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User Manual for

# ADaPT

Release 4.0



## Advanced Driving and Programming Tool for Digital Command Control Systems

© 1999-2022 by Dipl.-Ing. Ewald Sperrer Software-Entwicklung

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# Introduction

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## General Notes

*An explanation of the technical terms used in this manual can be found in the glossary.*

*ADaPT uses a Microsoft Access™-compatible database (compatible to MS Access / Office 2000 or newer).*

Welcome to "ADaPT" (*Advanced Driving and Programming Tool*)!

Since several parts of digitally controlled model railroads have been standardized by the NMRA, different **decoders** for mobile or stationary use have been introduced on the market. They all have in common a vast range of possible adjustments, which are accomplished by altering so-called **configurations variables**, short **CVs**. To carry out these adjustments (also called **programming**) only with the on-board tools provided by the digital command systems themselves is not always an easy task, since the number of keys and the size of the display on the handheld or controller are limited.

It suggests itself to use a personal computer for this purpose, since most digital command systems offer a computer **interface** or already have it built-in in the command station.

This software product should help you to make the adjustments of the different variables of your loco decoders as easy as possible. Many of the current decoder types of all major manufacturers are supported.

For an easy assignment of decoders to locos, ADaPT uses an **engine database**, which contains - besides the decoder settings - additional information about the engine (manufacturer, era, motor type etc., even a picture of the loco can be included).

Additionally, for each loco a graphical **controller window** can be opened, which can be of great help for checking new decoder settings. The same can be done for accessory decoders by using **switchboard windows**.

This manual contains information about installation and operation of the program. Also all differences between the shareware release and the full version of the software will be explained.

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## Structure of this Manual

This manual is divided into four sections:

- using the engine database
- configuration of the program
- programming of decoders
- using controller and switchboard windows

We will start with the general handling of ADaPT, which will not be too difficult or different for anybody who already has had some experience with other Windows based software products.

*The ReadMe-file also contains a short form instruction for using ADaPT.*

Please note that any information that did not make it into this manual will be found in the file **ReadMe.txt**. This file will be shown during program installation but can also later be displayed by activating the menu item **? / Show ReadMe file** or by clicking onto the "ReadMe" icon or the identically called menu entry under **Start / Programs** (newer Windows releases).

One word about the notation used in this manual: important terms, menu items and button titles will be shown in **bold face**. Special terms are explained in more detail in the glossary at the end of this manual. If graphical buttons should be activated, the picture of the button to be pressed will be

shown (like ).

This symbol indicates that the text nearby explains differences, which are caused by the type of the digital command system in use.

Functions that have been added or modified in ADaPT Rel. 3 are labelled throughout this manual by the symbol shown on the left.

*New in ADaPT **V4.0***

This note indicates a new or enhanced feature of ADaPT V4.0.

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## Prerequisites

*A minimum of 512 MB (XP) or 1 GB of main memory (RAM) is recommended with Windows XP, Windows Vista or Windows 7 / 8, 4 GB for Windows 10.*

ADaPT runs on all IBM compatible PCs with at least 256 MB of main storage (RAM) and at least 20 MB of free hard disk space. A Pentium type processor is minimum requirement. Note that these restrictions are mainly caused by the operating system (Windows 2000, XP, Vista, Windows 7 / 8 / 10). Starting with ADaPT Rel. 3.1 also the 64-bit versions of Windows are supported.

*If your computer is not equipped with a serial port, a USB-Serial converter can often be used (available from your local computer / electronic supply store).*



*Zimo offers a special "bundle" version of the MXULF ("MXULFA-PF") which includes a license for ADaPT. Please note the specific installation instructions in the next chapter.*

*It is recommended to update the MX10 to the latest firmware.*

For the connection with the digital command system a free serial interface (COM1: - COM10:) is necessary as well as a proper interface cable (consult the operating manual of your digital command system for details) or a free USB port (Lenz, Tams, Zimo MX10, MXULF). Note that for a USB connection the software drivers have to be installed, which are delivered with the digital command control hardware / interface. For Zimo MX10 an Ethernet connection (LAN) is recommended.

**Zimo DCC system:** An MX1, MX1/EC, MX1/HS, MX1/N, MX1/Multiprotocoll, MX1/2000, MX10 command station or the MXULF decoder programming device and an NMRA compatible loco decoder (with "/N" name suffix) is required. As command station software for the MX1 release (EPROM / Flash version) revision 3.06 or higher is recommended. The "Zimo binary data protocol" (see "Digital command station" on page 33) cannot be used with older versions.

The Zimo MXULF decoder programming device is connected using the USB port of the PC. The corresponding serial port that has to be assigned in ADaPT can be looked up in Window's Device manager.

Please note that ADaPT cannot be used with the Zimo MX31ZL system cab due to a limited implementation of its computer interface.

The Zimo MX10 central unit can also be connected via Ethernet to your PC or your home network. The USB interface of the MX10 should not be used.

**Lenz DCC system:** A Lenz LZ100 command station as well as the computer interface LI100, LI101(F) or LI-USB are necessary. The software release of the Lenz units should be version 2.0, 3.0 or higher. When using the Lenz Decoder Programmer please note that the driver software on the included CD has to be installed, but none of the other software in this CD (DecoderProgrammer, ...) must be active when ADaPT is used. When connecting a Lenz device using the USB port, the corresponding serial port that has to be assigned in ADaPT can be looked up in Window's Device manager.

**Intellibox:** All currently delivered versions of the Intellibox including Fleischmann's TwinCenter are supported by ADaPT. Intellibox II is not supported.

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**Important note:** When using the Intellibox please note that the device configuration **Syntax** (found in the **Basic Settings**, menu item **Interface**) has to be set to **6050 and Intellibox** (for details please consult the Intellibox manual).



**Tams MC:** ADaPT V3 was tested with firmware revision 1.45 of the Tams MasterControl. No information can be given about the compatibility with older firmware releases. Windows XP, Vista and Windows 8 and 10 (32 bit and 64-bit editions) operating systems are officially supported, but the program could work under Windows versions (untested).

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## Differences Shareware Release - Full Version

As delivered (CD or downloaded from a website) the program always runs as a so-called **shareware** product, even if bought and paid for as full version. As such, the program can be used free of charge and may also be copied and passed along to others (also free of charge) as long as all conditions of the license agreement (which will be shown at the beginning of the program installation) are met.

In the shareware release of ADaPT all programming functions remain fully functional, but the engine database is restricted to three entries and the controller as well as switchboard windows are not available. Additionally a note will be shown from time to time during decoder programming, which reminds the user about upgrading to a full version. The full version comes with a printed manual (only when ordered as CD); apart from that, both the shareware and full version are identical.

Instructions about how to change a shareware release into a full version can be found under "Conversion of a Shareware Release into a Full Version" on page 8.



# Installation

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## Preparations

In case you want to connect your digital command system with your PC using a USB connection, please install the driver software which came with the digital command system or the interface hardware (or download it from the manufacturer's homepage) before using ADaPT.

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**Note:** Zimo's MXULF contains the USB driver as well as an ADaPT setup on it's included USB stick (the MXULFA-PF also includes an unlock key for ADaPT which matches des device's serial number). Instructions on how to install the driver can be found in the MXULF operation manual.

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## Installation of the Program

### Installation from CD

Put the CD into your optical drive and wait until the installation dialog appears. If this does not happen, start the Windows Explorer, navigate to your optical drive and double click at **setup.exe**.

### Installation from a Website

By clicking on the appropriate link, the file **ADAPT40.EXE** will be copied to your computer. You may select any directory with at least 20 MB of free hard disk space for it. Afterwards start this file (e.g. by double-clicking it in the Windows Explorer) and follow the instructions on the screen. The file **ADAPT40.EXE** may be deleted after successful installation.

The most current version of the software can always be found under this web address: **[www.stp-software.at](http://www.stp-software.at)**.

### Installation from ZIMO MXULF USB stick

Each MXULF includes a USB stick. Connect it to any available USB port of your PC. If the setup program should not start automatically (probably you have to accept a dialog window before), open Windows Explorer, navigate to the

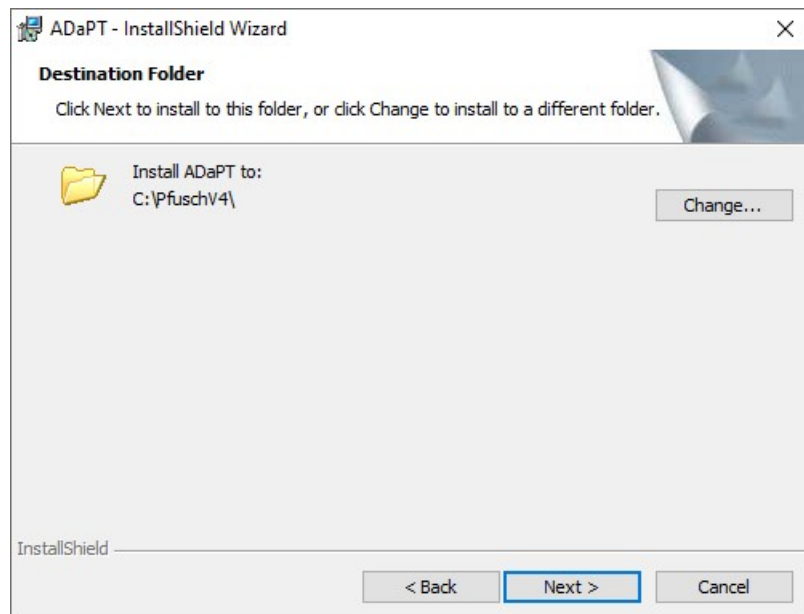
drive assigned to your USB stick and double click on the file **Setup.exe**.

---

## Installation Dialog

After starting the installation process a note is shown, which requests you to stop all running programs. The installation procedure then continues step by step, the button **Next** will lead to the next step, clicking on **Back** to the previous installation dialog.

After showing the license information (which also contains notes about passing the shareware version on to others) and the ReadMe file, the installation path has to be entered, i.e. the directory, where the program should be installed.



Using the **Change...** button a different location than the standard installation directory C:\PfuschV4 can be selected. If a non-existent directory is entered, the creation of this directory has to be additionally confirmed. See also the note below for update installations!

Finally as a last check the selected installation directory will be shown. By clicking on **Next** the copying of the program files will be initiated.

*Please note that write access rights are required for the "Db" subdirectory.*

After the copying process is finished, you can select whether to start the program immediately and / or the ReadMe file (with up-to-date information about the current program release) should be shown. Afterwards the program installation is finished.

When starting the program for the first time, you should select the type of your digital command system as well as the serial interface it is connected to by opening the **Parameter**

/ **Options** dialog window. Additional information is given under "Program Options" on page 32.

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## Installation of an Update

If an earlier version of ADaPT is already installed on your computer, you may simply install the new release in the same directory as the previous version. The program will be updated and all new program and decoder files will be included. The data you have entered as well as your program settings will not be changed.

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**Important note:** The engine database remains unchanged after an update (i.e. your engine data will not be overwritten) **if you select the same installation directory as used for your previous version!**

So when installing ADaPT V4, select the same target directory during setup as used by your previous version!

New decoder manufacturers and types will not be visible in the database. To add these items, activate the function **File | Update database...**, otherwise new decoder types cannot be accessed (this needs to be done only once).

The default name of the database file "PFUSCHV3.MDB" has not been changed in ADaPT V4 as the internal structure is still mostly identical to V3.

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*When updating from V3 to V4 this update of the database is not required.*

### Update from ADaPT Rel. 1 or 2 to ADaPT Rel. 3

When updating to ADaPT Rel. 3 the database structure is changed, i.e. the engine database of an older version can no longer be used directly and after installation a new, empty database (except for three sample entries) is available. To retrieve the data from the previous installation, select **File / Open database...** and navigate to the engine database of your previous version (located in the db\subdirectory of your old installation) and select the proper .mdb file. You will then be asked if the information should be imported in your current engine database.

If during installation of an update a **deinstallation** of the previous version should be required (this is possible depending on operating system and installation history and will be indicated by the setup procedure), it is recommended to back up the **db** subdirectory as well as the file **pfusch.ini** in the installation directory and copy the m back to their original locations after setup is completed.

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## Conversion of a Shareware Release into a Full Version

*As registered user of a full version you will also get information about new program releases.*

*New in ADaPT V4.0*



After the installation of ADaPT the program runs as "shareware release" (as mentioned above). In this mode the database is restricted to three entries, controller and switchboard windows are not available and notices about registration are shown during decoder programming.

When updating from ADaPT V3.x to V4 a new unlock code is required.

**Note:** To unlock an ADaPT license which is included with Zimo's **MXULFA-PF** please follow the instructions given in the next chapter.

To convert the program into a full version (without the restrictions mentioned above), follow these steps:

1. Start ADaPT
2. Open the register dialog window (? / **Register information...**)

Register key:	7B6F4C1362032534
Serial #:	
License owner:	
Unlock key:	

Get unlock key via e-mail

OK Cancel

3. Enter the serial number into the appropriate field (can be found on the CD or has been sent by the dealer where the software was obtained)
4. Select a user name to whom the software should be licensed (16 characters maximum including spaces, e.g. John Doe) and enter it at the designated place.
5. Submit the information by clicking at **Get unlock key via e-mail** (an additional window may pop up asking you for access to your e-mail software).
6. After some time you will receive your registration information (serial number, license owner and unlock key).
7. Enter the information you have received into the appropriate fields of the register dialog (? / **Register information...**) and click on **OK**.
8. Starting with the next program launch, ADaPT will be usable as full version.

Please note that the license information is bound to the computer hardware, i.e. the licensing only works for the computer where it has been installed.

In case you should not have access to e-mail on the PC where the software is installed, open a form by selecting **? / Show register form...** and enter the information explained above manually. Print out the form and send it to the address given on the form.

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**Note:** When updating from release 2.x and 3.x to release V4 a new unlock key will be necessary, otherwise the program will work as shareware release after the installation of the update.

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## Activation of an bundled ADaPT license (Zimo MXULF)



*Please note that not each MXULF includes an ADaPT license but only the version **MXULFA-PF**.*

When obtaining a Zimo **MXULF-PF** device an ADaPT license is included. It is a full version license without any restrictions or differences. Only the unlock process is different in that an included unlock key is used which is linked to the serial number of the MXULF.

Because the standard ADaPT software and no special version is included, the software can be updated by downloading a newer release from the STP homepage, just as described above.

To convert the program into a full version (without the restrictions mentioned above), follow these steps:

1. Start ADaPT
2. Open the register dialog window (**? / Register information...**)

Register key:	7B6F4C1362032534
Serial #:	100999
License owner:	MXULF
Unlock key:	999999999

Get unlock key via e-mail

OK Cancel

3. Enter the serial number of the MXULF into the appropriate field (can be found on the backside of the device or on the included information sheet). The field **Register key** is not relevant in this case.
4. As soon as the serial number is entered, ADaPT recognizes an MXULF unlock attempt (and not a

"standard" ADaPT registration) and displays the text **MXULF** in the **License owner** field.

5. Enter the **Unlock key** (also shown on the information sheet included with the MXULF) and click on **OK**.
6. Starting with the next program launch, ADaPT will be usable as full version.

Please note that the license information is bound to the serial number of the MXULF, i.e. the licensing only works for the MXULF with the entered serial number. The serial number is not checked when starting ADaPT but when communication to the device is initialized.

Note also that the correct port for the communication with the MXULF (COMx) has to be set in the **Parameters / Options** dialog (see "Serial interface" on page 34).

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## Uninstallation

After successful installation a new entry called "Uninstall" will be shown under **Start / Programs / ADaPT**. By activating this entry, ADaPT will be deleted from your computer.

Note that the installation directory itself as well as all files that have been altered by you (in general these are the database `PfuschV3.mdb` as well as the configuration file `Pfusch.ini`) will not automatically be erased. You can delete the directory into which you have installed the program (default `C:\ADAPTV3`) manually, using the Windows Explorers after successful uninstallation of the program.

# General Operating Instructions

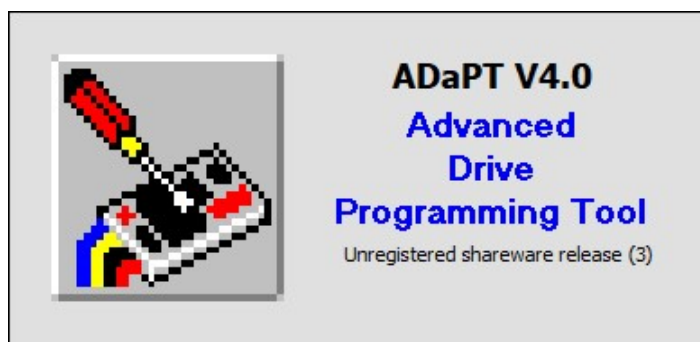
---

## How to Start the Program

Click on **Start** and on **All Programs** and select in the now appearing menu. From the pop-up list select **ADaPT** and afterwards **ADaPT Rel. 4**.

*If you are using a non-licensed shareware release, "Unregistered Shareware Version" will be shown in the status window.*

Now the ADaPT main screen showing the first database entry page should be displayed. At the same time, a smaller window showing the current licensing state is superimposed for a few seconds. If it does not disappear on its own, just click on it with the left mouse key.



*When stopping the program, all changes made to the database will be automatically saved to disk.*

ADaPT can be closed - like any other windows program - by selecting **File / Exit** from the standard toolbar, pressing **Alt+F4** on the keyboard or clicking on the x-mark at the upper right corner of the program window.

---

## Program Overview

ADaPT is divided into four main sections of which each is shown in a separate window:

- **Engine database**
- **Decoder programming**
- **Engine throttle**
- **Switchboard**

After the program has been started, the engine database window will be shown, which is also called the "main window". Engine data pages will be saved and displayed in numerical order based on their decoder address. The buttons with ar-

rows on the bottom of the window can be used to jump to and fro between the different locos / addresses. More information about the engine database can be found under "The Engine Database" on page 15.

The programming window will be opened by clicking on the



button in the main window. As long as the programming window is open, all other program windows are blocked, i.e. they can only be accessed again after the programming window has been closed.

*Throttles and switchboards are not available with the shareware release of ADaPT.*



Engine throttles and switchboards may be opened simultaneously from the main window (even multiple times) and always refer to the engine or decoder address shown in the main window at the time the throttle / switchboard was opened. Only one throttle / switchboard can be opened for a single address.

Whether a throttle or a switchboard can be used for a given address is determined by the field **Type** in the upper part of the database window:

<b>Engine:</b>	controllable by engine throttle
<b>Accessory:</b>	controllable by switchboard
<b>Other:</b>	controllable by engine throttle

More information about throttles will be given under "The Engine Throttle" on page 56, about switchboards under "The Switchboard" on page 58.

Additionally there are also several program options, which can be accessed using the menu item **Parameters** (see also "Program Parameters" on page 27).

The **online help** is accessible with the tabs **? / Contents...** or **? / Find...**, or simply by pressing the **F1** key. In the latter case, depending on your current operation within ADaPT, the corresponding chapter of the online help will be shown (context sensitive help).

*For information about cables and connectors please consult the operation manual of your digital command system.*

Please note that the programming, engine throttle and switchboard window will not work properly unless a cable connection from your computer to your digital command system is in place and the DCC system is turned on. More information on this subject will be given under "Communication " on page 36.

---

## Program Handling

The operation of ADaPT does not differ from that of other Windows programs, so you do not have to relearn anything.



*The Edit menu commands are partly deactivated in the shareware release of ADaPT.*

*Because of the different width of single characters, this state may occur even if there is still some place left in the data entry field*

The program is controlled using the **menu** on the standard toolbar (top of window) and via **buttons**. Many program functions can be activated either way.

The **File** menu offers commands to use different databases, to print out your engine database and to close ADaPT.

The **Edit** menu contains commands for the manipulation of the engine database (e.g. create new engines, delete, find, copy, ...)

Different program options as well as the contents of **selection lists** are manipulated using functions of the **Parameter** menu.

Finally the **Help** menu allows you to activate the online help and to display and enter information concerning the registration of the full program version.

Information in the **data entry fields** (recognizable by the white background color) can be entered using the keyboard or also - in the case of selection lists - by clicking on the button with the black triangle and making a selection from the pop-up list, which will appear.


All data entry fields have an upper limit of how many characters that can be entered. If this limit is reached, a signal tone is given and further keyboard entries for that field are not accepted. This limit is different from field to field; additional information is given under "Database Structure" on page 64. Additionally it is not possible to enter letters and special characters in numerical data fields (Address, Maximum speed, Price).

Please note that for many buttons, labels and data entry fields a short help information is given, when the mouse cursor is moved over this object.

---

## Zooming



The size of the ADaPT program window can be adjusted to fit the demands of the user. To do so, move the mouse to the lower or right border of the program window (or to the lower right corner) until the cursor changes shape (double arrow ). Now press and hold the left mouse button and move the mouse down and / or to the left – the window will be expanded accordingly. By releasing the left mouse button the zoom operation is finished.

Please note that the zooming will be applied to all windows opened by ADaPT (except for the tabular CV pages and the online help), but can only be adjusted on the main window. Also note that a reduction of size is only possible up to a

certain value to maintain the readability of the information. The selected zoom factor will automatically be stored when ADaPT is closed and is restored when the program is started again.

# The Engine Database

---

## General Information about the Database

*Please note that addresses beyond 127 (sometimes even beyond 99) are not possible with every decoder.*



### Database Structure

The ADaPT database contains all information entered for every engine and is sorted after **decoder addresses**. This implies that for each engine an address between 1 and 10239 has to be assigned. For engines without decoder a (temporary) unused address has to be used.

Additionally each engine entered into the database can be assigned to a so-called **Collection**. This allows the user to have several independent lists of engine in the database and – using the filtering options – only show locos of a single collection.

Collections are typically used for:

- Grouping locos according to scale (H0, N, G, ...)
- Managing engine information for different owners (club, dealer, ...)
- Grouping of locos by storage location etc.

The name of a collection can be an arbitrary string of up to 16 characters. The engine database is always shown in alphabetical order of the collections; within a collection it is ordered by loco address. It is possible to have several locos with an identical decoder address in the same database, even within the same collection.

Accessory decoders (also sometimes referred to as "switch decoders") are treated like engine (loco) decoders and are also entered and accessed via their address used in the digital command system.

Besides the basic information shown in the main window, ADaPT also stores the content of all configuration variables and their state (entered, read from the decoder, programming error) for all entered engines / decoders. Data belonging to a single engine / decoder is also called a **(data) record**. The size of the engine database is (practically) not limited (but the size of the .mdb file must not exceed 2 GB).

*By importing the database into Microsoft Excel™, other kinds of reports with different layout or sorting orders than the standard listing provided by ADaPT are possible.*

The widely used Microsoft Access™ format (Access 2000 version) was selected as the format for ADaPT. This format can be processed by many other popular software products (Microsoft Excel™, Seagate CrystalReport™ etc.). A modification of database structure or contents outside of ADaPT however is strongly discouraged, because several checks and data links are only provided within the program environment.

Please note that this data format is possible no longer supported from current software products, so older versions should be used.

## Screen Contents

The main window of ADaPT shows all relevant information for one engine. All information pertaining to the decoder of the same engine is shown in the programming window.

Most data field content is adequately explained by the label to the left thereof. Here are some additional explanations:

**Collection:** 16-character entry, used for sorting and filtering of all objects in the engine database. This field can be left empty (if not used).

**Short name:** 6-character entry, will be shown in the title bar of throttle and switchboard windows. An entry in this field is mandatory.

The screenshot shows the ADaPT V3.1 software interface. The window title is "ADaPT V3.1 - PFUV3DEM.MDB". The menu bar includes "File", "Edit", "Parameters", and "?". The main form contains the following fields and controls:

- Collection: Demo (dropdown)
- Address (1-10239): 7 (text input)
- Short name: 6P-60 (text input)
- Engine group: 2 (text input)
- Description: Santa Fe 'Dash' (text input)
- Engine type: Diesel engine (dropdown)
- Remark: modified model from Atlas prototype (text input)
- User info 1, 2, 3: (empty text inputs)
- Series: 6P-60M (text input)
- Operation #: 1540 (text input)
- Maximum speed (mph): 95 (text input)
- RR company: Santa Fe (dropdown)
- Era: Era IV (dropdown)
- Manuf.: Atlas (dropdown)
- Catalogue #: (empty text input)
- Scale: 1:87 (dropdown)
- Price: (empty text input)
- Motor type: 3-pole (dropdown)

On the right side, there is a picture of a red and yellow locomotive. Below the picture are buttons for "Incl. picture...", "Delete picture", "Digitrax", and "DH140". At the bottom of the window, there is a toolbar with icons for a grid, a magnifying glass, a document, a close button, navigation arrows, "Record 2 of 3", a decoder icon, a motor icon, and a switchboard icon.

**Engine Group:** numerical entry from 0 – 99, will be used in combination with the computer switchboard "STP".

**Type:** see "Program Overview" on page 11

All remaining fields (with the exception of the address, see above) are intended for user information and can be filled with any data.

*Selection lists can easily be recognized by the black triangle on right side of the data entry field.*

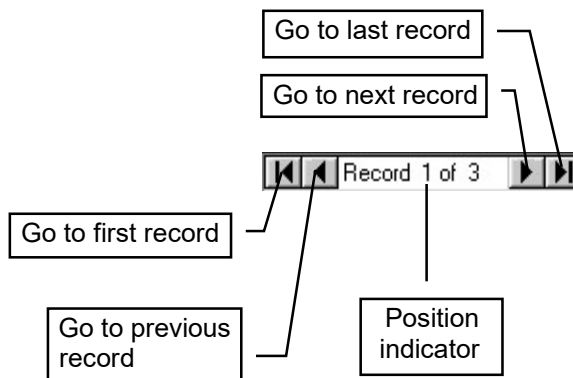
To speed up and unify data entry, predefined values can be selected from drop-down lists in many fields (Engine type, Manufacturer, ...). The contents of these selection lists can be tailored to your needs by functions provided in the

**Parameters** menu (see also "Selection Lists and Options" on page 27).

On the other hand it is also possible to manually enter values that are not contained in the selection list via keyboard.

### Navigation - Scrolling

The term "Navigation" refers to the ability to browse within the database, i.e. to switch between the different records (= engines / decoders). For this purpose there is a **navigation bar** on the lower border of the main window. Additionally the **Find** command can be used to directly access a specific record or do reduce the number of shown data records using **filtering** (see also "How to Search the Database" on page 23).




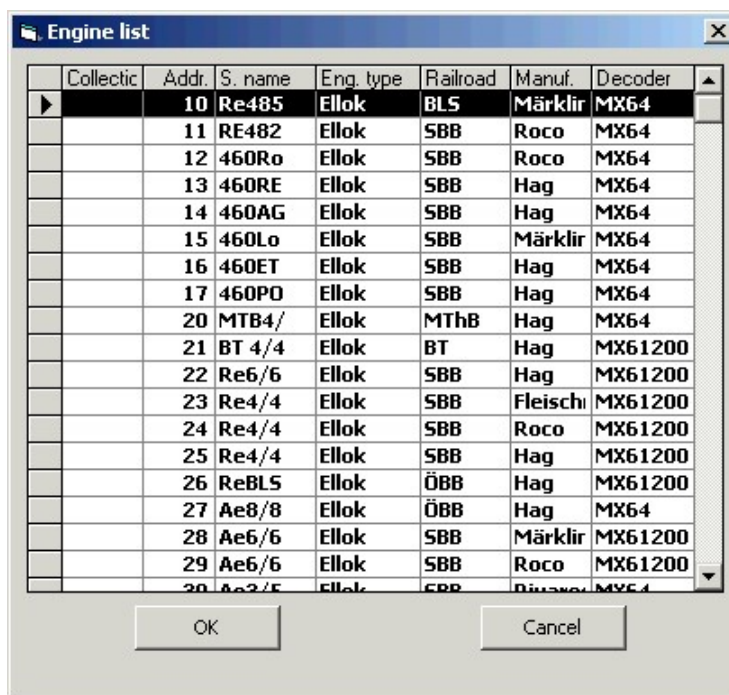
Normally the browsing is done in order of ascending addresses (within a collection, see "Database Structure" on page 15). Note that when a new record is inserted, it will at first be stored after the last existing record. After the next program start, the record is sorted at the correct location.

### Navigation – List View



In addition to navigation by scrolling where always a single record of the database is shown (i.e. only the information of a single engine), there is also an option to show more entries of the database in a tabular view.

To display the table, click at the symbol  in the lower left area of the program window. A window with a tabular view of the records will be shown.



Collectic	Addr.	S. name	Eng. type	Railroad	Manuf.	Decoder
	10	Re485	Ellok	BLS	Märklir	MX64
	11	RE482	Ellok	SBB	Roco	MX64
	12	460Ro	Ellok	SBB	Roco	MX64
	13	460RE	Ellok	SBB	Hag	MX64
	14	460AG	Ellok	SBB	Hag	MX64
	15	460Lo	Ellok	SBB	Märklir	MX64
	16	460ET	Ellok	SBB	Hag	MX64
	17	460PO	Ellok	SBB	Hag	MX64
	20	MTB4/	Ellok	MThB	Hag	MX64
	21	BT 4/4	Ellok	BT	Hag	MX61200
	22	Re6/6	Ellok	SBB	Hag	MX61200
	23	Re4/4	Ellok	SBB	Fleisch	MX61200
	24	Re4/4	Ellok	SBB	Roco	MX61200
	25	Re4/4	Ellok	SBB	Hag	MX61200
	26	ReBLS	Ellok	ÖBB	Hag	MX61200
	27	Ae8/8	Ellok	ÖBB	Hag	MX64
	28	Ae6/6	Ellok	SBB	Märklir	MX61200
	29	Ae6/6	Ellok	SBB	Roco	MX61200
	30	Ae3/5	Ellok	SBB	Roco	MX64

The currently selected engine will be highlighted. Using the arrow keys you can move from engine to engine, using the <PGUP> and <PGDN> keys page wise scrolling is possible. The scrollbar on the right can also be used for that purpose.

By clicking at **OK** or by double-clicking at a line in the table closes the list view and displays the currently selected record in the ADaPT main window. Clicking at **Cancel** will also close the window but will keep the current record that was shown in the main window before the table was opened.

### Adding a Picture

Due to the continuing price decrease of digital cameras and scanners it is now relatively easy to create a digital photo collection of your locos.

ADaPT has the possibility to include these **digital images** in your database and thus allows for a quick visual relation to your engines.

*Many current graphic software packages such as Adobe Photoshop<sup>TM</sup>, Corel Photo-Paint<sup>TM</sup> or also the paint utilities included with Windows allow you to convert or scale digital images.*

*In the configuration file PFUSCH.INI the standard path for importing pictures can be predefined by the line PicDir=<path>.*

*The commands explained here are only intended for experienced users and can be skipped otherwise.*

To add a picture requires a file in one of these formats: Windows **bitmap**, **GIF**, **JPEG** or **WMF** (file extension ".BMP", ".GIF", ".JPG" or ".WMF"). The size of the file is (theoretically) arbitrary, although with larger images lot of disk space will be wasted and browsing between the records will slow down substantially. The optimal resolution of the pictures for ADaPT is 184 x 144 pixels and 256 colors. Higher values will not bring additional improvements in picture quality.

To include the images in the database click on the **Incl. picture...** button. An **open image** dialog window will appear where you can select your image file. By clicking on **OK** the file will be stored within the database and scaled to a size which fits the display field in the main window.

To delete a previously added image, click at the **Delete picture** button. After confirming the request by clicking at **OK** the picture will be removed from the engine database.

### Using Alternative Databases

In order to make it possible to maintain several engine collections individually (e.g. several users, different scales, more than one layout), ADaPT allows you to select the database you want to work with.

The first step is to create a new, empty database with the menu command **File / New database...** In the now appearing file dialog window the name and the directory of the new database can be selected. By clicking on **OK** the database will be created and at the same time will be activated as current database. Please note that an already existing database cannot be deleted by overwriting it with a new one, but must be manually deleted (e.g by using the Windows Explorer). After the creation of the database at least one new record has to be entered (i.e. an address and a short name) to be able to continue.

Using the command **File / Open database...** arbitrary databases, which have been created by the procedure explained above, can be accessed and worked with. Please note that the contents of all selection lists (decoder manufacturers and -types, engine types etc.) are also stored in the database and all changes to that information has to be redone in every other database to be available there. Alternatively the internally used master database "empty.mdb" (from which all newly created databases are copied from), which resides in the ADaPT installation directory, can be opened and modified accordingly.

Which database will be opened when ADaPT is started can be selected in the program options (see "Path for engine database" on page 36). The default database by the way is PFUSCHV3.MDB, it is located in the \db subdirectory if the ADaPT installation directory.



**Note:** Starting with ADaPT Rel. 3 the database field **Collection** offers a similar functionality, so the usage of several databases is in many cases no longer required.

### Update Database

When installing a new release of ADaPT ("Update"), new decoder manufacturers and types may also be included. To have this new information show up in the relevant drop-down lists, the database has to be refreshed first. Instead of doing this "manually", the database can be refreshed by clicking on the menu item **File | Update database...**, which adds the new decoder brands and types to the drop-down lists (the current information will be transferred from the master database EMPTY.MDB to your current engine database). This process has to be done only once after each program update.

### Import Database after Update to ADaPT Rel. 3

ADaPT Rel. 3 uses a new database version and structure. Existing engine databases will **not** automatically be converted into this new format after making an upgrade to this version.

This step is **not required** for an update from **AdaPT V3 to V4!**

To import the database information from a previous version, follow these steps:

1. Open the old database by selecting **Open database...** from the **File** menu
2. Select your "old" engine database in the file dialog box (usually called Pfusch.mdb) and click at **Open**
3. Click at **Yes** in the now opened dialog window



4. The database records will now be imported in the current database. When finished the result of the import operation is shown





5. Click at **OK** to finish the import operation


---

**Note:** Engines, whose decoder addresses are already present in the engine database cannot be imported, they will be indicated as "double" in the final dialog window (see above).


---

## Practical Applications of the Database

### Adding New Engines

To add a new engine / loco to the database, use the menu item **Edit / New** or click on the symbol  on the lower left border of the main window.

In both cases all data entry fields will be cleared and new information can be entered. The entry of address, short name as well as the selection of the type (engine / accessory / others) is mandatory, whereby for the last field "Engine" is preselected by default. The entry of all other fields is optional.

If the "erase" symbol  is clicked at while entering information for a new engine, the creation process is aborted and the newly created record will be deleted.

*The navigation bar will show the text "New record" instead of the record counter.*


Note that after the creation of a new record it will be inserted after the last record. Only after the next program start will the record be found at the proper location, according to its collection and address.

### Copying an Engine

It is possible that the data of two engines are quite similar (e.g. two locos of the same type) or it is sometimes desired that the values of configuration variables be copied from one engine to another. In this case proceed as follows:

1. Navigate to the record to be copied (the so-called source).
2. Select **Edit / Copy** from the menu or press **Ctrl+C** on the keyboard - all information of the current

record will be copied into an invisible background memory.

3. Select **Edit / New** from the menu or click on  (see also "Adding New Engines" on page 21).
4. Select **Edit / Insert** from the menu or press **Ctrl+V** on the keyboard - all data from background memory will be inserted into the new record.

*Besides the visible information on the main page, the values of all configuration variables have also been copied.*

The copy process is now finished. Note that the **Address** field was left empty and a new engine address has to be entered.

Please note also that an insertion from background memory is also possible with already created engine records. The information will be overwritten by the contents of the background memory after activation of the insert function without further warning.

The information which was copied into the background memory stays resident and can be used for further insertion operations (only steps 3 and 4 of the list above are necessary for that purpose).


### Modification of Engine Information

It is quite easy to change engine information you already have entered. Just click on the data entry field you wish to modify and change the contents as required. When you switch to another record, create a new record, delete a record, start a query or exit the program, all your changes will be permanently stored in the database.

How to change or delete engine images in your database is explained in more detail under "Adding a Picture" on page 18.

### Deleting Engines

If an engine is no longer available or is no longer required in the engine database for any reason, it can be deleted by either selecting **Edit / Delete** from the menu, pressing

**Shift+Del** on the keyboard or by clicking on the symbol  on the lower left corner of the main window.


Before the actual deletion takes place, a dialog window appears and asks for a confirmation. If you click on **Yes**, the record (including image and values of configuration variables) will be deleted, if you select **No** the record will remain untouched.

*Please note that there is no possibility to restore deleted records (except if you have made a backup of the database file).*

## How to Search the Database

Once a large number of engines is stored in your database, locating specific engines by browsing (as explained under "Navigation" on page 17) can be somewhat tedious.

For that reason, ADaPT has the possibility to search for specific information. To initiate the search process, select

**Edit / Find...** from the menu or click on the symbol  on the lower left corner of the main window.

After doing so all data entry fields will be cleared and on the lower left corner of the main window the buttons **Find** and **Cancel** will be displayed.

*The "wildcard" search is not possible with numerical data fields, such as "Address", "Maximum speed" or "Price".*

Now enter all values to look for (the search criteria) into their corresponding fields (e.g. address, short name, engine type...). If several entries are made, only records with identical entries will be returned. By entering an asterisk (\*) into a text field, a 'wildcard' search can be specified, where the asterisk stands for any combination of characters (e.g. "6P\*" looks for all records which have an entry in the selected data field which starts with 6P, such as 6P-60, 6P60M or 6P alone).

Note that several functions of ADaPT (e.g. the navigation bar, the **Edit** menu, the programming window, throttles and switchboards) are deactivated when entering search criteria (i.e. while the buttons **Find** and **Cancel** are shown in the lower left corner),.

*Only the first record, which fulfils the given search criteria, can be located in that manner.*

Click on **Find** to activate the location process for the first record that meets the given selection criteria. ADaPT will display this record or will give an error message, if no such record exists.

By clicking on **Cancel** the search mode will be aborted without changing the current position (i.e. the display of the current record) of the database.

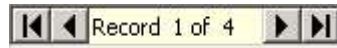
## Filtering of Information




In contrast to the "Search" operation (see "How to Search the Database" on page 23) filtering applies to the currently selected information in ADaPT. As soon as a filter is active, the ADaPT main window (and the tabular list view) will only show records that fulfil the entered filter criteria(s). If for instance the manufacturer "Roco" is set as filter, only those engines are shown that have the value **Roco** entered in the **Manufacturer** field. The other records of the database are not deleted but masked and can be viewed again by removing the filter.

The setting of a filter is similar to the "Search" operation (see "How to Search the Database" on page 23) but instead of clicking at the **Find** button at the end, the **Filter** button is used.

If no record satisfies the filter criteria(s), an appropriate message is shown and the filter will not be activated. In the other case the first record matching the filter criteria(s) is shown and the navigation bar will change its background colour to yellow to indicate an active filter.



To delete an active filter, select **Edit / Find...** again from the menu or click at the  symbol at the lower left corner of the ADaPT program window, leave all data entry fields empty and click again at **Filter**.

### Printing of Information

To get a printed list for an overview of the information stored in your engine database, select **File / Print...** from the main window menu.



*The printout will automatically be adapted to the currently selected paper width, though it is recommended to set your printer output to "portrait" mode.*

The Print dialog window allows you to narrow the number of printed records by entering a start and a final address, a collection or – if filtering is active – the currently filtered selection. By default all records will be printed.

In the **Output** part of the dialog window you can select if the output would be in **list** form (including picture), complete (**1 sheet / loco** – also configuration variables will be printed) or into a **CSV file**.

Click at **Print** to start the printout on the printer selected in the dialog window above or at **Cancel** if you have changed your mind.

The tabular list, printed in the decoder address sequence, contains almost all fields of the ADaPT main window (including decoder brand, type and CV set, but not user info)..

Note that by opening the PFUSCHV3.MDB database with adequate software products (e.g. Microsoft Excel<sup>TM</sup>), listings with different field compositions or sorting order are possible. For more information please consult the manual accompanying your application or read the corresponding online help.

---

**Note for advanced users:** The print format definitions for list and CSV output are stored in the files repl\_ger.rpt and repc\_ger.rpt in the ADaPT installation directory. These definitions were created using *Crystal Reports Pro 4.0* software and can be changed by users owning this product, i.e. a user defined report can be created. This tool is also included in Microsoft's Visual Basic 6.0 development environment. Please note that changes in these files are done at your own risk and no support can be given in this area.

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### **Forwarding of the Engine Database to STP**

The switchboard software product STP also maintains information on engines / locomotives (decoder address, short name, engine group, long name).

Using the function **File / Export Database to STP...** it is possible to transfer the current ADaPT Engine Database to the STP database. To do so the proper target file (STP\_LOCO:DAT) has to be selected, it is located in the STP installation directory.

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# Program Parameters

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## General Information

The "Parameters" menu of ADaPT contains all of the configurable options for the program user. These are divided into **selection lists** and **program options**.

While the first ones serve for a quicker and more standardized way of data entry, the latter contains different configurable program options, such as digital command system used, settings for data communication and the path to the engine database used on program start-up. Also a quick data communications test between the computer and the DCC command station can be performed there.

*The file PFUSCH.INI should only be manipulated using the "Option" dialog window, not by using a text editor.*

While the information entered into the selection lists will be stored within the engine database, all program options are saved into a file called PFUSCH.INI, which is located in the ADaPT installation directory.

---

## Selection Lists and Options

All selection list dialog windows are designed similar and contain a **tabular value list**. In every selection list there is a current entry (marked with a black arrow on the right side, called **record pointer**), to which all keyboard entries are directed at. The position of the current record can be altered by pressing one of the **arrow keys** (next or previous entry) or by using the **Pg Up / Pg Dn keys** (scroll one window contents up or down).

If there are more entries available than can be displayed within the window, a **scroll bar** will be shown on the right window border, which can be used to easily navigate between the different list entries.

To **create a new entry** there is an **empty entry** at the end of every selection list (i.e. at the bottom of the list), which is marked with an asterisk at the left. New entries have to be made in this field.

*Because information can be connected to other areas in the program, it can happen that the deletion of an entry is not valid (e.g. if a decoder type is still assigned to an engine, the decoder type cannot be deleted and an error message will be shown).*



*The manufacturer number should not be selected arbitrarily because it is stored within the decoders and is checked by ADaPT when reading or writing configuration variables.*

To **alter an entry** move the record pointer to the appropriate entry and modify the contents as desired.

For the **deletion of an entry** mark the item by clicking on the record pointer (the entry will then be displayed inverted, i.e. white on a black background) and press the **Del** key. The entry will be erased without further warning (with the exception of decoder types and manufacturers with accompanying decoder description files).

By clicking on the **Close** button all changes will be saved into the database and the selection list window will be closed.

To facilitate sorting of values in the value list, all value lines in these windows are numbered sequentially (**Seq.**) in the first column of the value table. A (positive) numeric value can be entered into these fields, which determines the sequence in which the entries will be displayed. Values with a lower value will be shown closer to the top, higher values closer to the end of the table.

So a personal sequence of often used values can be established. Rows with no value in the sequence field are shown at the end of the list.

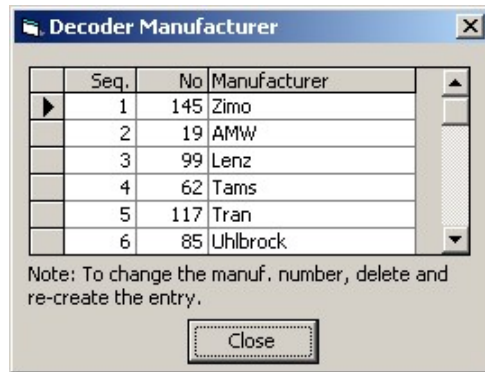
## **Decoder Manufacturer**

All decoders managed by ADaPT have to be identified in the manufacturer and decoder type fields by selecting the appropriate information from the drop-down lists. ADaPT comes with a large number of manufacturers already preinstalled..

The decoder manufacturer selection list contains two columns, the **manufacturer number** and the **manufacturer name**. The manufacturer number (manufacturer ID) is a number between 1 and 255, is distributed by the NMRA and can be found in the instruction sheet accompanying the decoder or also on the world wide web (e.g. on the website <http://www.nmra.org/standards/DCC/mfgnumbers.html>).

The manufacturer name must not contain more than 8 characters (no special characters except '-' and '\_') and will be used to create a subdirectory, into which description files for all decoders of this manufacturer will be stored afterwards (see "Decoder Types" on page 29 and "Format of Decoder Description Files" on page 65).



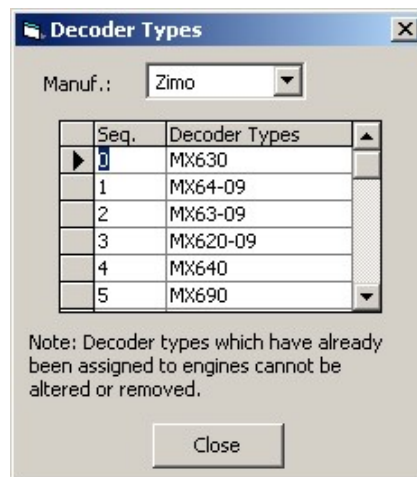


Please note that the manufacturer number cannot be altered directly (only by deleting and re-creation of an entry) and a deletion of a manufacturer is not possible, if there are still decoder from that manufacturer in the decoder type selection list. A deletion of a decoder manufacturer also causes a deletion of the accompanying file subdirectory and all files contained therein.

Please note that there is a possibility to update the list of decoder manufacturers automatically after a program update. Details can be found under "Update Database" on page 20.

## Decoder Types

Similarly to the decoder manufacturers, all decoder types of each manufacturer are managed in a selection list window. After they have been defined here, they can be assigned to the various engines (this process is explained in more detail in "Decoder Type" on page 40).



The decoder type window has a selection list in the upper part, which contains all entered **decoder manufacturers**. Before any decoder types can be displayed, created, altered or deleted, a decoder manufacturer must be selected from this list. To accomplish this, click on the black triangle on the right of the manufacturer selection list to open a pop-up list and select the desired decoder manufacturer by clicking

on its entry (if necessary, use the scroll bar to display more entries). All decoder types of this manufacturer will now be shown in the list below.

*It is recommended that after the creation of a new decoder manufacturer, a file called DEFAULT.DEC is created in the assigned subdirectory or to copy this file from another manufacturer directory and modify it according to a typical decoder type of this manufacturer.*

ADaPT uses detailed information about decoders from a so-called **decoder description file**. If a new decoder is created, a decoder description file with the same name and the file extension ".DEC" (e.g. MX61.DEC) will also be created in a subdirectory determined by the decoder manufacturer (see "Decoder Manufacturer" on page 28). For this reason the decoder type description must not exceed 8 characters (no special characters except '-' and '\_'). This newly created decoder description file is a copy of the "DEFAULT.DEC" file from the same directory. If this file does not exist, the file "DEFAULT.DEC" from the ADaPT installation directory (which corresponds to the decoder manufacturer "empty" and decoder type "empty") will be used as a template instead.

Details about decoder description files will be given under "Format of Decoder Description Files" on page 65.

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**Note:** New and updated decoder description files (\*.DEC) often can be found on the Internet (for instance on the Zimo home page [www.zimo.at](http://www.zimo.at)). To include these files into ADaPT, load these file(s) on your computer (in an arbitrary directory, but not in the ADaPT-subdirectory of the decoder manufacturer!) and activate the function **File | Import decoder type....**

You will be asked for the place where the downloaded decoder file has been saved before and then the decoder file will automatically be integrated into ADaPT. The manufacturer of the decoder must already exist in the database. If the decoder type already exists, you must confirm to overwrite it.

The downloaded file may be deleted afterwards.

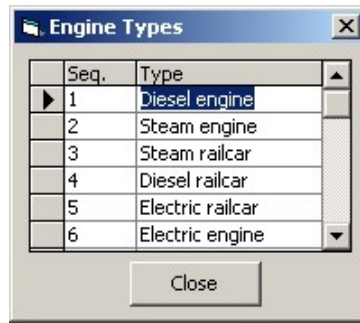
---

Note that decoder types, which have already been assigned to at least one engine of the engine database, cannot be deleted or modified.

Please note that there is a possibility to update the list of decoder types automatically after a program update. Details can be found under "Update Database" on page 20.

## Engine Types

In this selection list all engine types that have to be managed, such as steam locos, diesel locos etc. will be stored.



When deleting one of the entries in this (and also in the following) selection list(s) there is no check if the entry has already been used with one or more engine(s). This will have no consequences on consistency and completeness of the database, though.

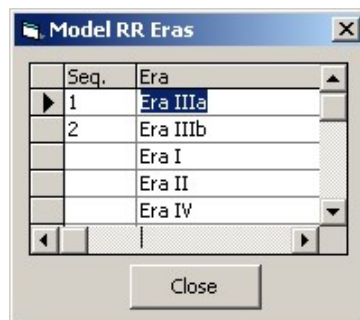
### Railroad Companies

To assign your engines to different railroad companies, this selection list allows you to maintain several of your favorite companies.



### Eras

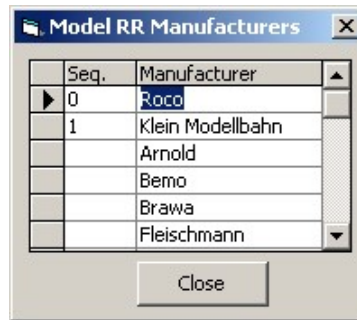
In many catalogues of model railroad manufacturers the engines will be categorized or sorted according to eras (also called periods).



The different eras which you may want to assign to your engines can be maintained in this selection list.

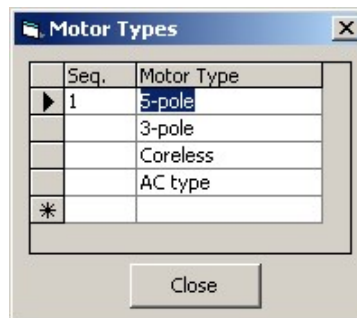
## Manufacturers

Of course it is necessary to assign your models to its manufacturer. The list of model railroad manufacturers can be organized and extended using this selection list window.



## Motor Types

The motor type (besides the gearbox and decoder) has a significant influence on the driving characteristics of an engine. In this selection list the different motor types for model locos (3-pole, 5-pole, coreless...) are managed.



## Program Options

### General

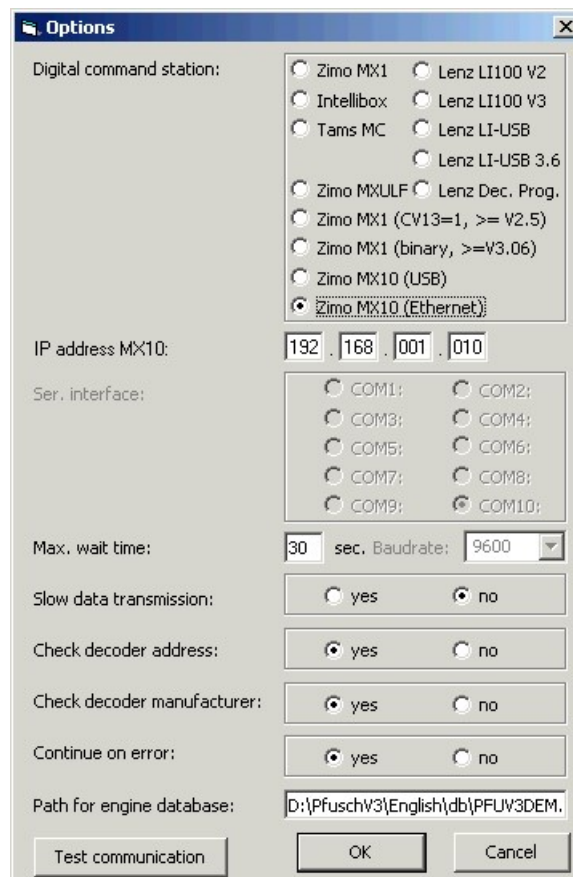
Parameters for data communication with the DCC system are maintained in the "Options" window. Most settings are made using so-called "radio buttons", i.e. only one out of two or more possible values can be selected.

If you click on **OK** after finishing your entries, all settings will come into effect, by clicking on **Cancel**, the original settings (which were active before the dialog window was opened) will be restored.

The functions "Engine Throttle" and "Switch-board" as well as the reading and writing of decoder data are only possible with a working connection to the DCC system.

Please note that in order to connect your computer to a DCC system a serial interface cable is necessary. It comes shipped with the LI100 Lenz interface, for the Zimo MX1 a cable with 1:1 connected wires is required (for more information consult the Zimo MX1 manual, the cable is available as accessory item from Zimo). This is also true for the Intellibox, details can be found in the Intellibox manual. The Tams MC and Lenz LI-USB interface, Lenz's DecoderProgrammer, as well as Zimo's MX10 and MXULF device are connected using a USB cable.

The following illustration shows ADaPT's standard settings:



In the following sections the items of this option window will be explained in detail one by one.

### Digital command station

Choose here, which digital command station you have connected to the PC. For the **Lenz system** an interface LI100 or LI-USB is required in addition to the LZ100 command station. For a **Zimo system** a MX1/M, MX1/MULT or MX1/2000 base unit will be required (MX1/Z will not work). For the **Intellibox** all currently available versions (including TwinCenter) are supported.



*If an MX1 has a software release 3.06 or higher installed, the last command station option, has to be chosen! Firmware revision 4 is not recommended for MX1!*

Note that **Zimo MX1ULF** and **Lenz Decoder Programmer (DecProg)** are connected via USB and do not need a separate digital command station.

### **IP address MX10**

If you have selected the **Zimo MX10 (Ethernet)** as digital command station, you have to enter the IP address of the MX10 here (see MX10 manual for details).

Please note that the current MX10 firmware does not allow communication with multiple programs from one PC, so parallel operation with STP on the same PC is not possible.

### **Serial interface**

Here you select, to which serial interface of the computer the digital command system will be connected to. ADaPT supports the standard interfaces **COM1: - COM10:**. COM-Ports that are not available on your computer are grayed out and cannot be selected.

Please make sure that the intended interface is not being used by another device (e.g. internal modem etc.). After changing the interface selection, the program should be shut down and started again to make sure that the changes will take place.

For the Lenz **LI-USB** interface, the **Tams** system, the **Zimo MXULF** and **MX10** and the **Lenz Decoder Programmer**, which are connected via the USB port of the PC, a so-called "virtual" serial port is automatically created by the driver software that comes with the interface (e.g. COM3:). Please check in this case after the installation of the LI-USB and the accompanying software, which new COM port has been created (this can be seen in the Windows Device Manager). The same COM port shown there must also be selected in ADaPT.

### **Maximum wait time**

This is the maximum time in seconds that the program will wait for a response of the DCC system after a request has been sent by the computer. Normally the system should respond within less than a second but because of numerous possibilities for delays - within the DCC system and within the computer - no value less than 5 should be entered here.



*A USB connection of the MX10 is currently not recommended!*



*Please note that normally a driver software (from an included CD) has to be installed when a USB device is connected to the PC for the first time. No other programs contained on that CD should be activated when running ADaPT.*



### **Baudrate**

On some DCC systems the transmission rate to the computer can be selected. By default this value is set to **9600** (for Intellibox to **2400**, for LI-USB and Lenz Decoder Programmer to **57600**). Please note that changing this value also requires you to change the baudrate setting of the DCC system to the same value. Especially for the Intellibox it is recommended to increase this value to **19200**.

---

**Note:** Whenever a DCC command station type is selected, the **Baudrate** is automatically adjusted to a default value for that system. For a MX1 command station using firmware 3.06 this can be 9600, 19200 or 38400 – in this case please make some tests to find the correct setting.

---

### **Slow data transmission**

If this setting is set to **yes**, after every read and write operation of a CV value a delay of one second is made. It is recommended to keep this setting on **yes**, since otherwise - especially on faster computers - data overrun problems may occur, which result in data transmission errors.

---

**Important note:** When reading from or writing into decoders or when using the online cab sometimes communication errors are shown, this setting should be set to **yes**. This especially applies when using a **Zimo MXULF** or **MX10**.

---

### **Check decoder address**

Before a configuration variable is read or written to, ADaPT can check whether the decoder address of the engine on the programming track matches the decoder address in the database. If this setting is put to **no**, the check will be suppressed. For safety reasons it is suggested to keep this setting on **yes**.

If decoders do not provide the possibility to read out configuration variables, put this setting to **no**.

### **Check decoder manufacturer**

As with the decoder address, ADaPT can also check whether the decoder on the programming track really is from the same manufacturer selected in the database. If this is not the case, a warning message will be displayed. Put this setting to **no** if no such check should be made (e.g. because you only have decoders of one manufacturer). For safety reasons it is suggested to keep this setting on **yes**. If decoders do not provide the possibility to read out of configuration variables, put this setting to **no**.

*No decoder address check is made when programming is done on the main track.*

*No manufacturer check is made when programming is done on the main track.*

### ***Continue on error***

Should an error occur during the readout or programming procedure of configuration variables, ADaPT normally interrupts the readout or writing process and shows a corresponding error message.

Put this setting to **yes** if you want to continue anyway in such cases. This is especially useful for decoders with acknowledgment difficulties.

### ***Path for engine database***

If after booting up ADaPT, you don't want to work with the standard engine database, but with a user created one instead, you can enter the path and filename into this entry field. Information about how to create your own databases is given under "Using Alternative Databases" on page 19. Changes in this field will become effective after the next program start.

### ***Communication test***

Click on this button to verify that the data connection to the DCC system works properly.

Make sure that a proper serial interface cable is connected to the DCC system, that this cable is put on the correct computer connector and that the DCC system is powered up and ready for operation. No engine or decoder has to be on the programming track for this test.

After clicking on the "Test Communication" button, a window similar to the one given below should be displayed.



The actual window content may differ due to current settings and the DCC system used.

---

**Important note:** When using the Intellibox or TwinCenter, please ensure that the interface under **Syntax** is set to **6050 and Intellibox** (explained in the Intellibox manual under General Settings / Menu item "Interface" / Syntax), using one of the other two settings (**Only 6050** or **Only Intellibox**) may prevent proper communication with ADaPT!

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# Decoder Programming

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## General Information

For many users the most important component of ADaPT will be the **programming window**. Here the assignment of decoder type and manufacturer as well as the setting and readout of configuration variables of the decoder is performed (programming dialog). You may also select individual variables that are to be written to or read out. The exact procedure is explained in detail under "Readout and Programming of Configuration Variables" on page 48.

Please note that with the current release of ADaPT no programming of accessory decoders (i.e. when the field **Type** in the database window is set to "Accessory") is possible. The programming of function decoders is fully supported.

## Window Layout

*The information about the properties of individual decoders was partly taken from manufacturer supplied material and may differ from actual decoder properties.*



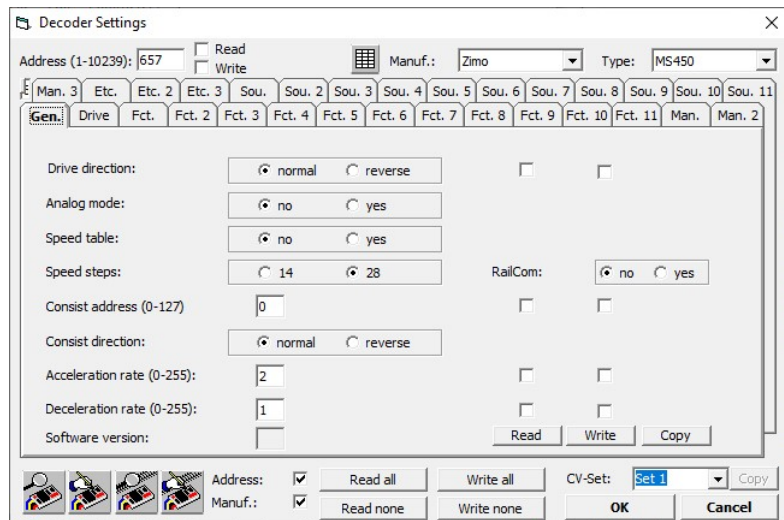
Because the configuration variables among individual decoders can be quite different from one another, an information file (decoder description file) for this decoder is processed every time a decoder type or manufacturer is assigned or changed. These files inform ADaPT about the properties of the decoder (number of speed steps, maximum address possible etc.) and which configuration variables the decoder supports.

For clearness sake the programming window has been separated into different overlapping regions (**register tabs** or **cards**):

- **General**: here the base settings of the decoder can be found (tab **Gen.**)
- **Driving**: these settings determine the driving characteristics of the decoder (not available for function decoders) (tab **Drive**)
- **Functions**: parameters, which influence the function outputs of the decoder (one or more tabs: **Fct.**, **Fct. 2**, **Fct. 3**, ...)

- **Manufacturer specific:** settings that are specific to this decoder type or manufacturer (none, one or more tabs: **Man.**, **Man. 2**, ...)
- **Others:** everything that does not match the four categories given above (none, one or more tabs: **Etc.**, **Etc. 2**, ...)
- **Sound:** all sound related settings, only relevant for sound decoders (none, one or more tabs: **Sou.**, **Sou. 2**, ...)

By clicking on the labels of each of the register tabs the corresponding region of the programming window is brought into foreground.



The first two register cards (General and Driving) are almost identical for all decoder types (depending on the type, one or more fields may be inaccessible, though). The following register cards (Functions, Manufacturer specific, Others and Sound) may differ strongly depending on the decoder type. A more detailed explanation of the important fields is given in the next sections.

Which property is shown in which register card, which fields are locked or accessible and which value ranges are allowed for the individual fields is defined in the decoder description file. Such a file is given for all decoder types supplied with ADaPT. For other (also not yet existing) decoder types such a description file may also be created or derived from an already existing file. More information about that is given under "Format of Decoder Description Files" on page 65.

When the mouse cursor hovers over a data entry field, a small window with a short explanation about the purpose of that field is shown in most cases. Additionally, when the mouse cursor is over a label of a data entry field, the confi-

*Some decoder manufacturers prefer to use hexadecimal or binary notation in the documentation of the settings of their configuration variables.*



guration variable number assigned by the NMRA or the decoder manufacturer is displayed.

By pressing the **F2** key in each data entry field a decimal / hexadecimal / binary **calculator** window may be opened. The given value may be altered in each number format given and will be copied back to the data entry field upon clicking on **OK**.

Most of the manufacturers have defined a default value which will be set into each field by ADaPT when choosing or changing the decoder type. If this default value should be restored after it has been changed, simply press the **F3** key in the appropriate data entry field.

The current **state** of each configuration variable is indicated by the color of the digits in the individual data entry field. The following colors are possible:

- **black**: the value was created or altered manually or was taken as default right from the decoder description file
- **blue**: the value was read out of the decoder or programmed successfully into the decoder (on the programming track)
- **red**: an error has occurred while programming the value into the decoder.

As usual with Windows software, all changes made in the programming window will be saved into the engine database when the **OK** button is clicked. By clicking on **Cancel**, the previous state before the programming window was opened is restored (all programming operations made to the decoder though will remain stored in the decoder).

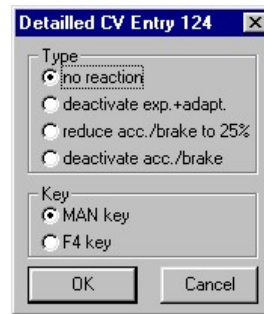


If a configuration variable entry field has a grey background (instead of white), this field is a "display only" field, i.e. the value can be read from the decoder, but it cannot be altered.

### **Bit Variables**

Depending on the decoder type, some configuration variables are separated into bits, where each or a group of them have different meanings. To simplify the entry of these values, ADaPT shows a special button (⌘) next to those data entry fields.

When clicking on this button, a dialog window similar to the figure below will open (different for each variable).



By selecting from different options or by entering different values in this window, the current value of the configuration variable can be modified and (by clicking on **OK**) transferred to the data entry field in the **Decoder Settings** window. Clicking on **Cancel** will leave the value in that window unchanged.

### Decoder Address

*When an already existing address is entered into the database, an error message will be given when the programming window is closed.*

The decoder address will automatically be copied from the database main window. On the left of the address label the valid address range is shown. Please note that an address change in the programming window is allowed and will be copied to the database main window upon successful closing of the programming window. The address may also change by a readout operation from the decoder (although normally in that case a warning message is given, see also "Check decoder address" on page 35).



Please note also that the DCC system used may have a limited decoder address range (Lenz V2: 1-99, V3: 1-9999, Intelibox: 1-9999, Zimo: 1-10239, Tams: 1-10239).

### Decoder Manufacturer

The **manufacturer** of the decoder to be programmed can be selected using the accordingly labelled selection list. By clicking on the black arrow on the right of the data entry field a corresponding table with the available brand names is shown. Please note that the entry of a manufacturer using the keyboard is not possible.

After selecting a manufacturer by clicking on the appropriate entry in the selection list the first decoder type of that manufacturer will be shown in the **Type** field and the corresponding decoder description file will be loaded. All data entry fields for configuration variables will be reset to their default values.

### Decoder Type

In the **Type** data entry field the decoder type installed in the current engine is selected. By clicking on the black arrow on

the right side of the data field a selection window will be opened, which lists all decoder types of the currently set decoder manufacturer. Please note that the entry of a decoder type using the keyboard is not possible.

After selecting the decoder type the corresponding **decoder description file** will be loaded. All data entry fields for configuration variables will be reset to their default values.

---

## The Programming Window

*To switch the register cards, just click on the corresponding label on the top of the tab to be activated.*

### Decoder Data 'General'

The register card "General" contains all **basic settings** which are supported by almost every NMRA compatible decoder available. A picture of this register card is given under "Window Layout" on page 37.

In the following the several fields of this register card are explained in more detail.

#### **Drive direction**

Changing of the driving direction without having to resolder the decoder connection leads to the motor. The direction dependent lights will also be reversed. The switching is only effective when the decoder is operated in digital mode.

#### **Analog mode**

Defines, whether the decoder should be operational with a normal DC power supply, i.e. when no digital signal is present on the track.

#### **Speed table**

If turned on, the driving characteristics of the decoder (i.e. the relation of current throttle position to actual engine speed) is determined by a speed table (see "Speed table" on page 43).

This field is also present on the "Driving" register card, where the speed table setup can also be performed.

#### **Speed steps**

Here you can select whether the decoder should be controlled using 14 or 28 speed steps. If both digital command station and decoder are capable of 28 speed step mode, this setting should always be used. The field is also present on the "Driving" register card.

Please note that this adjustment must also be done on most DCC command stations (not just the decoder) for each decoder address. It is usually performed through the cab. The



*Lenz digital command system is capable of 128 speed step mode starting with software release 3.0.*



speed step setting in the decoder and the command station must be identical.

The 128 speed step mode (if decoder and digital command station are capable of this mode) will be used automatically and does not have to be configured on the decoder. In general however, the command station needs to be programmed to operate in the 128 speed step mode.

For decoders supporting RailCom™ an additional data entry field is shown which turns the RailCom functionality on or off.

### **Consist address**

The consist address (range 1 – 127, may be less on some decoders) can be used alternatively to the main address. It may be assigned to several decoders simultaneously, so that they all can be accessed under the same consist address (i.e. for **MU-ing**).

A value of "0" means that no consist address is active. Please note that many digital command systems offer alternative ways of building consists.

### **Consist direction**

If a consist address has been entered, this setting will reverse the driving direction of the affected decoder when operated in the consist mode..

### **Acceleration rate**

Delay when increasing the speed of the loco to match the current speed setting of the engine throttle (also referred to as inertia or mass simulation). A value of "0" means no delay. The actual delay used (i.e. the formula to calculate the time from the value entered) as well as its maximum value are decoder dependent.

### **Deceleration rate**

Similar to the acceleration rate (see under "Acceleration rate" on page 42), but effective when slowing down, i.e. when braking.

### **Decoder Data 'Driving'**

The register card "Driving" is mostly responsible for settings which influence the relationship "throttle setting" to "actual engine speed". In its simplest case, this relation is a linear one, i.e. the throttle setting is mapped 1:1 to the speed steps of the decoder.

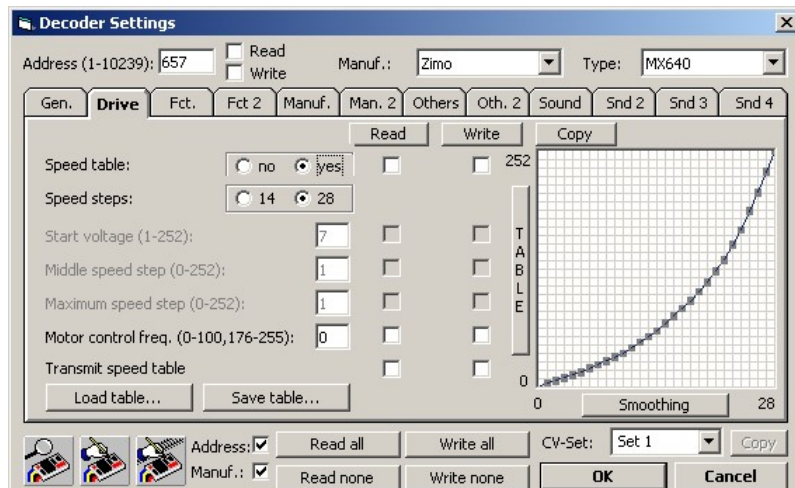
Adaptations can be made in one of two ways:

*Note that the register card 'Driving' is not available for function decoders.*

- **three point curve**
- **speed table**

*Not alle decoders support middle and maximum speed step settings. Also the speed table may be unavailable.*

In the first case the start voltage, middle speed and maximum speed can be defined. In the second case a table containing 14 or 28 values can be set up, which offers a still more flexible way to map throttle settings to decoder speed steps.



The fields **speed table** und **speed steps** are also available on the "General" register card and may be altered here as well as there.

### **Speed table**

If activated, the drive characteristics of the decoder (i.e. the mapping of throttle position to real engine speed) are calculated using the speed table.

If the speed table has been activated, the mouse can be used to "drag" the grey squares (by clicking on them and moving the mouse while keeping the left mouse button pressed) in the **graphical window** on the right side and so "draw" the speed curve as intended.

Note that ADaPT will automatically make corrections if you try to draw a "descending" speed curve (i.e. if a higher throttle position would translate in a lower engine speed) whenever you release the mouse button.

If the drawing results in a bumpy curve, it can be corrected automatically by clicking on the **Smoothing** button. If necessary, this function can be applied several times.

*Complete decoder settings from one engine may be copied to another engine (normally only meaningful if the same decoder type is used) using the copy function in the database window, see "Copying an Engine" on page 21.*

The buttons **Load table...** and **Save table...** are available to repeatedly use previously defined speed tables or to save a just defined table permanently for the same purpose (as a file in the `speedtab` subdirectory). Two different curve types (linear and hyperbolic) are included in ADaPT.

Please note that the resulting engine speed also depends on other factors (motor, gearbox) so that a **calibration** of engines can only be made by adequate test drives.

Using the **TABLE** button opens a new dialog window, which allows the speed table values to be changed numerically.

### **Speed steps**

Here you may select whether the decoder should be controlled using 14 or 28 speed steps. If the digital command station is capable of 28 steps, this mode should always be used. Additional information can be found under "Speed steps" on page 41.

### **Start voltage**

This value defines the minimum speed at the **lowest speed step** (1). This setting can help to improve the slow speed characteristics especially with older motors or high friction gears. A value of "0" means that no specific voltage level should be used. The value range and maximum value for this field are decoder dependent.

This and the two next settings are only available (and effective) if the speed table is deactivated. A graphical entry in the speed curve window is nonetheless possible if a non-zero value is entered in the corresponding data entry field. The start voltage is represented by the small grey square on the left side of the graphic window.

### **Middle speed step**

This setting allows for an easy setup of a **non-linear speed characteristic** (e.g. smaller speed steps in the low speed area, coarser steps in the high speed range), without using the speed table function. It represents the decoder speed step for a 50% (middle) throttle setting. A value of "0" or "1" means a deactivation of this setting. The value range and maximum value for this field are decoder dependent.

This parameter may also be set in the graphic window using the mouse, as long as a value different from "0" and "1" is present in the data entry field. The middle speed step is represented by the grey square in the center of the window.



*Even when the maximum speed has been reduced, the full throttle range remains available on the controller.*

### **Maximum speed step**

The most often used setting for engine decoders will be the maximum speed since it allows to slow down engines to a more prototypical top speed, which is often for too high as they come out of the box.

A value of "0" or "1" means that the maximum speed should not be reduced. Again the available value range is decoder dependent.

This setting may also be altered in the graphic window using the mouse, as long as a value different from "0" or "1" is present in the corresponding data entry field. The maximum speed is represented by the grey square on the right side of the graphic window.

### **Motor control frequency**

The frequency with which a motor is driven by a decoder can be adjusted on some decoders (especially on decoders with motor control). A distinction is made between low (0 – 1 kHz) and high (> 10kHz) frequency drives. .

*High performance motors especially gain from high frequency control.*

Because different motor types and -brands react quite differently to the various control frequencies, this value can often be modified. For more information on that subject (value range and translation formula value - frequency) please consult the operation manual of your decoder.

### **Decoder Data 'Functions'**

In the register cards "Functions" ("Fct.", "Fct. 2, ...") many settings which influence the control of the decoder's function outputs (lights, additional functions) are present.

Since some functions (especially for "FX"-type decoders) are configured by manufacturer specific configuration variables, the settings for these effects are normally not shown here but rather on the "Manuf. specific" register card (see "Decoder Data 'Manufacturer specific'" on page 46).

### **Decoder specific fields**

The setup for function assignments differs significantly between decoder types, which means that the data entry fields for this register card are mainly defined by the decoder description file. For space reasons not all possibilities are shown here.

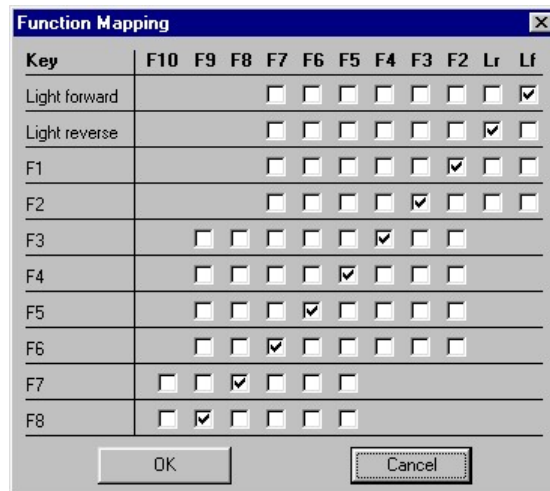
To obtain more information about the possible settings in this area please consult the operation manual of your engine decoder.

### Function mapping table

For maximum flexibility in assigning the function keys of your handheld to function outputs of the decoder, the NMRA provided a possibility for a function mapping table in the decoder.

*The function mapping table mainly is provided by large scale decoders, because they offer a bigger number of function outputs.*

This method, which is only provided by some decoders, allows an (almost) arbitrary assignment of decoder outputs to controller buttons. The setting is normally set up using several configuration variables. For a more convenient way to enter it, AdaPT provides a specific dialog window, which can be opened by clicking on the **Function mapping** button.



*As you can see on the picture, not all theoretically possible combinations are allowed, so e.g. the light output front / rear can not be switched using function keys F3 - F8.*

In this window you can decide, which key on the handheld (arranged vertically) should trigger which function output of the decoder (arranged horizontally). Selected combinations are displayed by a tick mark (✓) in the corresponding white square. The picture above shows the standard assignment, but it is also possible to put more than one tick mark in one row or line.

### Decoder Data 'Manufacturer specific'

When the configuration variables definition was done by the NMRA, ranges of variables (e.g. CV49 - CV65) remained reserved for manufacturer or decoder type specific settings.

The corresponding data entry fields according to the decoder definition file are grouped together in this register card. For a detailed explanation of the possible settings and value ranges in this area, please consult the operation manual of your decoder.

### Decoder Data 'Others'

All configuration variables that could not be assigned to other register cards (due to thematic reasons or simply because no place was left there) can be found under the register

tabs "Etc.", "Etc. 2", .... The possible settings in this area are defined by the decoder configuration file and differ considerably between decoder types.

*Note that some CVs, such as error information, can only be read out but not altered or overwritten.*

Typically configurations about driving characteristics (e.g. trim) or settings without direct influence on the behaviour of the decoder (error information, user definable entries) can be found here.

For a detailed explanation of the possible settings and value ranges in this area, please consult the operation manual of your decoder.

### Decoder Data 'Sound'



For decoders with sound functionality the register tabs "Sou.", "Sou 2", ... group all settings which are related to sound playback of the decoder.

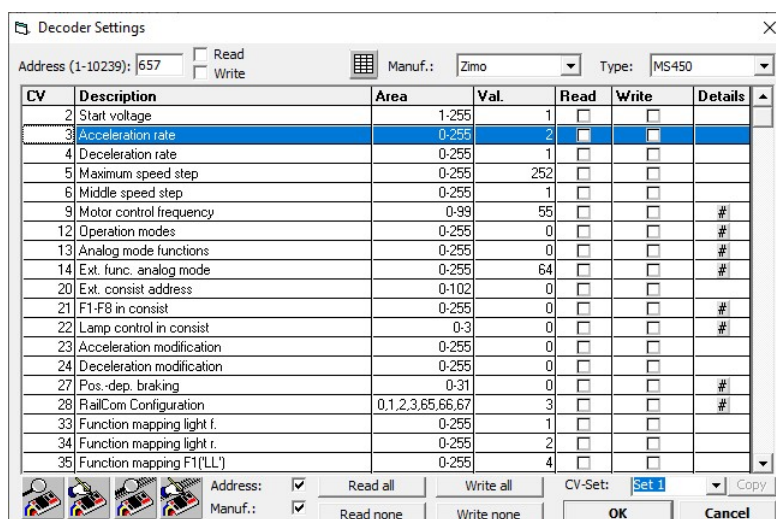
Please note that ADaPT cannot install sound files into the decoder because every manufacturer uses their own protocol, which is often not available and requires special hardware.


## Tabular view of Configuration Values

*New in ADaPT V4.0*

As the number of configuration values in decoders is rising continuously (even beyond thousand), which cannot be shown clearly in the “tabbed” view, a new **tabular view** of CVs was introduced with AdaPT V4.

Note that the tabular view shows **all CVs** which are defined in the decoder’s definition file, whereas the tabbed view has a limit of around 550 CVs which can be shown.



To switch between the tabbed and the tabular based views click at the  button in the top center part of the programming dialog window.

The meaning of the individual columns of the table is identical to those in the tabbed view and also the handling is similar.

To change a value, click at the proper cell in the **Val.** column and enter the desired value. If the cell is active to enter data (yellow background), the proper help text will be shown if the mouse cursor is moved in or into the cell. Using the **F2** key a calculator window (decimal – binary – hexadecimal) is opened.

**Note:** If a value cell for data entry is still active, it has to be left (Enter key, Tab-key, clicking at another cell in the table) before switching back to the tabbed view.





Clicking at the ESC key will close the whole programming window without saving the changes!

To mark several CVs for reading or writing, multiple rows in the table can be selected (move mouse cursor to the first desired line, click and hold left mouse button, move cursor to last desired line, release mouse button) and then selected for the operation by clicking at **Read** or **Write** in the title row.

---

## Readout and Programming of Configuration Variables

Readout and programming of decoders are accomplished by the three following functions of ADaPT:

-  readout from decoder on programming track
-  write to decoder on programming track
-  read from decoder on main track (only MX10 with RailCom enabled decoders)
-  write to decoder on main track



The respective function is activated by clicking the corresponding button in the lower left corner of the programming window. Please note that programming on the main track is not supported with all command stations or software releases.

**Important:** Before a readout or write action can be performed, you have to select, which settings should be transmitted to / from the decoder.

*The data field "address" also contains such markers.*

There are two small square boxes to the right of every configuration variable data entry field, which will show a tick mark (✓) when clicked upon. Another click will remove the mark. For the speed table in the register card "Driving" there is a separate entry (**transmit speed table**) available.

**Note:** Because some decoder settings, such as **driving direction**, **speed steps**, **analog mode** und **speed table Y/N** are stored in the decoder in a single configuration variable (CV 29), these parameters can only be read out or written together and thus share a common read / write marker.

If a box in the **left** marker column now has a tick mark set, this configuration variable will be read out from the decoder in the next **readout** operation and its value will be displayed in the corresponding data entry field.

If a tick mark is set in a box in the **right** column, the current settings will be written into the decoder with the next **write** operation (no matter whether the programming is performed on the programming or on the main track).

To accelerate this selection process, every register card has a general **Read** and **Write** button. Clicking on one of these two buttons activates the read resp. write markers for all configuration variables on this register card.

Additionally, on the lower border of the programming window you will find the buttons **Read all**, **Write all**, **Read none** and **Write none**, which globally refer to all configuration variables of this decoder (the last two buttons remove the tick marks from all read resp. write markers).


The options **Address:** and **Manuf.:** on the right side next to the "Decoder Read"- and "Write"-symbols allows you to turn the options for checking of address (option **Address** selected) and checking of decoder manufacturer (option **Manuf.** selected) on or off at any time (see also "Check decoder address" on page 35).

If the manufacturer check option is selected, the field Software version will show the current version of the decoder's software (CV7).

Starting with ADaPT Rel 3.1 decoders with "indexed" configuration variables (like ESU LokSound V4, V5) can be programmed directly, i.e. the setting of specific "index" or "page" registers / CVs to access certain CV areas is done automatically by ADaPT.

## Reading of Decoder Data



By clicking on the button  all configuration variables which have been marked in the “read box” will be read from the decoder and its values displayed in the corresponding data entry fields of the programming window. Reading out the decoder is only possible with the engine on the programming track or the decoder connected to the programming track output.



*If the readout of data from a decoder should not be possible, this does not imply that the writing of data is also impossible.*

When using the MX10 command station and a RailCom enabled decoder is used (and RailCom ist activated on the MX10, i.e. no MX9 modules are connected!), reading of



CVs is also possible on the main track by clicking at .

Not all decoders allow the readout of information. Additionally for an effective readout certain conditions have to be met (motor or front lights have to be connected to the decoder). If you encounter problems, please consult the manual of your decoder or your digital command system for further instructions. For decoders that can't acknowledge commands or if neither motor nor lights are connected, it is recommended to turn off the option for checking the decoder address and manufacturer (described under "Program Options" on page 32).

After clicking on the "read" button, a window will be shown, which displays read-out information and its process. By clicking on the **Cancel** button the readout process can be terminated at any time. Configuration variable values that have been read successfully will be displayed in blue.

*Whether decoder address and manufacturer are checked is determined by settings of the program options, see also "Program Options" on page 32.*


If any problems with the data communication to or from the digital system should arise or if the decoder address or manufacturer does not match the settings reported by the decoder, an appropriate error message will be displayed. In the two latter cases, the readout process can nevertheless be continued by clicking on **OK**.

Note that in case of problems the option **Slow data transmission** under **Options** could be set to **yes**.

## Programming of Decoders

To write the value of all marked configuration variables to



the decoder, click on the icon . For this operation to be successful, the locomotive must be on the programming track or the decoder connected to the programming track output.

After clicking on the "write" button, a window will be shown which displays information about the status of the

programming process. By clicking on the **Cancel** button, the write process can be terminated at any time.

If the decoder can be read out (i.e. see "Reading of Decoder Data" on page 50), each successful write operation is acknowledged by the decoder and the content of the corresponding data entry fields will be displayed in blue. If there is no acknowledgement from the decoder, the content of the data entry fields will be shown in red to indicate a possible problem when writing this configuration variable.

*Whether decoder address and manufacturer are checked is determined by settings of the program options, see also "Program Options" on page 32.*


If any problems with the data communication to or from the digital system should arise or if the decoder address or manufacturer does not match the settings reported by the decoder, an appropriate error message will be displayed. In the two latter cases, the write process can nevertheless be continued by clicking on **OK**.

### Programming Decoders on the Main Track

*For safety reasons the decoder address cannot be altered when programming on the main track.*

Similar to the writing of decoder information on the programming track, this function transmits all configuration variables marked for writing to the decoder, which - for that purpose - has to be present on the normal **(main) track**.



This function is activated by clicking on the symbol . It is only available for digital command systems which support that kind of programming.

Because of lacking acknowledgement (readout) capability when programming on the main track, no checks (manufacturer, address) will be performed and the digits in the data entry fields will not be colored blue or red, which would indicate programming success or failure.

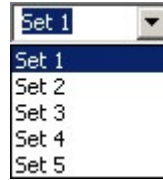
### CV Sets



In addition to the current value of every configuration variable, ADaPT can store up to four additional values for each decoder address (**CV sets**). This feature is very handy when an engine is used under different operating scenarios (shunting, line operation ...) or if it used on different layouts (at home, club etc.), which would require different CV settings for each of these environments.

By default **Set 1** is active, which can be seen by checking the field **CV-set** in the lower right corner of the decoder parameterization window.

To activate a different CV set, open the list of CV sets and select the desired set:



*Whenever a new CV set is used, activate the **Copy** function first, otherwise possibly invalid CV values (0) could be programmed.*

It is possible to change the name of the set (e.g. to "Shunting") by just typing the new name into the data entry field at the top of the list. Using the **Copy** button on the right of the CV set list the values of set 1 can be copied into the currently selected set (otherwise all CV values are set to 0 by default!)

If a CV set is selected, this selection is stored along with the decoder values, so the next time when the programming dialog is opened for this decoder address the CV set which has been selected the last time will be active again.

---

**Note:** Some decoders (Zimo, Tran) have a similar functionality implemented within the decoder itself. This functionality is not connected to ADaPT CV sets, so these sets are not converted into ADaPT CV sets and also not the other way.

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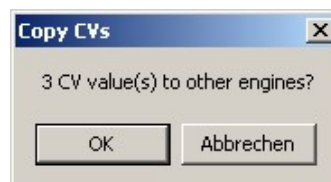
### Global Changes of Configuration Variables

Sometimes it can be very practical to apply some configuration settings not just to one but to a list of engines.

A good example would be braking values which were determined for a loco type through a series of test drives and then should be applied to all similar engines.

This is possible using the global copy function. It is important that before opening the programming dialog all engines which should receive the changes have been selected using the filter function (see "Filtering of Information" on page 23). This could be all engines of a certain manufacturer and / or motor type or a specific series. If no filtering is made, the change(s) will be applied to all engines in the database.

Afterwards for all values that should be copied a tick mark has to be set in the **Write** column and the **Copy** button (next to the **CV-set** field) has to be clicked at. A popup window opens and requests a confirmation if the copy operation should be executed:



By clicking at **OK** all values (of all sets) with a tick mark in the **Write** column will be copied from the current engine to



the previously filtered engine database records (without filtering into every record).

---

**Note:** Through this operation the selected values will be copied within the database, **no** actual decoder programming is being performed! Also note that even when the programming dialog is closed using the **Cancel** button, global changes already performed will not be revoked.

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# Driving and Switching

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## General Information

*Engine throttles and switchboards are not available with the shareware release of ADaPT. Also when using the Lenz DecoderProgrammer, these functions are not available.*

*Up to 16 engine throttles and 16 switchboards may be held open simultaneously.*

**Engine throttles** and **switchboards** (in the remaining text also commonly called control windows) are used to operate engine (i.e. loco) or accessory decoders. Which of these two control panels are used for a given engine / decoder is determined by the field **Type** in the database window. For the type "Engine" and "Others" an engine throttle, for "Accessory" a switchboard window is used.



Clicking on this icon opens an engine throttle, clicking



on this icon opens a switchboard window, both buttons are located in the lower right part of the database window. Each time a control window is opened, it will be for the engine or decoder address currently displayed in the database window. If a control window for that address has been activated earlier (and is still open), that window will be brought to the foreground; no new window will be opened.

Every control window shows the short name and decoder address of the selected engine in the upper part of the window. By clicking on the **Close** button the control window closes without changing the last throttle settings.

Please note that a working data connection to the DCC system must be in place before a control window is opened (see also "Communication" on page 36) because the current settings of the selected decoder will be read out from the DCC system and displayed in the control window. A control window will be opened even if communication with the command station is not possible, after a predefined waiting time has elapsed, but without proper data communication it will not be possible to actually use the control window.

---

## The Engine Throttle

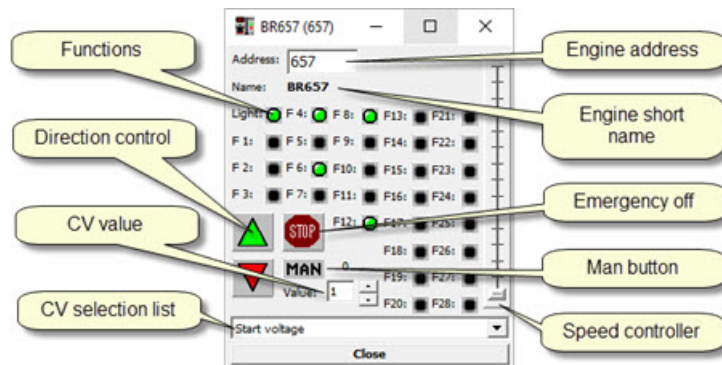
*New in ADaPT V4.0*



### Window Layout

The layout of the engine throttle window is adapted from commonly used conventional digital handhelds. It allows the control of **driving direction, speed** and up to 28 **additional functions**.

Equally an **emergency off** (works on all engines) and a **MAN** button have been incorporated. The latter is only operational in conjunction with a Zimo DCC system and corresponds with the identically named button on the Zimo handheld.



All buttons may be operated with the mouse, although for the speed slider a keyboard operation (using the arrow and PgUp/PgDn keys) is also possible.

### Changing the Direction

The current driving direction is indicated and changed by the **buttons with triangular shaped icons**, the green triangle shows the current driving direction. A mouse click on the button showing the red triangle inverts the current driving direction.

Please note that the engine throttle by itself will not make any speed adjustments before changing the driving direction; the deceleration before and accelerating after the direction change are determined by the corresponding CV settings in the loco decoder. For safety reasons it is recommended to put the speed slider to zero before any direction change command is issued.

### Changing the Speed

The **speed slider** has a resolution of 128 steps; the current speed step will be shown as numerical expression in a field just above the **Close** button. Besides operation via keyboard (arrow and page keys) the slider can also be operated using

the mouse by clicking on the horizontal bar and moving it up or down while keeping the left mouse button pressed.

### Switching of Function Outputs

The **functions** (in the engine throttle termed "Light" and "F1" - "F28") are activated or deactivated by simply clicking on the corresponding button. An activated function will be displayed by a green light appearing within the button.

Which button operates what function of a decoder is determined by the decoder type, its wiring and the programming of the corresponding configuration variables.

**Note:** Depending on decoder type and central unit it is possible that less than 28 functions can be controlled. In this case fewer function buttons are shown in the cab.

### Emergency Off

In emergency cases it should be possible to quickly stop all engines in operation. A special **emergency off (STOP)** button is available for that purpose.

By clicking on this button, all engines on the layout will be stopped immediately and the symbol of the button will change into a green **Go** icon. Another click on this button will terminate the "emergency off" condition and all engines will resume their original speed and direction.

### The "MAN" Button



Clicking on this button switches the engine or decoder controlled by this throttle into a special **MAN**(ual) mode, which turns off the signal controlled speed influence. This function is only available in conjunction with the Zimo digital command system and is explained in more detail in the Zimo operation manual.

An active MAN mode is indicated by a red MAN button and can be deactivated by clicking on it again.

### Changing Configuration Variables



Individual CV's can be fine-tuned by changing the values directly in this throttle – if the DCC command station and the decoder supports programming on the main (POM)..

This is especially helpful for adjustments of acceleration and deceleration values (momentum), optimization of motor control parameters, but also function and sound adjustments are easier when the result can be checked immediately.

To change a configuration variable, select the desired variable from the selection list in the lower part of the engine throttle.

*This list is specific to the decoder type used in the engine.*

The currently stored value of the selected configuration variable of the active CV set will then be shown in the **Value** field. This value can now be changed in the range from 0 to 255 by clicking at the arrow-up or arrow-down buttons on the right of the value field. The change will immediately be programmed into the decoder.

The changed value(s) will be saved in the engine database when the engine throttle window is closed. So it is not recommended to have the programming dialog window open simultaneously with the throttle window, as inconsistent values for CVs could be shown.

---

**Note:** It should be considered that by changing the value of a configuration variable in this way, the value range of the CV will not be checked for validity, so arbitrary (even invalid) values could be programmed into the decoder. Due to this (and also because the value can only be changed incrementally) it makes no sense to alter bit-coded values (i.e. CV #29) in this way – only "continuous" values.

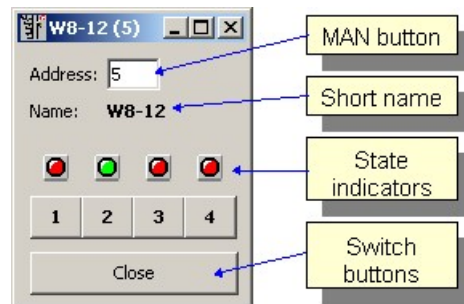
---

## The Switchboard

*An output in this context always refers to a paired connection, i.e. two control leads, which are mutually activated.*

### Window Layout

The switchboard window serves as control for accessory decoders (also called switch decoders or turnout decoders) with up to 4 **outputs**, which means that up to four turnouts or four signals (each with two indicator lamps, i.e. red / green) can be operated.



Besides the decoder address and short name also the current state of the single outputs is shown (red / green).

Note that for the Zimo DCC system and the Intellibox the allowed range of accessory decoder addresses is from 1 to 511, whereas for the Lenz system the address range is 1 to 255.

### Switching Operation

To switch the individual outputs, click on the colored state indicators or on the numbered buttons below. Alternatively,



by pressing one of the number keys **1 - 4** the corresponding output will also be switched to the opposite state.

### **Differences Caused by Decoder Type**

The assignment of addresses and output numbers is handled quite differently between decoder types and manufacturers. Zimo's switch decoder MX81/N for instance has only one output, which is additionally specified by a so-called sub-address (1-4). This sub-address represents one of the output numbers in this switchboard window. Thus, with one switchboard window up to four MX81/N switch decoders (with the same main address, but different sub-addresses) may be accessed simultaneously. In case of doubt please consult the operating manual that came with your accessory decoder.

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# Addendum

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## Problem Survival Guide

In the following chapter you will find additional help in case things do not work quite the way they are described here.

The most important aspect in down pinning a problem is the systematic approach, here explained on the example of a non-working data communication to the DCC system (error message "no data received from digital command station!")

- repeat the process
- check if the connection to the control system is intact (see "Communication " on page 36).
- change the setting **Slow data transmission in Options** to **yes** (see "Slow data transmission" on page 35)
- close all other simultaneously running programs
- switch your DCC system off and on again
- check the cable connection according to the manual of your DCC system
- check the data transmission speed (see "Baudrate" on page 35 and ensure (when using the Intellibox) that **Interface / Syntax** is set to **6050 and Intellibox**)
- try to repeat the action you wanted to do without a computer (using the DCC system by itself)
- shut down your PC, restart it and retry the operation

For some repeatedly asked questions (FAQ) you will find additional help and specific guidelines in the following:

**Q:** The program cannot be installed. What can I do?

**A:** Start Windows in "Safe Mode" by pressing the F8 key during startup (before the Windows start screen is shown) and select **Safe mode** from the menu. Install ADaPT in this mode and then restart the computer in normal mode.

**Q:** When starting ADaPT (or opening the programming / engine throttle / switchboard window) I get a message indicating that the serial interface (COM1: ,COM2: ...) cannot be accessed. What does that mean?

**A:** The selected interface for the communication to the digital system is already occupied by another program (driver) or hardware component. Try to select the other serial interface port (see "Serial interface" on page 34) or deactivate or delete the interfering software or hardware component.

**Q:** What exactly does the message "Address locked - programming not possible" mean?

**A:** When programming is done on the main track (using the Zimo command station) it may happen that the engine address is active on a handheld at the same time. In that case the address on the handheld has to be deactivated before the programming can be resumed.

**Q:** My decoder is capable of 128 speed steps. In ADaPT I can only select 14 or 28 speed steps. How do I activate the 128 step mode?

**A:** The 128 speed step mode - as long as it is sent out from the command station - is automatically detected by the decoder and cannot be selected through configuration variables.

**Q:** The assignment of the configuration variables (or their value range) does not conform to the decoder description file supplied with ADaPT. How is this possible?

**A:** Some of the decoder description files supplied with ADaPT were received by the decoder manufacturer and assumed to be true. If this information was incorrect, differences may occur. Additionally manufacturers change or extend their products during their life cycle, which also may cause differences. Please report such observations to the address given below, so that it can be considered for future releases of ADaPT.

**F:** Under decoder manufacturer „Roco" I can only find older decoder models. Where are the current decoders?

**A:** Current Roco decoders are produced by Zimo, so the corresponding Zimo decoders should be used in ADaPT. For many Roco decoders the equivalent Zimo model is mentioned in the decoder manual.

**Q:** When programming / reading out my Arnold / Kuehn / Tran decoder, I always get the message "Different decoder manufacturer". Why?

**A:** Some loco decoders from Arnold were delivered with a wrong manufacturer identification number (Lenz). In case you own such a decoder make sure that either the manufacturer check is turned off (**Parameters / Options**) or recreate this decoder type under manufacturer Lenz. The manufacturers Kuehn and Tran delivered decoders of early pro-

duction date with different manufacturer codes (0 or 13). Disable the manufacturer check in these cases as well.

**Q:** May I continue to use my engine database after a program update?

**A:** Yes, see "Installation of an Update" on page 7. If the original database has contained more than three records and you switch to a shareware release, only the first three records will be accessible.

If your problem should not be solvable with the guidelines given here, you may also contact the author directly:

Dipl.-Ing. Ewald Sperrer  
Software-Entwicklung  
Weißenberg 23  
A-4053 HAID / AUSTRIA  
E-mail: info@stp-software.at

Please do not forget to include the following informations:

- operating system used on the PC
- processor type and size of main memory (RAM)
- DCC system used (+ software release)
- a short description of the error and a way to reproduce it
- copy or printout of the file PFUSCH.INI (located in the ADaPT installation directory)
- If not too large (< 3 MB) a copy of the engine database (file PFUSCHV3.MDB in the DB subdirectory), compressed, either on an external storage media or as e-mail attachment.

Missing information may lead to further inquiries and thus delay the processing.

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## Software Limits

ADaPT currently has the following maximum values/limits:

<b>Description</b>	<b>Value</b>
Maximum size of database	2 GB
Maximum number of open engine throttles	16
Number of functions per engine throttle	28
Maximum number of open switchboards	16
Number of switch functions per switchboard	4
Maximum number of decoder manufacturers	255
Maximum number of decoder types	unlimited <sup>*)</sup>
Number of programmable configuration variables	5120 <sup>**)</sup>

Number of user defined configuration variables	~1000
Maximum number of internal decoder speed steps	255

\*) i.e. only limited by computer resources (main and hard disk memory).

\*\*\*) 1024 „base“ CVs + 16 pages each 256 CVs („Mapped CVs“) – partly only available in the CV list view

## Database Structure

All information about engines is kept in the Access™ database (Microsoft JET engine) in the table LOCO\_DAT, which has the following structure:

Description	Name	Data Type	Bytes
Record number *)	DC_RECNO	Long	4
Address *)	DC_ADR	Long	4
Short Name *)	ST_SNAME	Text	6
Description	FZ_LNAME	Text	40
Type	DC_TYPE	Byte	1
Engine type	FZ_FTYPE	Text	16
Series	FZ_CODE	Text	12
Operation #	FZ_OPCODE	Text	8
Maximum speed	FZ_MAXSPEED	Integer	2
RR company	FZ_LINE	Text	16
Era	FZ_ERA	Text	16
Manufacturer	MD_MANUF	Text	16
Catalogue #	MD_CATNO	Text	16
Scale	MD_SCALE	Text	16
Price	MD_PRICE	Currency	8
Motor type	MD_MOTOR	Text	16
Remark	MD_INFO	Text	240
Reserved	MD_FILLER	Text	32
Image	MD_PIC	Long Binary	
Decoder manufacturer	DC_MANUF	Integer	2
Decoder type	DC_DECODER	Text	16
Configuration variables set 1	DC_CV	Long Binary	1024
State of configuration variables set 1	DC_CV_ST	Long Binary	1024
Engine group	ST_GROUP	Byte	1

User info 1	MD_USER_1	Text	40
User info 2	MD_USER_2	Text	40
User info 3	MD_USER_3	Text	40
Configuration variables set 2	DC_CV_1	Long Binary	1024 **)
State of configuration variables set 2	DC_CV_1_ST	Long Binary	1024 **)
Configuration variables set 3	DC_CV_2	Long Binary	1024 **)
State of configuration variables set 3	DC_CV_2_ST	Long Binary	1024 **)
Configuration variables set 4	DC_CV_3	Long Binary	1024 **)
State of configuration variables set 4	DC_CV_3_ST	Long Binary	1024 **)
Configuration variables set 5	DC_CV_4	Long Binary	1024 **)
State of configuration variables set 5	DC_CV_4_ST	Long Binary	1024 **)
Decoder revision	DC_DEC_VER	Text	16
Descr. CV set 1	DC_CV_NAME_1	Text	8
Descr. CV set 2	DC_CV_NAME_2	Text	8
Descr. CV set 3	DC_CV_NAME_3	Text	8
Descr. CV set 4	DC_CV_NAME_4	Text	8
Descr. CV set 5	DC_CV_NAME_5	Text	8

Remarks: \*) mandatory field, has to be entered

\*\*) Could be longer of decoder uses mapping

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## Format of Decoder Description Files

The decoder description files contain technical information and descriptions about the configuration variables of the different decoder types. The file names correspond with the decoder type names given in the decoder type selection list (see also "Decoder Types" on page 29), completed by the file name extension ".DEC" (e.g. MX620.DEC).

The location for the decoder description files is in the sub-directory of the decoder manufacturer (e.g. C:\pfusch\zimo\mx620.dec). This file can be edited with any "standard" text editor (e.g. Windows Notepad) and can be used as a base for modifications.

The layout of a decoder description file is similar to an INI file, which is widely used in the Windows world and con-

sists of a heading in square brackets, followed by a number of keywords, an equal sign and a value. The last three items have to be placed in a single line.

The heading consists of the decoder type name (e.g. "[MX620]") and serves for documentation purposes as well as for decoder import. The other possible keywords used in the decoder definition files are:

<b>Keyword</b>	<b>Possible Value</b>
Manufacturer	NMRA-manufact.-ID 1-255
MaxAddress	99 / 114 / 127 / <u>10239</u>
Type	0 - 3 ( <u>1</u> ) <sup>1)</sup>
ProgMode	<u>0</u> - 2 <sup>2)</sup>
SpeedSteps	14 / <u>28</u> / 128
Direction <sup>3)</sup>	<u>Y</u> / N
AnalogMode	<u>Y</u> / N
SpeedTable	<u>Y</u> / N
ExtAddress <sup>4)</sup>	<u>Y</u> / N
ConsAddress <sup>5)</sup>	<u>Y</u> / N
DetectPulse <sup>6)</sup>	Y / <u>N</u>
ManBit <sup>6)</sup>	Y / <u>N</u>
Railcom	Y / <u>N</u>
Family	<u>0</u> - 2 <sup>7)</sup>
InternalSteps	1 - <u>255</u>
SpeedTabValues	<sup>8)</sup>
ProgMain <sup>9)</sup>	Y / <u>N</u>
FuncMap <sup>10)</sup>	Y / <u>N</u>
Functions <sup>11)</sup>	1 - 12 ( <u>6</u> )
FuncShift <sup>12)</sup>	<u>2</u> / 3
FuncCount <sup>13)</sup>	<u>4</u> / 5
MaxTabs <sup>14)</sup>	0-30 ( <u>0</u> )
MapCVA <sup>15)</sup>	<u>0</u> -255
MapCVB <sup>15)</sup>	<u>0</u> -255
MapValA_x <sup>16)</sup>	<u>0</u> -255
MapValB_x <sup>16)</sup>	<u>0</u> -255
CV_x <sup>17)</sup>	see below

**Remarks:**

- 1 = Loco decoder (mobile decoder), 2 = accessory decoder (stationary decoder), 3 = function decoder.

2. 0 = direct mode, 1 = page mode, 2 = register mode.
3. Decoder is capable of direction change using CV29.
4. Decoder is capable of extended addresses.
5. Decoder is capable of consist address.
6. Only relevant for decoders that use bit 3 and 6 of CV29 (currently these are only made by CT / Tran).
7. 0 = standard, 1 = old Lenz decoder with only 14 values in the speed table, 2 = reserved.
8. Values in internal speed steps, separated by commas (14 or 28 values).
9. Decoder is capable of programming on the main track.
10. Decoder is capable of extended function mapping.
11. Number of function mapping CVs (= number of lines in the function assignment matrix).
12. For how many functions (bits) will the 8 assignment fields be shifted to the left in the assignment matrix.
13. After how many CVs will the fields in the assignment matrix be shifted to the left (max. two times).
14. To limit the maximum amount of tabs for all tab types except "Sound", i.e. MaxTabs = 10 means that only up to 10 "Fct.", 10 "Man.", 10 "Etc." tabs will be shown. 0 means no limit.  
Reason: If there are e.g. too many "Fct." tabs, other tabs would not be shown at all.
15. Index-CVs which have to be set to access indexed CVs (MapCVA = first Index CV, MapCVB= second Index-CV, 0 when not used).
16. For each of the 16 possible mapping areas here the values are defined that have to be written into the index register(s) to access that map.  $x$  = mapping are (1-16), i.e. MapValA\_2 is the value that has to be written into the CV defined by "MapCVA" (see above) to access CVs in the second mapping. Note that the first mapping is assumed to refer to the "base address", i.e. the non-mapped area.
17. Here all CVs which the decoder is capable of are given, with the exception of CV 1, 7, 8, 17, 18, 19, 29 as well as 67-94, format is CV\_x, where  $x$  is the CV number. For indexed CVs the map number (1-16) is added after an additional "\_" character (e.g. CV\_264\_2)

The values for "CV\_x" entries are given in the format "description", "value range", default value, programming window register tab #, help text, "bit variable description". A default value of 256 describes a read-only CV, i.e. the value cannot be altered by the user. For the value range comma-separated values as well as from-to-specifications can be made (also mixed).

The register tab # defines, in which part of the programming window the variable will be shown, 2 means "Driving", 3 is "Functions", 4 is "Manuf. specific", 5 refers to "Others" (for "Driving" only one CV can be assigned, for the other register tabs up to 14 variables may be assigned) and 6 for "Sound", a value of 1 is not allowed. The bit variable description may be omitted and has the format "bit count, text, option 1, option 2, ...", which repeats for every bit group and is separated by bars ("|"). If no options are given, a numerical entry is expected. If also no text is given, the given number of bits is skipped. The bit groups have to be ordered by ascending bit count (bit 0 first etc.).

The special bit count "#" is meant for variables which are divided in (decimal) unit's place and decimal place, the first "#Only relevant for decoders that use bit 3 and 6 of CV29 (currently these are only made by CT / Tran). represents the unit's place, the second the decimal place. Bit variable descriptions that use the "#" symbol must not have other bit counts except this special one (which may appear once or twice). Additionally the special bit count "A" followed by a text prompt (e.g. "A,Long address:") allows the entry of a "long" decoder address (128-10239), which then is stored in two CVs (the current and the directly following one).

Please note that except for the CV\_x entries all other entries may be omitted, in which case the underlined default values will be used.

Long lines (especially for the CV\_x-entries) may be divided into several lines, if all lines except the last one are ended with a "-" (hyphen). The line break may occur only after commas and not within strings (delimited by quotes).



# Glossary

## **Accessory decoder**

Decoder for controlling of stationary equipment (accessories), such as turnouts, signals etc.; also referred to as turnout decoder or stationary decoder.

## **Arrow keys**

Special keys on the keyboard (engraved with ←, →, ↑ and ↓) to move the cursor within a data entry field (arrow left and right) or to the next or previous data field (arrow up or down).

## **Baudrate**

Measure for transmission speed. Must be set to identical values at both communication partners.

## **Binary**

Numerical system which is based on the numbers 0 and 1; one byte is represented by 8 binary digits (Bits), decimal 255 is represented as '1111111' in binary notation (note: some manufacturers call the first bit, i.e. the first binary digit from the right as bit 1 [e.g. Lenz], others as bit 0 [e.g. Zimo]).

## **Bit Variable**

Configuration variable, where each bit (or group of bits) has different meaning.

## **Button**

Framed field with grey background and textual or pictorial contents; clicking on it with the mouse triggers program function.

## **Configuration**

Adaption of the settings which modify the behaviour of decoders or of the software ADaPT; also called parameterization.

### **Configuration variable**

Also dubbed CV, refers to the (normally alterable) registers of a decoder, which contain information about the behaviour of the decoder, stored as numbers (value range 0 - 255 decimal); which meaning each CV has, is standardized by the NMRA, but not every decoder has to implement every possible CV (there are mandatory, optional and manufacturer specific CVs).

### **Control window**

Common term for engine throttle and switchboard window.

### **Decoder**

Receiver part of a DCC system; there are mobile (i.e. loco based) decoders as well as stationary (= accessory) decoders (for turnouts, signals etc.); sometimes also referred to as receiver.

### **Decoder address**

Each decoder must be given a unique address to be able to be accessed individually; the possible address range differs according to decoder type and digital command system between 1-99 and 1-10239.

### **Decoder description file**

Definition file which contains information about decoder attributes and configuration variables; is needed for the decoder specific layout of the programming window.

### **Default value**

Value that has been defined by the software or decoder manufacturer, which will be used when the product is freshly installed or instead of an invalid value set by the user.

### **Digital command system (a.k.a DCC system)**

Collection of the components of a digital command control system, here mostly used as reference to the command station (base unit) and the handhelds (controllers).

### **Engine database**

Collection of information about model railroad equipment; contains name, address, decoder manufacturer and type, all CV settings, engine image etc; normally stored as Microsoft Access<sup>TM</sup> compatible database in the file PFUSCH.MDB.

## **Engine throttle**

Window with predefined engine address, which can be controlled using mouse and / or keyboard (direction, speed, functions); multiple throttles may be open simultaneously.

## **Feedback (a.k.a Acknowledgment)**

Ability of a decoder, which allows its configuration variables to be read out on the programming track, i.e. its registers can be transmitted back to the digital command base station.

## **Firmware**

Operating program of a DCC system. Can be updated (if stored in flash memory), normally using a PC. ADaPT allows the transfer of new firmware into Zimo's MX1-2000 command station using proper firmware files.

## **Function mapping table**

Assignment, which function outputs of a decoder can be switched by which key on the handheld; will be stored in the decoder as CV 33 - 42 (if supported).

## **Hexadecimal**

Number system based on the numbers / characters '0' - 'F', i.e. 16 different digits; the largest value that can be stored into one byte (decimal 255) is 'FF' in hexadecimal notation.

## **Interface**

Also referred to as port; synonym for the connection of a DCC system to a computer; normally implemented as RS232 (=serial) connection.

## **Navigation bar**

Operational element to browse the database in forward or backward direction.

## **NMRA**

North American Model Railroad Association, parent organization of US-american model railroaders; defines the standards for NMRA-DCC compatible digital command control systems.

## **Port**

See Interface.

## **Programming**

The process of writing configuration variables into a decoder; there is a distinction between programming on the programming track and programming on the main track.

### **Programming track**

Piece of track that is separately connected to the DCC command station which allows the readout and programming of decoders; has to be isolated from the rest of the layout; only one engine / decoder is allowed to be on the programming track.

### **Programming window**

Dialog window which allows the visual control and the modification of decoder settings as well as the definition of decoder type and manufacturer.

### **Register tabs**

Separates part of a program window into several overlapping regions, which are marked by non-overlapping headings on the top; by clicking on these headings the corresponding region can be brought into foreground. Also referred to as "register cards".

### **Scroll bar**

Also called slider, a function element normally located at the right or bottom side of a window with arrow buttons at both ends and a movable button between them; serves as tool to shift the currently visible window contents.

### **Scroll keys**

Special keys on the keyboard (entitled with PG UP and PG DN) to scroll the currently visible window contents forward or backwards by one page.

### **Selection list**

Data entry fields for which a list of possible values can be displayed; by selecting entries from this list, the contents of the data entry field can be modified.

### **Serial number**

Every full version of ADaPT has a unique serial number assigned to it; it is either already printed on the program disk #1 (if the full version was pre-paid) or comes along with the registration information.

### **Shareware**

Software which is available free of charge (i.e. normally only expenses such as disk, s/h etc. have to be paid) and allows - in contrast to demo versions - profitable use.

### **Speed step**

Because of the digital nature of data communication, in digital command systems speed settings are transmitted in discrete steps to the decoder (0=stop, 14=max. speed with 14-step-systems); DCC standards allow 14, 28 or 128 speed steps, it is also possible to mix decoders with different speed step settings in one system.

### **Speed table**

Ability of a mobile decoder to map the current setting of the throttle to the real loco speed using a configurable table of 14 or 28 values.

### **Switchboard**

Program window with the ability to control up to four outputs of a stationary decoder using mouse and / or keyboard; multiple switchboards may be open simultaneously.

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