successfully, the »L-force Loader« changes from offline to online mode and the *status bar* indicates the communication status "Online" and the device address.

— For Lenze PLCs, the PLC program status is indicated as well.

— For L-force 9400 Servo Drives, the application status is indicated as well.

▶ If question marks (???) appear in the *dialog area* after log in, the target system is not supported by the »L-force Loader«.

▶ If it is not possible to build up a connection, an error message with an error number will be displayed. A list of all error numbers and their meanings can be found in the appendix. ▶ Error numbers, causes & remedies (🕮 36)

Next steps:

▶ How to select files for the download (🕮 20)

5.4 **How to select files for the download**

After you have established a connection to the target system and the »L-force Loader« is in online mode, you can select the files to be downloaded to the target system.

A difference is made between:

▶ DDS binary files created with the Drive PLC Developer Studio

▶ Application data created e.g. with the Cam Designer

▶ GDC parameter set files created with Global Drive Control

▶ L-force 9400 applications created with the L-force Engineer

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Note!

The target system determines which files can be selected (opened) for the download in the »L-force Loader«.

• The function "Open DDS binary file" is, for instance, only available if the target system has PLC functionality (e.g. 9300 Servo PLC). ▶ How to open a DDS binary file (□ 21)

• The function "Open 9400 application" is, however, only available for controllers of the "L-force 9400 Servo Drives" series. ▶ How to open a 9400 application (□ 24)

After opening a file, click **Download...** to download the file to the target system or (depending on the target system) open further files to be downloaded and download them one after another to the target system by clicking **Download...**.

▶ Detailed information about the download can be found in the chapter "How to download data". (□ 25)

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5.4.1 How to open a DDS binary file

If the target system has PLC functionality (e.g. 9300 Servo PLC and Drive PLC), this function can be used to open a DDS binary file for the download.

▶ All binary formats as of Drive PLC Developer Studio (DDS) version 1.0 are supported.

How to open a DDS binary file...

1. Select **DDS binary file...** in the *function area*.

2. Select the desired file in the *Open DDS binary file* dialog box.

3. Click **OK** to confirm your selection.
   - The selection is accepted and the dialog box is closed.

▶ If the binary file could be opened properly,
   - the **Close DDS binary file** function will be available instead of the **DDS binary file...** function. Use this function to close the binary file.
   - the **Download...** function will be provided to download the file(s) to the target system.
   - the dialog area will display information about the opened binary file in the **Binary file** tab.

▶ If it is not possible to open the binary file properly, an error message with an error number will be displayed. ▶ Error numbers, causes & remedies (🕮 36)

Next steps:

▶ How to open application data (🕮 22) / ▶ How to open a GDC parameter set file (🕮 23)

or

▶ How to download data (🕮 25)

5.4.2 **How to open application data**

If the target system supports the download of application data, click **Application data...** to open an application data file for the download.

▶ After this, you can download *.lc9 files containing motion profiles & cam data created with Cam Designer or *.lc7 files created with GDC to the target system.

▶ Apart from *.lc9-/*.lc7 files you can open any other files for the download, provided that they have the file header specified by Lenze.

– Detailed information about the structure of the file header can be found in the Manual for the 9300 Servo PLC (6.x), chapter "Appendix / Memory / Download of any data".

How to open an application data file...

1. Select **Application data...** in the *function area*.

2. Select the desired file in the *Open application data* dialog box.

3. Click **OK** to confirm your selection.

• The selection is accepted and the dialog box is closed.

▶ If the application data could be opened properly,

– the **Close application data** function will be available instead of the **Application data...** function. Use this function to close the application data.

– the **Download...** function will be provided to download the file(s) to the target system.

– the *dialog area* will display information about the opened application data in the **Application data** tab.

▶ If it is not possible to open the application data properly, an error message with an error number will be displayed. ▶ Error numbers, causes & remedies (📖 36)

Next steps:

or

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5.4.3 How to open a GDC parameter set file

Click **GDC parameter set file...** to open a parameter set file created with Global Drive Control (GDC) for the download.

How to open a GDC parameter set file...

1. Select the **GDC parameter set file...** function in the *function area*.

2. Select the desired file in the *Open GDC parameter set file* dialog box.

3. Click **OK** to confirm your selection.
   - The selection is accepted and the dialog box is closed.

▶ If the parameter set file could be opened properly,
  – the **Close GDC parameter set file** function will be available instead of the **GDC parameter set file...** function. Use this function to close the parameter set file.
  – the **Download...** function will be provided to download the file(s) to the target system.
  – the *dialog area* will display information about the opened parameter set file in the **Parameter set file** tab.

▶ If it is not possible to open the parameter set file properly, an error message with an error number will be displayed. ▶ Error numbers, causes & remedies (📖 36)

Next steps:

▶ How to open a DDS binary file (📖 21) / ▶ How to open application data (📖 22)

or

▶ How to download data (📖 25)

5.4.4 How to open a 9400 application

Click **Open 9400 application** to open an application created for the "L-force 9400 Servo Drives" series with the L-force Engineer for the download.

> **i** **Note!**
>
> For the »L-force Loader«, the 9400 application to be opened must be present in the form of an L-force Loader file (*.lfl). This file contains the application data required in a compressed manner.

Tip!

If you want to create an L-force Loader file (*.lfl) with the Engineer, select **Export L-force Loader file...** in the *project view* of the controller's context menu.

- File name and target directory of the L-force Loader file (*.lfl) to be output can be freely selected.

How to open an L-force 9400 application...

1. Select the **Open 9400 application** function in the *function area*.
2. Select the desired L-force Loader file (*.lfl) in the *Open 9400 application* dialog box.
3. Click **OK** to confirm your selection.
   - The selection is accepted and the dialog box is closed.

▶ If the 9400 application could be opened properly,
   - the **Close 9400 application** function will be available instead of the **Open 9400 application** function. Use this function to close the 9400 application.
   - the **Download...** function will be provided to download the file(s) to the target system.
   - the *dialog area* will display information about the opened application in the **9400 application** tab.

▶ If it is not possible to open the 9400 application properly, an error message with an error number is displayed. ▶ Error numbers, causes & remedies (🕮 36)

Next steps:

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5.5 How to download data

As long as at least one file has been opened for the download, the **Download...** function will be available in online mode. Use this function to download the selected file(s).

> **Note!**
>
> After selecting the **Download...** function, the »L-force Loader« changes from online mode to the so-called download mode. For safety reasons, the program cannot be closed in download mode.
>
> Please note that the controller must be inhibited in the target system for the download.
> - For target systems with PLC functionality, the PLC program must additionally be stopped.
> - For controllers of the "L-force 9400 Servo Drives" series the application must be stopped as well.
>
> If these requirements are not met, a corresponding message will be indicated.

Download sequence

For the download, the following sequence applies:

1. DDS binary files will always be downloaded first.

2. Application data will be downloaded next.

3. GDC parameter set files will be downloaded last.

This sequence does not apply to the controllers of the "L-force 9400 Servo Drives" series since to them only L-force 9400 applications can be downloaded.

Before downloading a file

The results of the safety checks carried out before a download are listed in a log in the dialog area.

▶ The download can only be carried out if all safety checks have been passed successfully.

▶ If one of the safety checks is not passed, an error number will be displayed in the log.

▶ Before the download of DDS binary files and application data, it is also checked whether the data in the target system is newer than or identical with the data to be downloaded. If necessary, a corresponding message will be indicated and you can select if the download shall be continued or stopped.

▶ Parameter sets can be transferred in two different ways.
  ▶ Parameter set transfer (⌑ 27)

During the download

The name of the file being downloaded is displayed in the status bar. The progress of the download is indicated in form of a bar.

▶ If an error occurs during the download, an error message with an error number will be displayed. ▶ Error numbers, causes & remedies (⌑ 36)

After a successful download

After the download of a DDS binary file or an L-force 9400 application, a dialog box appears in which you are asked whether the PLC program or the application is to be started in the target system.

▶ If the **Always start PLC program/application** checkbox of this dialog box is ticked, the PLC program or application will always be started after a download and the query will not be displayed. The option can be reset via **Options→Activation of all notes**.

The number of transferred bytes and parameters and the check test results are listed in a log.

▶ Click **Next >>** to download the next file or **Cancel** to stop the download process and change back to the online mode.

After all downloads have been completed successfully, click **Main menu >>** to change from download mode to online mode.

After a faulty download

The number of transferred bytes and parameters and an error number are listed in a log. ▶ Error numbers, causes & remedies (🕮 36)

▶ Click **Main menu >>** to change from download mode to online mode and close the program or start a new download.

> ⓘ **Note!**
>
> Please note that the data transferred to the target system will be invalid if the download of a file has not been completed successfully!

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5.5.1   **Parameter set transfer**

The function area provides the following functions for the download of GDC parameter set files:

Command	Function
Duplication of parameter set	At the parameter set transfer, some codes of the parameter set are not transferred to the target system. These are, among others: • C0009 - AIF device address • C0125 - AIF baud rate • C0058 - Rotor position All codes not transferred to the target system are listed in a note dialog before the parameter set transfer starts.
Replacement device	Codes C0009, C0125 and C0058 are also transferred to the target system. **Note:** LECOM does not support the "Replacement device" function!

Assignment of device descriptions

The GDC parameter set file includes the codes to be transferred with the corresponding initialisation values. The parameter set transfer, however, requires additional information about the code type. This information is generated from the corresponding device description.

The »L-force Loader« tries to assign these device descriptions automatically by searching the directory which has been the source for the parameter set file for the corresponding device description.

▶ If a directory does not include the corresponding device description, the search will be continued in the directories configured via the DriveServer menu commands **Configuration→PDB paths...**.

5.6 **How to end the connection with the target system**

After you have logged in on the target system and changed from offline to online mode, the **Log out** function will be indicated instead of the **Log in** function. Use this function to end the online connection to the target system.

After you have logged out from the target system, the »L-force Loader« will be in offline mode again and you can build up a connection to another target system.

5.7 **How to exit the L-force Loader**

Click **Exit** to exit the »L-force Loader«.

> **Note!**
>
> For safety reasons, the program cannot be exited while downloading data to a target system!

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L-force Loader
Control via script files
Structure of the script file

6 Control via script files

Data can be automatically downloaded to several target systems if the »L-force Loader«
has been started in the so-called batch mode.

▶ The batch mode processes a script without the need of additional user inputs.

▶ All »L-force Loader« activities including possibly occurring error messages are listed in
a log file.

🛈 **Note!**

Please note the following special features in batch mode:
- "Note" and "information" messages are not displayed.
- The target system inhibits the controller automatically!
- A PLC program running on the target system is stopped automatically!

6.1 Structure of the script file

Automatic processing is only possible with a script file which determines the actions to be
carried out.

Script files can be created with any ASCII text editor (e.g. Notepad). A script file is divided
into sections. Different keys can be entered for the sections. Therefore they are very similar
to typical Windows INI files.

▶ Sections are put into square brackets. The following lines list the keys for a specific
section.

▶ A key consists of a key name followed by an equal sign and a key value.
  – Comments can be added, the comment must, however, be separated from the key
  value by a semicolon.
  – It is not possible to enter more than one key per line.
  – Example:

```
ShowProcessing=1     ;displays progress window
```

⚠ **Warning!**

If the machine includes several axes, every axis is started directly after download
if **StartAfterDownload = 1** is set. This can lead to dangerous situations!

 Tip!

The script is not tested for correctness before it is being processed, i.e. script processing does not stop before an error occurs. The error can be analysed and eliminated using the log file.

Communication settings - [COMMUNICATION] section

Key	Parameter
Baudrate	Baud rate of the system bus in kBaud. • The baud rate selection in the script is optional. • If the baud rate is not defined in the script, the value set in the system bus configurator will be used.

General settings - [COMMON] section

Key	Parameter
NumberOfDevices	Number of the target systems to be programmed (max. 63).
ShowProcessing	Status window display: 0 = Status window not displayed (standard setting). 1 = Status window displayed.
MaxNumberOfErrors	*The latest version no longer supports this entry and ignores it, if necessary (e.g. in older script files).*
ExitAfterDownload	Automatic stop of »L-force Loader« after the script has been processed: 0 = »L-force Loader« does not stop after processing is completed (standard setting). 1 = »L-force Loader« stops after processing is completed.

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L-force Loader
Control via script files
Structure of the script file

Target system-dependent settings - [DEVICE...] sections

Every target system must have a [DEVICE???] section. The question marks must be replaced by consecutive numbers (001 ... *NumberOfDevices*).

▶ If you have defined the key **NumberOfDevices=3** in the [COMMON] section, the following three sections must be available:
[DEVICE001], [DEVICE002], [DEVICE003].

▶ The target systems are processed subsequently, starting with [DEVICE001].

The following settings can be made for every section:

Key	Parameter
NodeAddress	Designation of the bus server and address of the target system (see following examples). • The address is displayed in the *dialog area* in the **Busserver** field.
	Example 1 - communication via system bus • In the following example, the target system has the CAN node address "11". • Check also key "SDO"!
	`NodeAdress=Lenze OPC Systembus Server.11`
	Example 2 - communication via LECOM • In the following example, the target system has the LECOM node address "5".
	`NodeAdress=Lenze OPC Lecom Server.1-5`
	Example 3 - communication with L-force 9400 Servo Drives via diagnostic adapter If <u>only one</u> diagnostic adapter is connected to the PC, the default address "0" is to be indicated:
	`NodeAdress=Lenze OPC Diagnostics Server.0`
	If <u>several</u> diagnostic adapters are connected to the PC, unambiguous addressing requires the indication of the diagnostic adapter's serial number. • The serial number (S/N) is printed on the diagnostic adapter. • The serial number can also be displayed in the diagnostics configurator. For this purpose, select the diagnostic adapter in the configurator and click **Diagnostics** on the **Common** tab. • In the following example, the diagnostic adapter has the serial number "00001628".
	`NodeAdress=Lenze OPC Diagnostics Server.1-1628`
	Example 4 - communication with 9400 Servo Drives via Ethernet NRT • In the following example, the OPC Ethernet server has the default address "1". • The IP address is specified with the "IP" key.
	`NodeAddress=Lenze OPC Ethernet Server.1`
IP	IP address • Only required for communication with 9400 Servo Drives via Ethernet NRT. • The dots of the IP address must be replaced by underline characters. Example:
	`IP=172_31_201_38`
SDO	Parameter channel (1 or 2) for communication. • Only required for communication via system bus (CAN). • For a better performance, select the same parameter channel for all devices in the script file. • If "0" is set, there is no division into channels and the entire node address range is accepted.

L-force Loader
Control via script files
Structure of the script file

Key	Parameter
BinFile	Path and file name of the DDS binary file for the download. • Not indicated for target systems without PLC functionality. • File indication is optional (only indicated files will be transferred to the target system).
AddDataFile	Path and file name of the application data for the download. • Not indicated for target systems which do not support the download of application data. • File indication is optional (only indicated files will be transferred to the target system).
ParameterSetFile	Path and file name of the GDC parameter set file for the download. • File indication is optional (only indicated files will be transferred to the target system).
ApplicationFileSet	Path and file name of the L-force Loader file (*.lfl) for the download. • Only required for controllers of the "L-force 9400 Servo Drives" series.
DuplicateParameterSet	Determines whether a parameter set is to be duplicated or whether the target system is a replacement device: 0 = Target system is a replacement device (standard setting). 1 = Parameter set is duplicated. **Note:** • LECOM does not support the "Replacement device" function! • This key is not evaluated for controllers of the "L-force 9400 Servo Drives" series. Here the decision about which parameters are to be transferred is already made in the Engineer at the export of the download data.
StartAfterDownload	Determines whether the PLC program/L-force 9400 application is to be started after download and parameter set transfer have been completed: 0 = PLC program/application not started (standard setting). 1 = PLC program/application started.

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L-force Loader
Control via script files
Example of a script file

6.2 Example of a script file

The following example shows a script file for two target systems:

```
[COMMUNICATION]
Baudrate=500             ; setting optional

[COMMON]
NumberOfDevices=2

ShowProcessing=1         ; 0 = no progress window
                         ; 1 = displays progress window

ExitAfterDownload=0      ; 0 = L-force Loader will not exit
                         ; 1 = L-force Loader will exit after job is done

[DEVICE001]
NodeAddress=Lenze OPC Systembus Server.6
SDO=1
BinFile=D:\Projects\ServoPLC10.BIN
AddDataFile=D:\Projects\CamData10.lc9
ParameterSetFile=D:\Projects\ParSet10.GDC

DuplicateParameterSet=0  ; 0 = to replace a device
                         ; 1 = to duplicate a device

StartAfterDownload=1     ; 0 = plc program will not start
                         ; 1 = plc program will start
                         ;     after download

[DEVICE002]
NodeAddress=Lenze OPC Lecom Server.1-1
BinFile=                 ; no program transfer
AddDataFile=
ParameterSetFile=D:\Projects\ParSet14.GDC
DuplicateParameterSet=1
StartAfterDownload=0
```

6.3 Syntax of the command line call

Use the following syntax to start the »L-force Loader« in batch mode:

```
Lforce_Loader.exe /batch script file [log file]
```

▶ The **/batch** parameter determines that all background program functions will be script-controlled.

▶ The **script file** parameter indicates the script file to be used.
  – It is possible to use absolute and relative path names. A relative path always refers to the current directory.

▶ The **log file** parameter is optional. It contains the name of the log file in which all activities and possibly occurring error messages will be recorded. ▶ Log files (📖 40)
  – If you do not enter a path for the log file, the log file will be saved in the same directory as the script file.
  – If you skip the **log file** parameter, L-force Loader does not create a log file.

Example:

```
Lforce_Loader.exe /batch MyScript.cmd MyLogfile.txt
```

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L-force Loader
Control via script files
Batch mode commands

6.4   Batch mode commands

After the »L-force Loader« has been started in batch mode, the task bar in the info area displays the following icon:

▶ Right-click the icon to open a pop-up menu which provides the following commands:

Menu command	Function
Indicate processing	Shows status window providing information about the progress of script processing. • The status window corresponds to the log file except for the "Id" column. • Activated options are marked with a tick in front of the menu command.
About...	Displays information about the »L-force Loader« (e.g. version and copyright).
Close application	Closes the »L-force Loader«. • This command is not available in download mode.
Cancel	Stops download. • This command is only available in download mode.

Tip!

If you position the mouse pointer for a short time over the icon in the task bar, you will get information about the program status (application name, currently processed target system, number of errors, name of the file currently transferred) in form of a tool tip.

The icon in the task bar is animated as long as data is downloaded.

7 Appendix

7.1 Error numbers, causes & remedies

Error number	Cause	Remedy
0001h ... BFFFh	The Online Help for the system bus configurator provides information about these error numbers.	
C000h	Error while opening/closing a file.	Close the program and restart it. If the problem still occurs, check the path and the file name of the file causing the error.
C001h	Internal program error (invalid handling).	Restart the program. If the problem still occurs, contact the Lenze Hotline.
C100h	Error while reading the GDC parameter set file.	Try to reload the file. If the problem still occurs, the GDC parameter set file is not valid. Create a new file with GDC.
Faulty GDC parameter set file:		
C101h	Error in section "ParamSet".	Create a new GDC parameter set file with GDC.
C102h	Section "ParamSet" is missing.	
C103h	UserInfo cannot be read.	
C104h	PDB-ID cannot be read.	
C105h	Target system name cannot be read.	
C106h	Variable version cannot be read.	
C200h	A code specified in the parameter set file cannot be found in the device description.	If the device description has been assigned manually, ensure that the device description corresponds to the parameter set file.
Faulty GDC device description:		
C201h	Error in section "DefaultParamTypes".	If the device description has been created with DDS, create a new file. If the problem still occurs, contact the Lenze Hotline.
C202h	Section "ParamSet" is missing.	
C203h	PDB cannot be read.	
C204h	PDB-ID cannot be read.	
C205h	Name of ParamSet cannot be read.	
C206h	SWID_B cannot be read.	
C207h	Name of ParamSet is unknown.	

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Error number	Cause	Remedy
C300h	Error while downloading the DDS binary file.	Repeat the download. If the problem still occurs, contact the Lenze Hotline.
C301h	The target system found on the bus does not correspond to the target system for which the DDS binary file has been created.	Check the device address or select a different DDS binary file.
C302h	The project on the target system is a newer version than the project to be loaded.	
C303h	Downloading of the DDS binary file has been cancelled.	Repeat the download. If the problem still occurs, contact the Lenze Hotline.
C304h	Internal program error (PLC program buffer cannot be created.)	Restart the program. If the problem still occurs, contact the Lenze Hotline.
C400h	The device description assigned to the GDC parameter set file cannot be found.	Check the settings for the GDC search path in the initialisation file (key "SearchPathPDB"). If the problem still occurs, contact the person who created the GDC parameter set file.
C401h	Internal program error. (Transfer list not yet created.)	Restart the program. If the problem still occurs, contact the Lenze Hotline.
C402h	The maximum permissible number of errors has been exceeded during the parameter transfer.	Repeat the parameter transfer. If necessary, increase the number of permissible errors in the initialisation file (key "MaxTransferErrors").
C403h	The preparations for the parameter transfer have failed.	Restart the program. If the problem still occurs, contact the Lenze Hotline.
C404h	The device description does not correspond to the target system found on the bus.	Check the device address. If the device description has been loaded manually, select a different device description. Otherwise, select a different GDC parameter set file.
C405h	Internal program error. (Transfer list cannot be created.)	Restart the program. If the problem still occurs, contact the Lenze Hotline.
C406h	The "pdb.ini" file cannot be read.	Check that the "pdb.ini" file is in the »L-force Loader« program directory. If you cannot find it in the directory, reinstall the »L-force Loader«.
C407h	The GDC parameter set file has been created for a newer device version than that found on the bus.	Create a new GDC parameter set file for the device version present on the bus.
C500h	Faulty script file (communication parameters cannot be read).	Check the script file, especially the [Communication] section.
C501h	Error while creating the log file.	Check the log file name entered in the command line and try again.
C502h	Error while opening the script file.	Check the script file name entered in the command line and try again.
C503h	Error while opening the DDS binary file.	Check the name of the target system causing the error (e.g. "DEVICE001") in the log file and the specifications in the script file.
C504h	Error while opening the GDC parameter set file.	
C600h	No connection to the target system.	Check the wiring between PC and target system. Restart the program.
C601h	The target system cannot be identified.	Contact the Lenze Hotline.

Error number	Cause	Remedy
C602h	Error while identifying the FIF. (Product code cannot be read.)	Check the communication parameters. If the problem still occurs, contact the Lenze Hotline.
C603h	Error while identifying the FIF. (ID cannot be read.)	
C604h	Error while copying the application data.	Check the name of the target system causing the error (e.g. "DEVICE001") in the log file and the specifications in the script file.
C605h	Application data of file and target system is identical.	Only status message, no remedy required.
C606h	Application data cannot be transferred.	Repeat the download. If the problem still occurs, contact the Lenze Hotline.
C607h	Error while opening the application data.	Check the name of the target system causing the error (e.g. "DEVICE001") in the log file and the specifications in the script file.
C608h	No target system selected.	Check whether a target system has been selected.
C60Ah	Internal program error: OPC item cannot be created.	Restart »L-force Loader«. If necessary, restart PC.
C60Bh	Internal program error: OPC item cannot be read.	Restart »L-force Loader«. Check whether the target system can be addressed.
C60Ch	Internal program error: OPC item cannot be written.	Reinstall »L-force Loader«. If the problem still occurs, contact Lenze.
C60Dh	Internal program error: OPC control.	Restart PC. Reinstall »L-force Loader«.
C60Eh	Error while reading a file.	Check the path of the parameter file.
Communication and download errors		
D100h	Error during the start of the "OPC Ctl" component. • Component has not been installed or has not been correctly registered.	Reinstall »L-force Loader«.
D101h	No connection to the OPC server.	Check that the OPC server has been installed correctly. Reinstall »L-force Loader«.
D102h	OPC server is not in status "Running".	Restart PC.
D103h	Error while creating an OPC item.	Reinstall »L-force Loader«.
D104h	Error while downloading.	The error message contains causes and information about troubleshooting.
D105h	Error while connecting to the OPC server.	Restart PC / reinstall »L-force Loader«.
D106h	Error while disconnecting from the OPC server.	Restart PC / reinstall »L-force Loader«.

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Error number	Cause	Remedy
Error while downloading L-force 9400 application		
8000C702h	Controller inhibit has not been set.	Set controller inhibit on the target system.
8000C704h	Application has not been stopped.	Stop the application on the target system.
8000C801h	Error message of target system while downloading.	Restart target system to establish the "ready for download" state.
8000C807h	Error message of target system: Licence level does not correspond.	Create the application again using the Engineer and transfer it to the target system or update the target system.
8000C808h	Error message of target system: Target does not correspond.	
8000C809h	Error message of target system: Error while configuring the module.	
8000C80Ah		
8000C8**xx**h	Other (not yet listed) error messages of the target system while downloading.	Create the application again using the Engineer and transfer it to the target system.
Errors within the DriveServer		
E7C18000h	Error during download preparations.	Repeat download.
E7C18001h	PLC has not been stopped.	Stop the PLC program on the target system.
E7C18002h	Controller inhibit has not been set.	Set controller inhibit on the target system.
E7C18003h	Incorrect file type (no LC9 file).	Create new LC9 file.
E7C18004h	Checksum test is negative (incorrect checksum).	Repeat download. Increase time-out time in the system bus configurator (e.g. to 3 seconds).
E7C18005h	Item can momentarily not be accessed due to download.	Repeat download after a few minutes or restart your PC.
E7C18006h	Target system is momentarily busy copying RAM blocks.	Start the PLC program on the target system.
E7C18007h	Error occurred after the download.	Repeat download.
E7C18008h	Error after version comparison during download of an LC7 file. • Different versions in LC7 file and target system.	Update the operating system for 9300 EK.
E7C18009h	"Cam" template is not available on the target system.	Create DDS project based on **Cam template** and transfer it into the target system.

7.2   Log files

Log files list all important events for documentation and diagnostics purposes. These events are for instance:

▶ Program start

▶ Connection establishment to the target system with the communication parameters set

▶ Target system found (name, version, software product code, etc.)

▶ Download information

▶ Disconnection

▶ Program end

🔆 **Tip!**

The "Lforce_Loader.txt" log file is automatically created by the »L-force Loader« and new entries are added until the size of the log file exceeds the value specified in the initialisation file by the key "SizeLogFile".

If the value is exceeded, the system asks whether a log file backup is wanted before the existing entries of the log file are deleted.

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Every event saved in the log file contains the following information:

Column	Meaning	
Id	Function index identifying the event:	
	0001h	Program start
	0002h	Program end
	0003h	Log in
	0004h	Log out
	0005h	Opening of a DDS binary file
	0006h	Preparation of the DDS binary file for the download
	0007h	Download of the DDS binary file
	0008h	Start of the PLC program
	0009h	Stop of the PLC program
	000Ah	Opening of a GDC parameter set file
	000Bh	Opening of a GDC device description
	000Ch	Reading of the code list from the GDC device description
	000Dh	Reading of the code initialisation values from the GDC parameter set file
	000Eh	Parameter set transfer
	000Fh	Update of the status line
	0010h	Opening of a script for the batch mode
	0011h	Processing of the script
	0012h	Opening of the application data
	0013h	Preparation of the application data for the download
	0014h	Download of the application data
	0015h	Enable of the target system
	0016h	Inhibition of the target system
	0017h	Saving of a parameter set with C0003
	0018h	No valid bus server
	0019h	Status: PLC program/application started
	001Ah	Status: PLC program/application stopped
	001Bh	Status: controller inhibit set
	001Ch	Status: controller inhibit not set
	001Dh	Codes not transferred by definition.
	001Eh	Code not transferred due to errors.
	001Fh	Saving of profile data (*.lc7) via C0003
	0020h	Download of application and/or program data
	0021h	Start of the rescan for extending the PDB search paths
	0022h	Extension of the registry by a potential PDB search path
	0023h	Opening of an L-force 9400 application file (*.lfl)
	0024h	Identification of an L-force 9400 Servo Drive
	0025h	Transfer of L-force 9400 application data

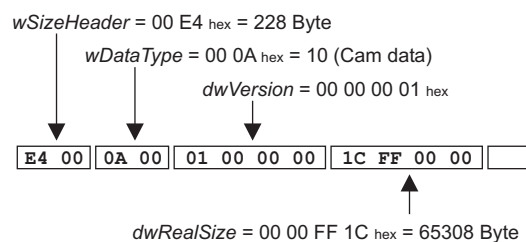| Column	Meaning
Category	The following categories are available: • Error • Warning • Note • Info
Date and time	Time when the event occurred.
Message text	Short description of the event.
Error code	Error number (if an error occurred).

DMS 4.0 EN - 07/2007

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7.3 File header for application data

> **i** **Note!**
>
> The file header is not valid for *.lc7 files. *.lc7 files can only be transferred to the "9300 servo cam profiler" target system.

Name	Data type	Data length in bytes	Contents		
wSizeHeader	WORD	2	Length of the header in bytes		
wDataType	WORD	2	Specification identifier of the data • After the download this information is available under C2131.		
				0 ... 10000	Lenze-specific data
				> 10000	User data
dwVersion	DWORD	4	Data version • After the download this information is available under C2132.		
dwRealSize	DWORD	4	Length of the user data in bytes (without header)		
dwTimeStamp	DWORD	4	Time stamp of the last data change • After the download this information is available under C2133.		
wLicenseInfo	WORD	2	Reserved for future extensions		
wSizeSymbolicName	WORD	2	Length of the symbolic file name		
achSymbolicName	ACH	wSize Symbolic Name	Character array containing the symbolic file name • After the download this information is available under C2130.		
wCopyToRam	WORD	2	Selection whether the data is automatically copied to the application RAM of the PLC after the download, or not. • Maximum data length = 128 kbytes (RAM blocks 1 & 2)		
				0	Data is not copied to the application RAM.
				1	Data is copied to the application RAM.
				2 ... 65535	Reserved
dwReserved	DWORD	4	Reserved for future extensions		
awSizeAddInfo	DWORD	190			

For the interpretation of the header information applies: least-significant byte first:

wSizeHeader = 00 E4 hex = 228 Byte

wDataType = 00 0A hex = 10 (Cam data)

wVersion = 00 00 00 01 hex

| E4 00 | 0A 00 | 01 00 00 00 | 1C FF 00 00 | |

dwRealSize = 00 00 FF 1C hex = 65308 Byte

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FEEDBACK

Your opinion is important to us

These Instructions were created to the best of our knowledge and belief to give you the best possible support for handling our product.

If you have suggestions for improvement, please e-mail us to:

feedback-docu@Lenze.de

Thank you for your support.

Your Lenze documentation team

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