Electronic Solutions Ulm

User Manual

LokProgrammer

Software Version 1.4x

September 2002

Not suitable for children under 3 years of age. Inappropriate use may result in injury due to sharp points and edges.

1. Properties of LokProgrammer

Thank you for purchasing LokProgrammer. LokProgrammer is an accessory for the use with all decoders made by ESU electronic solutions ulm GmbH.

LokProgrammer consists of two core components: An interface module - which represents the physical connection between PC and the locomotive - and software, which can be run on any PC using MS Windows.

This combination allows you to manipulate and adjust the many features and properties of LokSound decoders easily by using your PC. Never was it easier to program a digital decoder than with LokProgrammer. Thanks to the graphic interface of Windows it is possible to achieve the optimal adaptation of LokSound decoders even if you have none or very little experience in programming digital decoders.

LokProgrammer also allows you to modify all sound fragments and sound effects stored on the decoder as often as you desire. This opens a totally new range of possibilities: You can now compile your own sound which matches exactly your idea of the particular model locomotive!

This manual describes in detail how to modify sounds and which methods to use to achieve certain results.

Please follow the installation guidelines to assure that your LokProgrammer software operates to your full satisfaction!

If you adhere to this manual you will be rewarded by long life and trouble-free operation of your Programmer.

ESU electronic solutions ulm GmbH, May 2002

2. System Requirements

In order to use this software you need a commercially available PC with the following minimum requirements:

- Intel ® Pentium Processor, 100MHz or faster
- Microsoft Windows 95, 98, 2000 or XP (not Windows NT)
- CD-ROM drive (2x or faster)
- One serial interface (not used for anything else)
- Soundblaster® or 100% compatible card with Windows Driver
- Microsoft DirectX 5.0 or higher

There's not much to say regarding the processor and the operating system. Any PC which runs Windows 95 satisfactorily can be used.

To connect LokProgrammer to the PC a serial port is required. Normally every PC has two (COM1 and COM2), one of which may be used for the mouse. In order to modify any sound functions with this software an Audio Card must be installed. All cards with a functioning Windows Driver are suitable.

In addition Microsoft API DirectX Version 5.0 or higher must be installed on your PC. This is part of the standard configuration in Windows 98, 2000 or XP and also with certain versions of Windows 95. If you are in doubt simply install DirectX API new. How to do this is explained in Appendix 6.1 "Installation of DirectX API".

3. Connecting the LokProgrammer

The LokProgrammer has to be connected as shown in Figure 1: Use the serial cable provided to connect the LokProgrammer to any available COM port. LokProgrammer supports COM1 to COM4.

To supply power to the LokProgrammer, you have two possibilities:

- You may use the AC/DC adapter shipped with the LokProgrammer. However, this AC adapter will work with 240V AC mains only. The plug connection is shown in figure 2.
- Use the 16 V AC output of any model railroad transformer and connect it to the 2 pin terminal block.This is recommended if you need more output power than 500mA to manipulate big gauge locomotives.

Once power has been switched on, the green LED should light up.

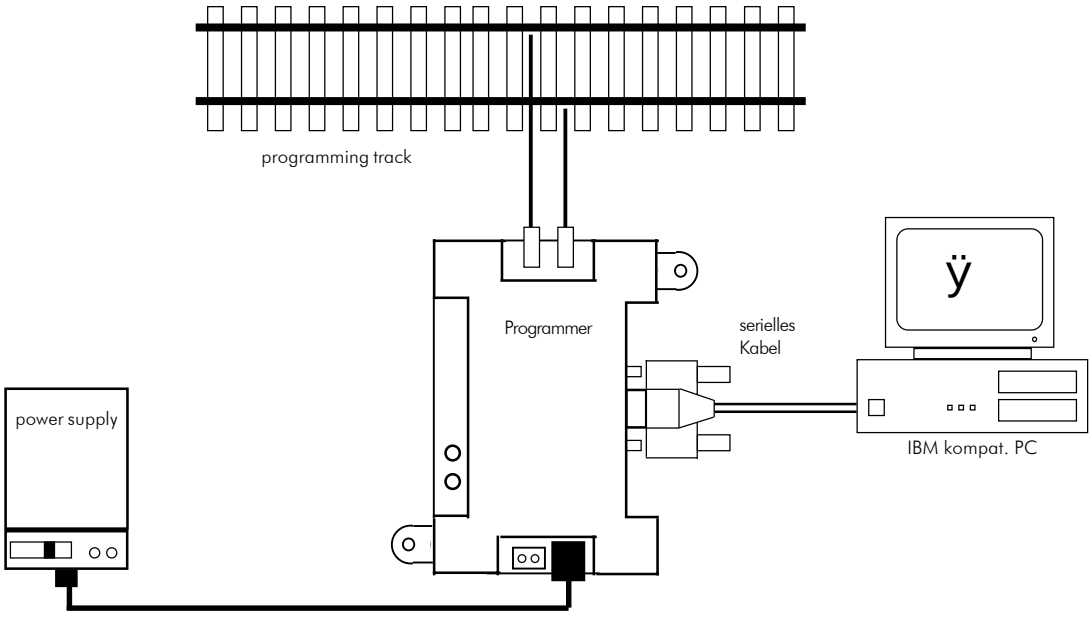

figure 1:Wiring Diagram

figure 2: Connection schematic of plug

The terminals Track 1 and Track 2 are to be connected with the programming track.

Please make sure, that the programming track is completely isolated from any other part of your layout!

The two LEDs on the LokProgrammer indicate the following:

Green LED: Is lit continuously when supply voltage is available. Is blinking when the LokProgrammer receives data from the PC.

Yellow LED: Blinks quickly when voltage is applied to the programming track and data transfer takes place. Blinks slowly, if there is too high a current on the programming track and the current guard has disconnected the programming track.

4. Installing and Starting the Software

Make sure that the LokProgrammer is connected as described above and is ready for use.

The Software consists only of the file LokProgrammer.exe.

Insert the CD-ROM into the CD-ROM drive. After a few seconds the program should start automatically.

Should the auto start function in Windows be turned off or should the programm not start for any other reason proceed as follows:

Click on the START button in the task bar of Windows 95 and select RUN. Then type X:\LokProgrammer.exe and click OK. Replace X with the name of your CD-ROM drive (usually D:).

After a short wait the programm should start and you should see the main menu on your monitor. During starting one of two possible error messages may appear which both indicate the same problem:

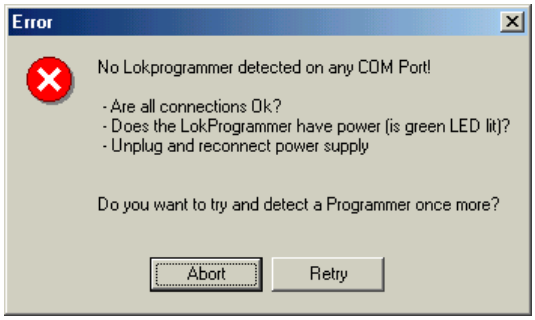

Figure 3: Error Message

If you see this window then the LokProgrammer is either not at all or not correctly connected. Please also make sure that the power supply is operating (green LED is lit) and that the LokProgrammer has been connected correctly to the PC.

The other possible error is related to the Audio Card in your PC. If there is no audio card in your PC you may ignore this error message (see figure 4) and continue, however, all functions regarding programming of sounds are deactivated. If you are sure there is an audio card installed in your PC and it is operating properly then there are still two more possible causes for this error:

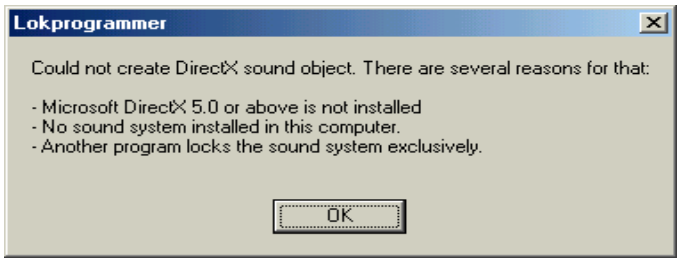

Figure 4: Error Message

Either you have currently switched on another programm, which requires the Audio Card (i.e. audio editors like cool edit) or the essential DirectX API is not installed. If you suspect this may be the case or you are uncertain, reinstall DirectX API again. You can find hints on how to do this in Appendix 6.1 "Installation of DirectX API".

5. Programm Functions

The software fulfills several tasks

- Setting / Modification of all parameters of the digital part of the LokSound decoder. All options can be easily adjusted using the PC. You don't have to struggle and set CVs using your command station or hand held controller. LokProgrammer does it all for you.
- Modification of sound data which are stored on the LokSound module; it is possible to modify or replace any sound fragments which are stored on the LokSound module at any time! Thus you can compile your own sound effects. You can use any sound data which you can save on your PC; locomotive sounds, music, language, etc or anything else you can possibly imagine!
- Testing of new LokSound decoders

According to the various tasks of the programm the software is split into different menus.

5.1 Assistant

When starting up the programm a small window appears on the monitor, which allows you to activate the most important functions. Depending on your selection the appropriate function will immediately appear. Please note, that it can also activate any function directly from the menu or by using the appropriate symbol in the toolbar.

You can either download complete sound projects directly from the CD-ROM or you can first read out the data from a locomotive decoder and subsequently read out individual data easily and comfortably.

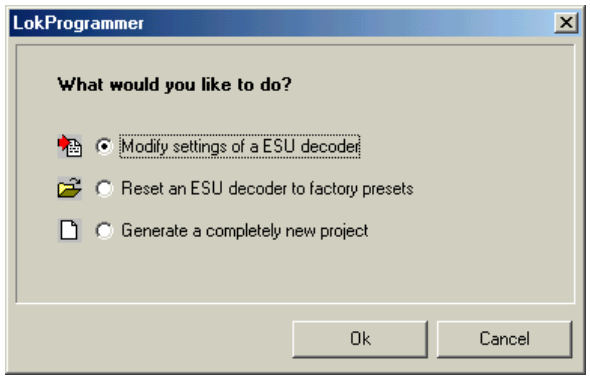

Figure 5: Assistant dialog

5.2 Supported decoders

With version 1.4x of the LokProgrammer you can modify data of LokSound, LokSound2, LokSoundXL, LokPilot and LokpilotDCC decoders. However, these different types of decoders offer different features and therefore the software needs to be told which decoder type you are currently working with. Depending on the decoder type not all options and features may be available. Please always refer to the user manual of the particular decoder you are using. In paragraph 6.1 (Supported CVs) you'll find many hints regarding all functions supported by the respective decoder.

The LokProgrammer Software will always support the whole range of decoders produced by ESU. Therefore, after the release of a new decoder, a software upgrade for your LokProgrammer will be needed. The latest software is available for download on our webpage free of charge.

5.3 Decoder Settings

The register Decoder Data contains all settings relating to the digital part of the LokSound decoder. Please note, that this information cannot be viewed on the monitor when starting the software. First you have to start a new "Project" or open an existing file from the hard disk. Projects are representations of all data stored on the decoder. It is also possible to first read out the current settings of the decoder.

5.3.1Read Data from Decoder

Before modifying or adjusting any data on the decoder it is recommended to read out the current settings from the module.

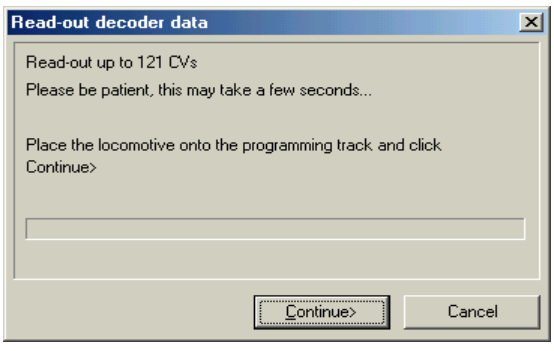

Figure 6: Read Decoder Data dialog

Put the locomotive onto the programming track and make sure that the programming track is connected correctly.

Then click on the button „Read CVs of Decoder" located on the toolbar at the top of the screen. Alternatively you can use the command „Read Decoder Data" from the menu: Programmer. A small window as per figure 6 will appear. Once you have clicked on „Next>", the programm will start reading out the data from the decoder. Please be patient, this may take a few minutes. The current status of the read out is indicated in the progress bar.

If the data cannot be read out an error message will be displayed. This message can be triggered by several causes:

- The locomotive does not sit properly on the programming track or the track is not connected correctly to the LokProgrammer
- The LokSound decoder is not correctly wired, particularly the connections to the motor of the locomotive may not be correct.
- Perhaps the decoder may have a defect.

Please check if any of the above points is the cause of the malfunction and try to test the decoder as described in Chapter 5.5. If the decoder works as desired but you cannot read out the data please contact our technical support.

5.3.1 Setting the Address

In the window Address you can set and adjust any parameters relating to the address of the LokSound decoder: you can select either long addresses (4 digits) or the short address format. Please note, that these settings are valid for operation with NMRA-DCC compatible command station. When operating the Decoder with the Marklin / Motorola Protocol use the Marklin address which may be set separately.

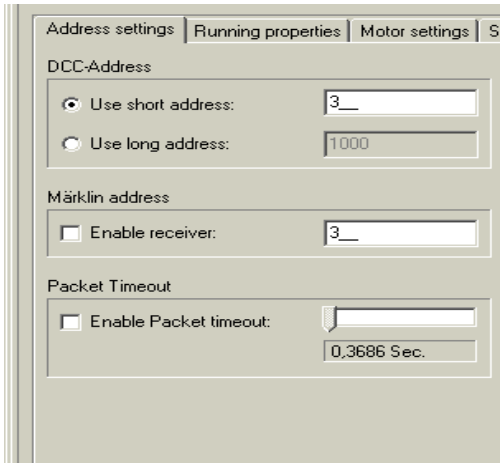

Figure 7: setting the address

The Consist Address is used for multiple headers in DCC mode.

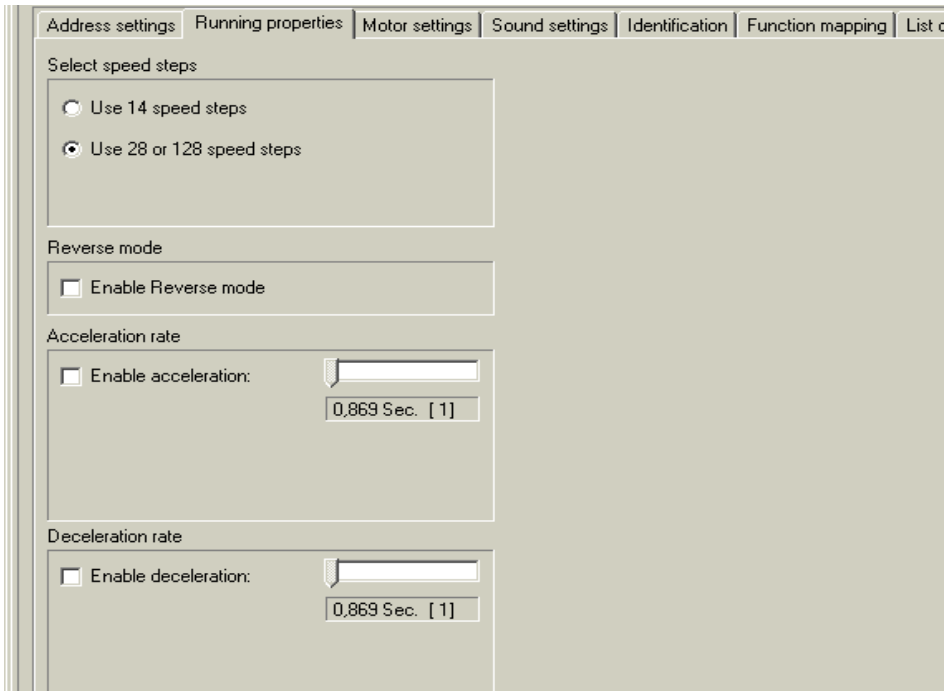

Figure 8: running properties

5.3.2 Running Properties

Here you can adjust all settings for running the locomotive. In DCC mode you first have to select either 14 or 28 speed steps. Please note this setting has to match the setting at your command station.

If you activate reverse mode then the direction of travel will be reversed: the directional headlights will also change over.

If desired you can select a time in seconds for acceleration / deceleration which the locomotive will require to reach maximum speed from stand still and vise versa.

The field Speed Table allows you to choose between a 3-point characteristic and the Speed Table.

Depending on your selection you can then set the appropriate points in the field below to achieve prototypical running.

Both the 3-point characteristic as well as the Speed Table function with 14 or 28 speed steps in all operating modes; whether you run the locomotive in DCC mode with 14, 28 or 128 speed steps or use the Motorola format (14 speed steps) the selected characteristic will always be adapted to the running mode currently selected.

5.3.3 Motor Settings

You can select two settings for the tact frequency for motor control; particularly older universal motors (AC motors) may not run very well when using the recommended 22,100Hz setting, they possibly may not start or not generate the torque required. In such cases we recommend to use the 87Hz setting.

You can also select to activate load control (back EMF). If so desired you can select an automatic reference voltage or set a specific reference voltage manually. Please refer to the user manual of your LokSound decoder for more information on the motor control parameters.

The number of settings -respectively the settings themselves - depend on the type of decoder i.e. LokSound or LokSoundXL. To select useful values refer to the respective user manual.

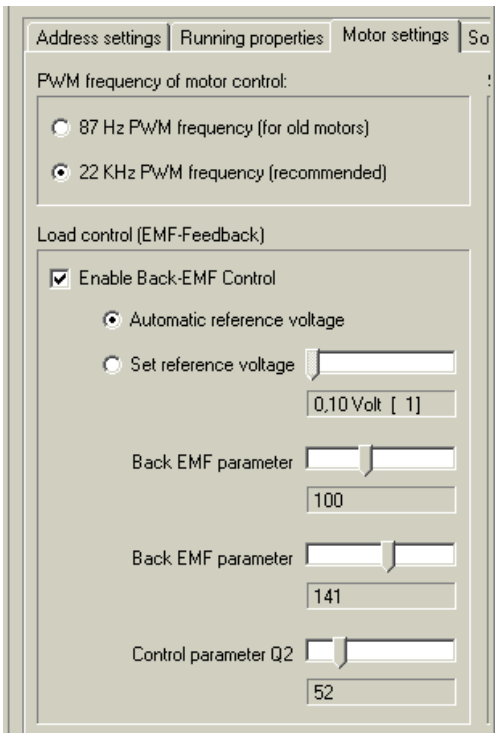

Figure 9: running properties

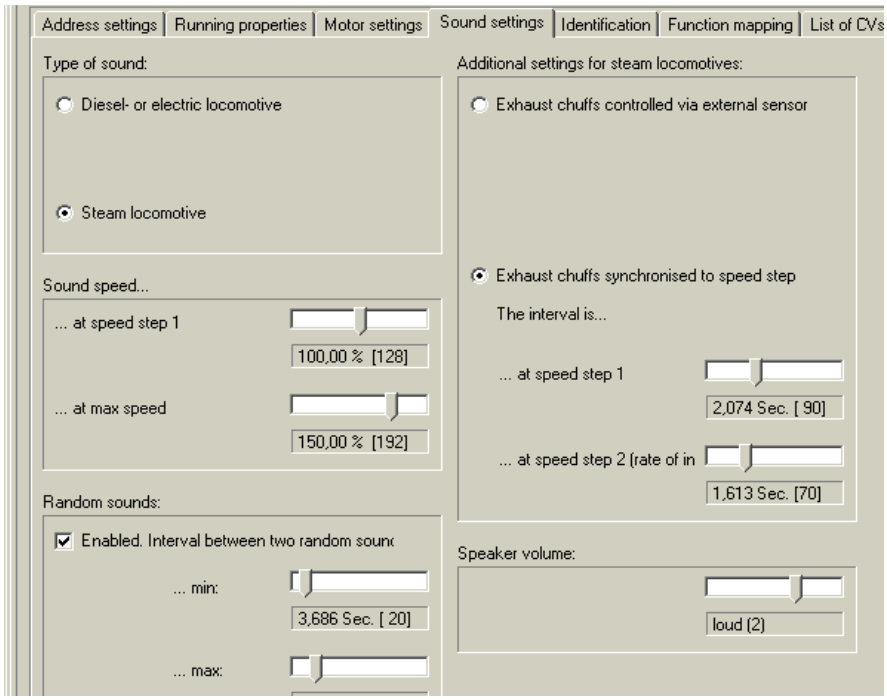

Figure 10: Sound Settings

5.3.4 Adjusting Sound Data

Here you can adjust any parameters, which are related to the sound reproduction of the LokSound decoder.

To better understand the concept used for sound storage and reproduction used in LokSound decoders it is important to bear in mind the following:

The type of sound (steam, diesel, etc) stored in the decoder is determined by means of the tab „Compile Sound Effects". There are several methods to modify sound fragments already stored on the decoder (refer to Chapter 5.6). Here you can programm how the sound fragments stored on the LokSound module can be influenced. These settings have to correspond with the type of sound. You will not have any success if you for instance store sound fragments of a steam locomotive on the LokSound decoder while you have set the sound effects for a diesel locomotive.

First you have to select the type of locomotive i.e. steam or diesel / electric. If you choose a steam locomotive you can now set further parameters to synchronize the exhaust chuffs with the revs of the drivers; either by connecting an external wheel or axel sensor to the decoder or by synchronizing to the speed step. If you choose the latter method you can now adjust the time between two chuffs first for the lowest speed step or for speed step two (this corresponds with the rate of acceleration). To determine suitable values please refer to the user manual of the LokSound decoder. When using a LokSoundXL decoder the interpretation of these values may vary; please refer to the user manual.

The field "Speed of Engine Noise" indicates the revs of the diesel engine at the lowest speed step (MIN) and the maximum speed step. The value is given in percent, whereas 100% represents the speed of sound reproduction is the same as when the sound fragments were recorded originally. 200% means sound reproduction at twice the recording speed.

In the field „Random Sounds" you can set the time interval for playing various sound effects like escaping steam (pop valve), shovelling coal, air pumps, water pumps, etc. The sound volume can be adapted to the speaker by means of the slide control.

Please refer to the appropriate remarks in the user manual of your LokSound decoder.

5.3.5 Functions in Analogue Mode

In this window you can activate functions of the ESU decoder in analogue mode. Load control is not available in analogue mode but you can adjust the starting voltage with the slide control.

You may also select which functions should be active in analogue mode. Thus you can also enjoy the sound effects in analogue mode. Please note that not all ESU decoders support these functions.

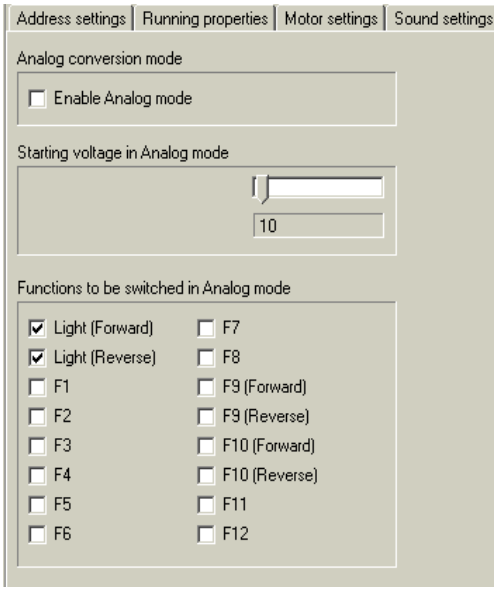

Figure 11: Functions in Analogue Mode

5.3.6 Function Outputs

This is the most complex part of the software; there you can assign each function key to any of the 8 functions F1 to F8 (LokSound) respectively F1 to F12 (LokSound2 and LokSoundXL). Please remember that the Märklin system only has 4 function keys F1 to F4 even in the latest version of the new Motorola – format. The command station 6021 will only transmit this format after setting various switches. Please refer to the specific instructions in the user manual of the LokSound decoder.

Figure 11 gives you an overview of all the possible settings.

In order to assign a function to a certain function key all you have to do is tick the appropriate square where the column of the function key intersects with the row of the function. Please note, not all function keys can activate all functions. Grey squares indicate combinations which are not permitted.

Please bear in mind that function mapping is stored in CVs. You should always read out the decoder data first - and thus find out the current settings - before you make any changes.

It is possible to assign several functions to one function key. You could for instance trigger a random sound every time when function output AUX is switched on. It doesn't make much sense, however, to activate two or more sound effects with one function key.

We want to point out the feature which allows you to switch acceleration and deceleration on and off by means of a function key. This is particularly useful when shunting to assure that the locomotive responds to any driving commands immediately.

It is also possible to assign various blinking effects to the function outputs and to adjust the brightness in 32 steps (LokSound) respectively 15 steps (LokSoundXL). This is achieved by electronic control; i.e. the lamps will be switched on and off very rapidly.

The actual duration of brightness as well as the on/off period may be adjusted for all outputs together by means of the slide control.

Depending on the type of Decoder some options may not be available respectively not all theoretical possible combinations may be achieved. Combinations which are not permitted are indicated by the grey squares.

Please note it does not make sense to assign a function or sound effect to several function keys since the decoder can not know which function key has priority.

Please remember, that when using the LokSoundXL decoder each function output has to be switched on by placing a tick in the field "active" before this function output may be used.

5.3.7 Identification

Here you may retrieve the manufacturer's ID of the decoder as well as the version of the Decoder-Firmware. It is also possible to store additional information into freely useable fields.

5.3.8 Writing Decoder Data

So far all adjustments have been done on the PC only. No data has actually been transferred to the decoder. Now you have to transfer or write the data into the decoder. Please do not forget to implement the individual steps as outlined below because all settings,

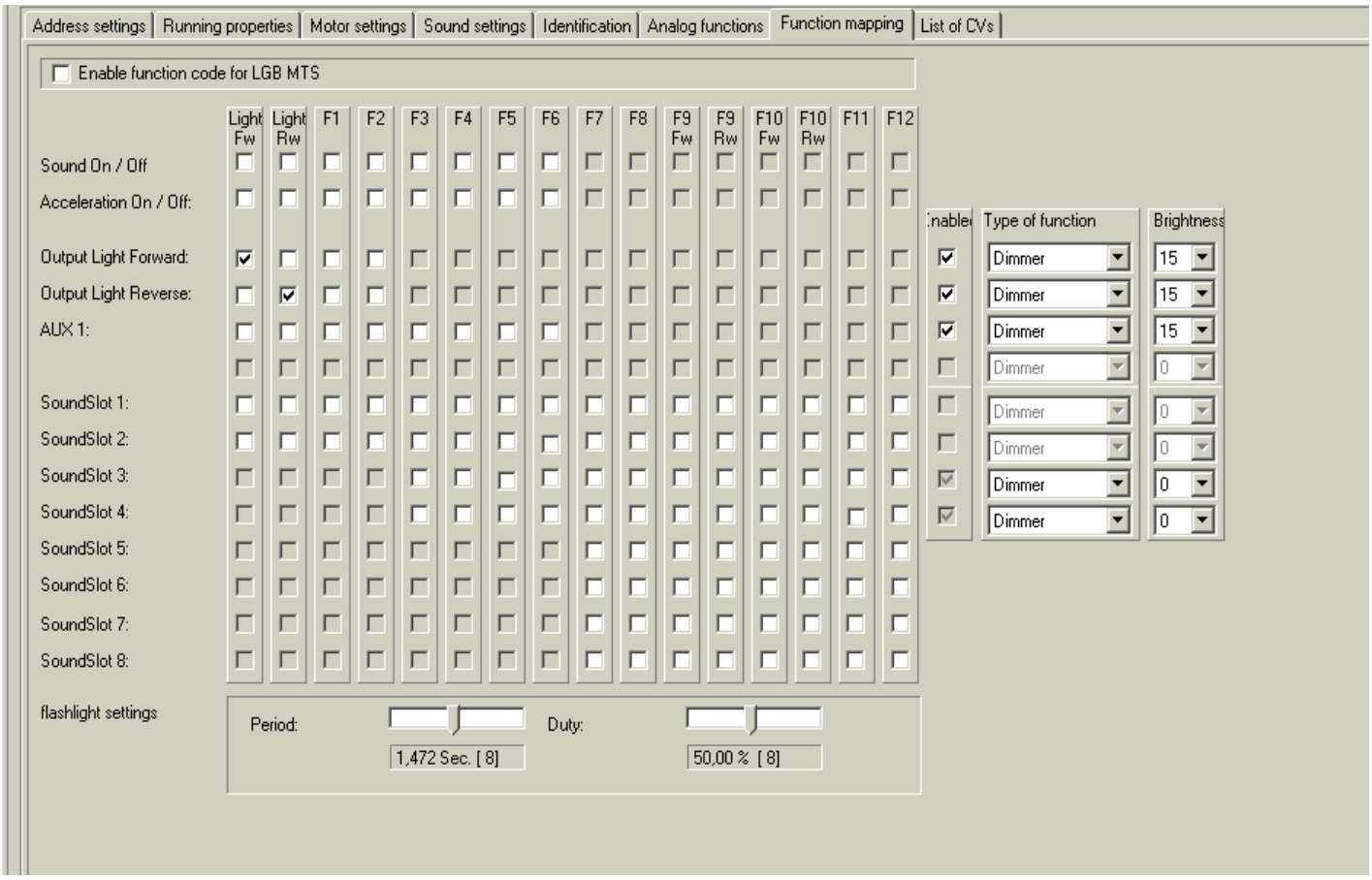

Figure 12: Overview of all possible Function Output settings

which are modified by you with the software are lost when you exit the programm, unless you have stored them in the decoder.

Click on „Write CVs of Decoder“ in the toolbar at the top of your monitor or select „Writing Decoder Data“from the main menu. Click „Continue“ and all previous settings of the LokSound decoder will be replaced by the new ones.

5.3.9 Saving Decoder Data to Hard Disk

All settings can be stored on the hard disk of your PC. Thus you can compile an archive of all the settings for each individual locomotive. The CV settings will be stored together with the sound data. Please also refer to Chapter 5.6.3.

5.4 Read / Write CVs

Here you can read out and write individual CVs of the decoder.

Enter the number of the CV which should be read or written in the top field. If you want to read the value click the button READ CV. The value will be displayed as a binary and as a decimal number.

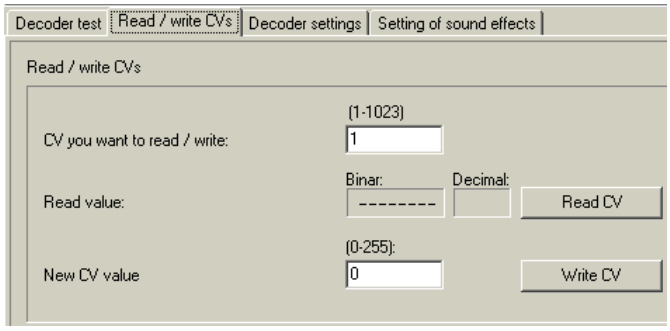

Figure 13: Reads / writes CVs

The binary number shows if the value could actually be read. The display must always show a combination of Zeros and Ones. Should there be some Plus or Minus symbols then the read out was not successful. Try it once more and check if the locomotive has sufficient contact to the programming track.

If you want to write a CV, enter the number in the top field and the new value in the field at the bottom. Click the button WRITE CV and the new value will be recorded.

5.5 Decoder Test

Here you can do a functionality test of your decoder. You can simulate all function keys and even run commands. Thus you can actually run locomotives on the programming track using your LokProgrammer.

However, the LokProgrammer limits the current to approx 800mA. Should the motor draw a higher current the overload protection will be activated and the track will be disconnected. This will be indicated by the blinking yellow LED on the LokProgrammer. In this case remove the locomotive from the track and restart the programm.

All other functions are straightforward; you can select the locomotive address from a drop down list and also set the appropriate number of speed steps. Please note that the number of speed steps has to be same as the corresponding setting of the decoder.

Now you can control the speed by means of the slide control. The current speed step is also displayed.

Please note, that this feature does not replace a command station. The power supply of the LokProgrammer will never allow you to run more than one locomotive at a time. This feature is intended for initial tests of a newly digitalized locomotive.

5.6 Compile Sound Files

LokSound decoder offers - as the first and only product in its class - the option to replace stored sound fragments with other, totally new combinations of sounds. Thus LokSound decoder is a platform for all imaginable sound sequences, which may occur in the railway environment. This universal and extremely flexible concept allows not only storing sound (i.e. noise) but also music or spoken words, which may be stored and replayed as required! Let your imagination run wild.

First we want to introduce the general concept of the LokSound decoder, which allows you to appreciate the manifold variations and to optimally utilize all features. Then we will describe the specific sequence step by step. Please read this introduction before you start compiling new sound projects. Without understanding the concept you may not recognize and utilize the potential of the software.

5.6.1 Concept of Sound Updates

The LokSound decoder contains a Flash Memory in which all sound data are stored in digital form. Individual sound fragments may be stored separately.

All data is transferred from the PC with the aid of the LokProgrammer to the Flash Memory.

LokSound decoder contains a sequence for playing various sounds. This sequence determines which sounds are played at any specific point in time and also what sound effect should be triggered by pressing a function key, or if and how often and for how long sounds like coal shoveling, steam release (pop valve) or the air pump should be played while the locomotive is stationary. While the sequence as such is already contained in the software you have to enter the desired sound fragments in the various positions.

5.6.1.1 Sound Memory

The Flash Memory has a capacity of 1Mbit. This is sufficient to store approximately 11.8 seconds worth of sound fragments in it. You may ask how this is possible, since you would obviously hear the noise of the diesel engine continuously and not just for a couple of seconds after starting the engine… This can be achieved simply by storing only a short fragment of the engine noise in the Flash Memory (about one half of a second). This fragment is then replayed in loop mode which creates the impression of continuous sound. Such tricks help to optimally utilize the available memory.

You may store as many sound fragments as you like within the Flash Memory. Every fragment will be recorded in a list containing information on the exact location and length within the memory. These sound fragments are also numbered so they can be found and assigned later on.

5.6.1.2 Sound Sequence

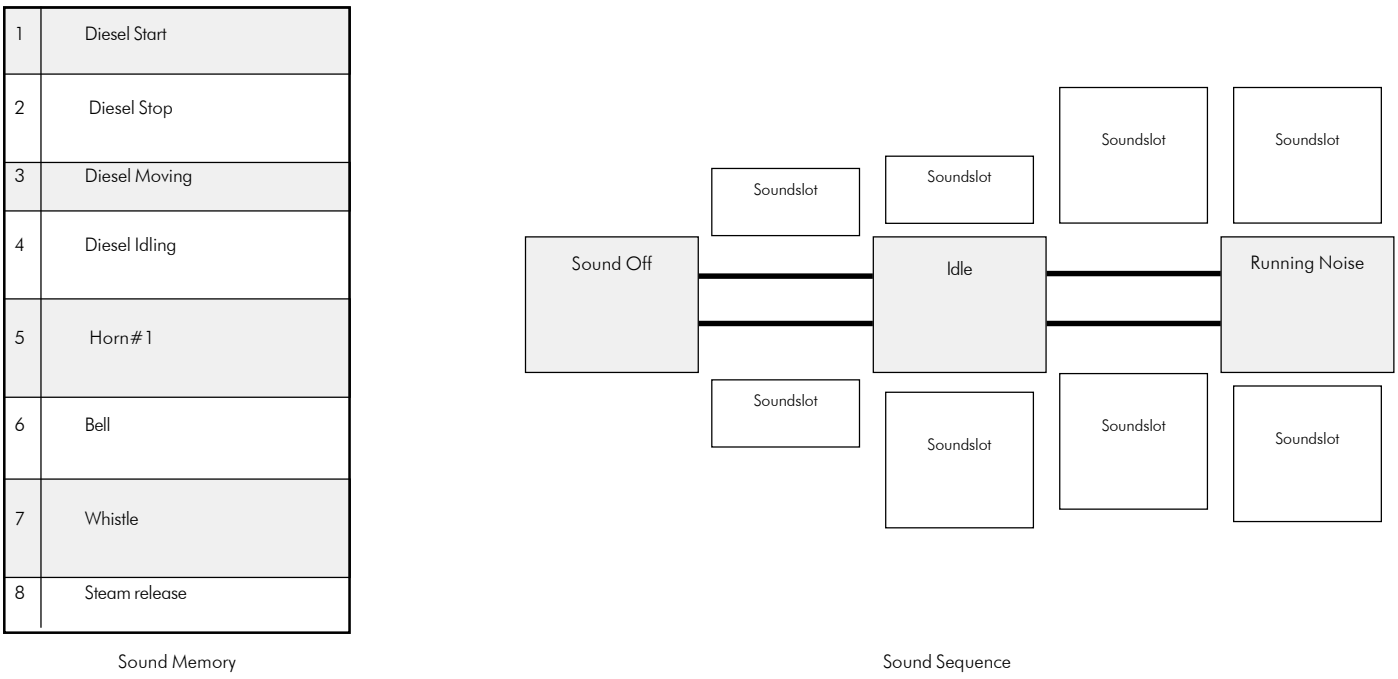

Figure 14: Sound Memory and Sound Sequence

After you have stored various sound fragments in the flash memory you have to determine when a certain sound should be played and for how long.

All necessary information is contained in the sequence plan. This consists mainly of a table which is structured as follows:

The sequence plan is based on three basic states of operation which are shown in the center of the graph:

- At "Sound Off" the locomotive is stationary and the sound module is turned off.
- In "Idle" the locomotive is still stationary but the sound module has been turned on. A diesel engine would have been started at this point and would idle.
- At "Running Noise" the locomotive is moving and the appropriate sounds would be heard.

The arrows between the three basic positions represent the change of activity which maybe reproduced. It is possible to assign sound fragments to each of the three basic states (positions) as well as to the changes from one to the other. For this purpose a number of sound slots have been assigned to the various positions respectively for the change from one to the other. You can now enter a number of sound fragments into these sound slots. These entries represent one sound fragment each which is stored in the Flash Memory. Whenever the LokSound module changes from one basic state to another then the sound fragments entered into the appropriate sound slots will be replayed. Do you want to prevent generating any sound at a certain position or change of position you simply do not enter a sound fragment in the appropriate sound slot.

The various sound slots have a different purpose / effect depending on where they are located.

Sound slot 1 is allocated to the change from „Sound Off" to „Idle"and has sufficient space for four sound fragments. Here you would enter the sound fragments which should be played when the sound module is switched on. For instance for a diesel engine you would store the starting noise of the diesel. The two possible entries which will be played one after the other allow a two part starting noise; first the noise from the compressor then the actual start of the engine.

Sound slot 2 is directly assigned to „Idle"; again two entries are permitted, hence they should contain the noise of an idling diesel engine. It is important to be aware that all sound fragments entered into sound slot 2 will be played in sequence and in loop mode. This assures that the noise of the diesel can be heard as a continuous sound even so the actual sound fragment is only parts of a second long. When simulating a steam engine you would normally only enter a very soft hissing noise which represents the continuous loss of steam of a typical steam engine.

Sound slot 3 between idling and running sound allows four entries. The sound fragments entered here will be played during the acceleration phase of the locomotive. In this context acceleration means that the actual speed of the locomotive is lower than the desired speed. Example: the acceleration time of the locomotive has been set to ten seconds. The locomotive runs slowly you turn the controller to maximum speed. The locomotive will now – according to the preset time – accelerate slowly. During this phase only the sounds in sound slot 3 will be played. This allows variations of the sound and store particularly strong exhaust chuffs or a noisier diesel sound during acceleration. The same rule applies as before, namely that if you have entered several sound fragments they will be played one after the other (1, 2, 3, 4) and then again and again in loop mode (1, 2, 3, 4, 1, 2, 3, 4, ...).

When simulating a steam engine you may store up to four chuffs to represent 2 – 3 – or 4-cylinder locomotives. The exhaust chuffs will be played in sequence. The time interval between the chuffs can either be synchronized to the speed step or can be controlled by means of an external sensor attached to the locomotive axis. Please refer to chapter 5.3.5 for the appropriate settings.

In sound slot 3A you can enter one sound fragment, which will be played just once during the transition from idle into running mode. Here you could enter for instance the locomotive whistle or horn, which will be replayed every time the locomotive starts moving.

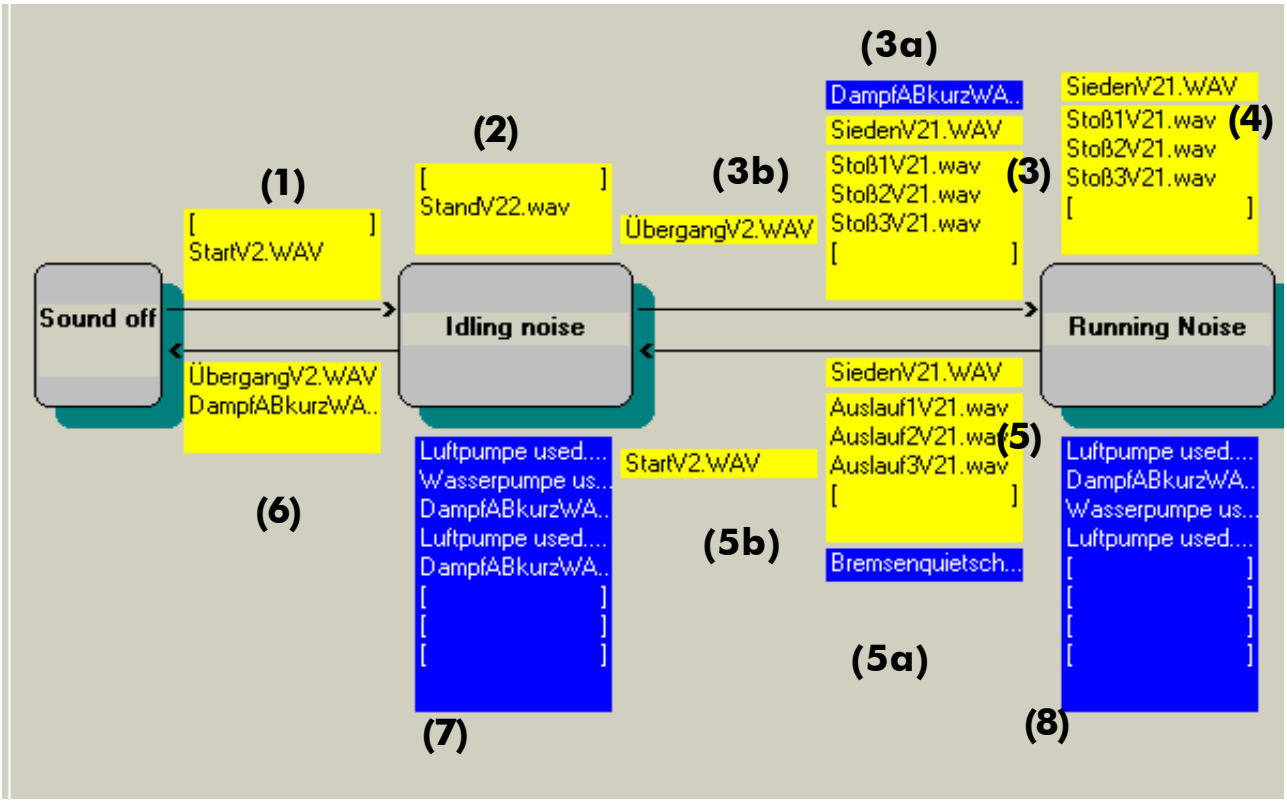

Figure 15: Sequence plan

Above sound slot 3 (refer to figure 14) is another single entry sound slot. Here you can enter a sound fragment representing a pause (or silence), which will be played whenever the chuffs entered in sound slot 3 are shorter than the actual time interval between two exhaust chuffs.

In sound slot 3B you can enter one sound fragment, which will be played just once during the transition from idle into running mode, but this time in channel one. This is important to simulate e.g. the rapidly increasing revs of a diesel engine for diesel-electric locomotives.

Sound slot 4 contains four possible entries for running. As in sound slot 3 you can simulate a steam locomotive with up to four different exhaust chuffs, which are played back in sequence. The sound fragments in sound slot 4 will be played whenever the locomotive is traveling at the "normal speed". To simulate a diesel engine you should enter the Running Diesel sound fragment in sound slot 4.

Again there is an additional one-entry sound slot to be used for the silence fragment. This sound slot is only used when simulating a steam locomotive (as in sound slot 3).

Sound slot 5 contains the sound fragments to be played between running noise and idle i.e. while coasting or breaking. As in the corresponding function in sound slot 3 the determining factor is the programmed deceleration (momentum).

When simulating a steam engine you should enter 2 (respectively 3 or 4) chuffs which represent a very soft exhaust (coasting and breaking steam engines simply don't generate spectacular sound effects). When simulating a diesel engine you would enter a very soft diesel noise in sound slot 5.

Sound slot 5A will contain one sound fragment, which will be played just once during the transition from running into idling. Here you could enter a screeching noise of the breaks just before the engine stops.

Above sound slot 5 you find again a one-entry sound slot to be used for the silence fragment between exhaust chuffs.

In sound slot 5B you can enter a sound fragment, which is played just once during the transition from Running into Idle in channel one. Here you would enter the sound fragment of a diesel-electric drive decelerating rapidly to idling.

If you do not want to utilize the features for having different sound effects during acceleration and deceleration (perhaps because you do not having any appropriate recordings) you simply enter the same sound fragments as for sound slots 3, 5 and 4. You must enter sound fragments in sound slot 4 otherwise no sound will be played.

Finally in sound slot 6 you enter all sound fragments, which should be played during the transition from idle to sound off. To simulate a diesel engine you would enter the sound of the stopping engine and in addition perhaps the release of some compressed air.

Sound slot 7 and 8 are assigned to idling and running and offer the possibility to enter 8 individual sound fragments. These sound slots may contain any random sounds you want to play either while the locomotive is stationary or running at normal speed. This could be the sound of shoveling coal, release of steam, air- or water pump, etc. It works like this: the Sound decoder randomly selects within a predetermined time interval one of the eight possible sound fragments and replays it. Which sound will be played when is controlled by the LokSound decoder and cannot be pre-determined. This results in ever new sequences of the various random sounds. The time limits of the intervals for random sounds can be preset in two CVs as described in Chapter 5.3.5.

5.6.1.3 Sound Effects Activated by Function Keys

In addition to random sounds played depending on the state of movements you may trigger these sound effects by pressing the function keys on your command station or handheld controller. There are 6 or even up to 8 sound slots available as shown in figure 15.

You can enter 3 sound fragments in each sound slot which in turn may be assigned to almost any function key. You can also select if the sound should be played when you push the assigned function key or if the sound should be played until you push the appropriate function key once again.

The following is a detailed description of how these various options can be programmed by using the LokProgrammer software.

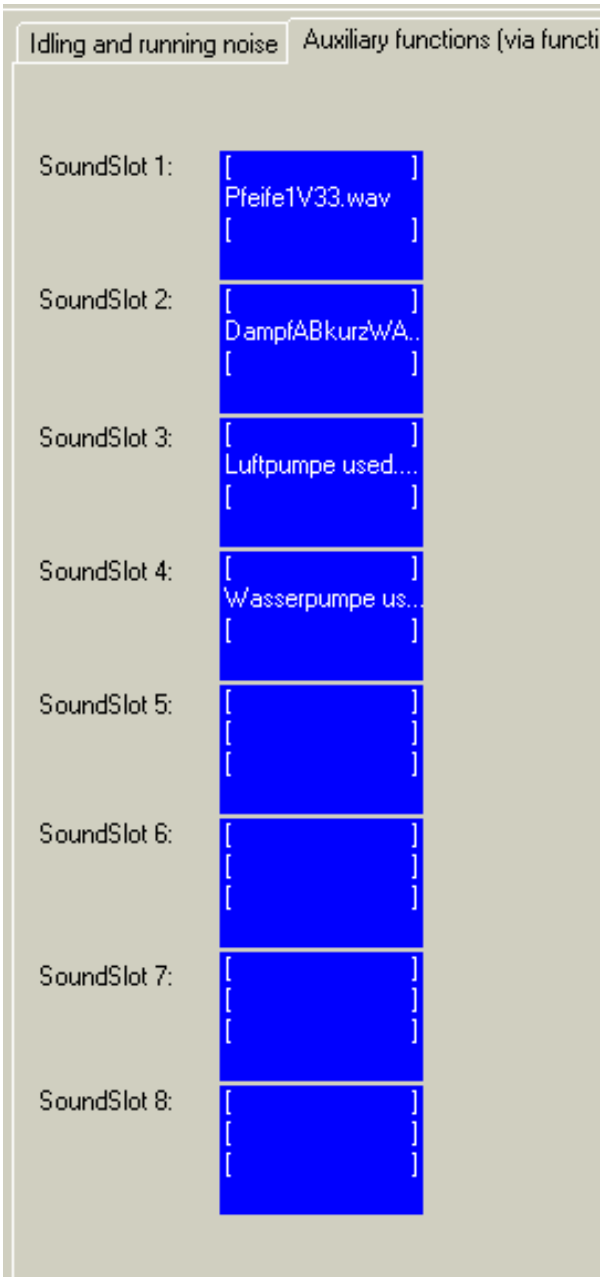

Figure 16: Sound effects activated by Function Keys

5.6.2 Sound Projects

All sound data as well as the sequence plan containing all sound slots and sounds to be activated by the function keys can be transferred from the PC to the LokSound module. However, the reverse is not possible. That means, that all data will be stored in the LokSound decoder according to the settings you have entered and stored previously but you cannot read out the sound information. There is a simple reason for this. Reading of a data bite takes at least 8 times longer than writing a bite. The read out of the data would take approximately 2 hours – we feel this is just simply too long…

We have elected another method, which is at least as practical as reading the data from the LokSound Decoder; you first save all the data on the hard disk of your PC. In practice this means that all data of the Flash Memory the sequence plan as well as the various sound slots will be saved to the hard disk before you transfer the data to the LokSound module. Thus you have an exact copy of all the data on the hard disk which you can open at any time and modify as desired. All you have to do is remember which data file on the hard disk contains the data for which decoder respectively engine – assuming you have more than one sound decoder…

The data files which you store on the hard disk are so called project data files. We call the process to compile a new set of data for a specific engine a Project. Now you will learn how you can open already completed projects, how to modify them and save them again and also how to select specific sound fragments or sound files and include them in your own personal projects.

In addition to all sound data files you can also save all CV settings in software versions higher than 0.99 i.e. address, acceleration, etc in your project file. Thus you can create a specific file of all the settings for a specific locomotive and save it to your hard disk.

5.6.2 Loading / Saving Complete Projects

In order to load or open a new project click onto OPEN in the file menu and select the desired file. Should you only be at the beginning of your "experiments" with LokProgrammer we recommend to use one of the data files provided on the CD ROM which is supplied with LokProgrammer. This contains a number of different steam and diesel engine sound projects which are an excellent starting point.

When reading project data files a message may appear that this file contains CV data. If you click on YES this file will also be opened. These settings correspond to the factory preset values for the selected sound projects. Should you ever lose control over your programming efforts while experimenting with various settings for your LokSound decoder and you want to start from scratch, you can do this very easily; first open the sound data file which you want to restore. Click YES as response to the request if factory presets should be restored and load sound data as shown in chapter 4.6.6.7. Finally write the CVs into the decoder as outlined in chapter 5.3.9.

If you want to save changes you have made in the sound project simply click SAVE or SAVE AS in the file menu depending on whether you want to override an existing project or if you want to create a new project under a new name.

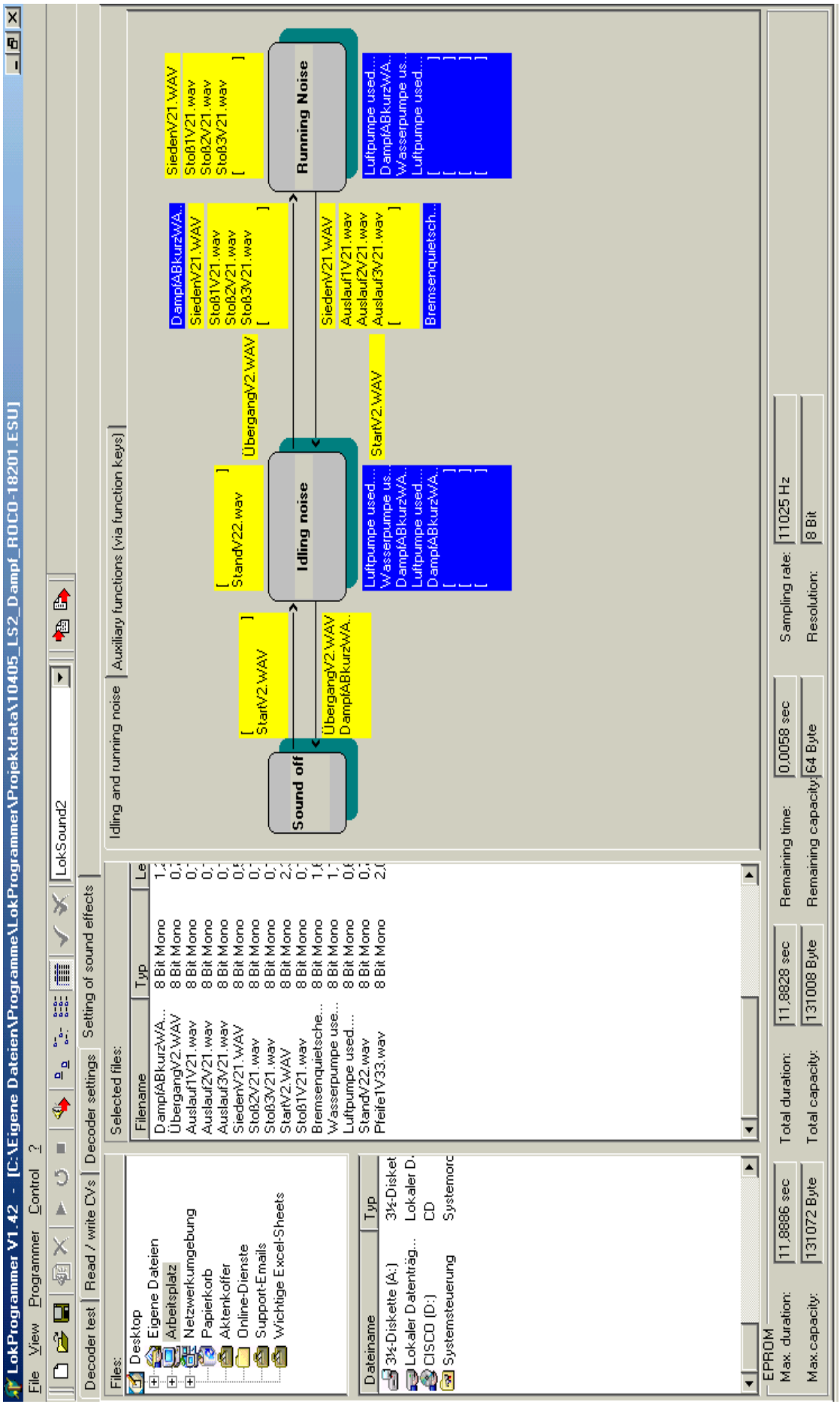

Figure 17: Compile Sound Files Main window

5.6.3 Select / Remove Individual Sounds for Projects

But how do you enter new sound fragments in the Flash Memory?

Figure 16 shows the display on the monitor. In the center column you will find a list of all sound fragments to be entered into the flash memory. The left top window shows a file tree exactly as it would be represented in Windows Explorer. The lower column on the left lists all sound files which are contained in the files selected above. In order to enter one of the sound files which may be either on your hard disk or the CD ROM provided into the list of sound files proceed as follows:

- Highlight the file by using the mouse and clicking on the file once.
- Click onto the button „Add Sound File" in the tool bar at the top of the monitor.
- Now the desired file appears in the list in the center column of the display.

To remove one of the sound files proceed as follows:

- Highlight the file in the center column and click once.
- Click onto the button „Remove Sound File" in the toolbar at the top.
- Now the file will be removed from the list of project files.

5.6.4.1 Suitable Sounds

Not all sound files, which you may have saved on your PC are suitable for use with LokSound projects.

Generally speaking all files that are saved in the Windows*.wav format are suitable for use with LokSound decoders. If they represent noise/music/or speech files it is absolutely immaterial.

The Windows*.wav format is the standard format for storing sound of any kind within the Windows system. The files may be from the CD ROM provided with the LokProgrammer or they may have been downloaded from the Internet or/ - and this is the most professional method - you may have produced them yourself. There are a number of applications available to generate wave data files. The most popular is the Windows Media Recorder. With this or a similar programm you can carry out audio recordings and then save them digitally as *.wav files on the hard disk. As raw material for such audio recordings we recommend a DAT- or any other high quality audio recorder.

In this booklet we cannot provide comprehensive instructions how you can digitalize sound data with the aid of your computer and how to store them on the hard disk. Please refer to chapter 7.2. There you will find instructions on how to install and use a professional audio recorder, which is on the CD ROM provided with the LokProgrammer. Please also refer to your manuals for your PC as well as the Audio Card, which will provide further information to this topic.

WAV- files can be saved in varying sound quality. The better the quality the larger the file.

For LokSound projects you can only use WAV- files with the following parameters:

Sampling frequency:	**11025Hz**
Resolution:	**8 Bit**
Number of channels:	**Mono**

5.6.4.2 Unsuitable Sound Formats

If you try to store a file in one of your Projects which does not comply to the above requirements the following error message will be displayed:

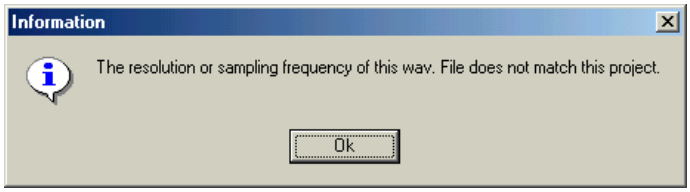

Figure 18: Error Message

You can check the format of a Wave-file at any time: Highlight the file in the list of your sound files, press the right mouse button and click onto PROPERTIES. A new window opens in which you click on DETAILS. Next to the entry Audio Format you will find relevant information regarding the format. Should the format be unsuitable you can load the file with any of the audio editors and convert it into a format which is suitable for LokSound Projects.

Another limitation when selecting sound files results from the size of the Flash Memory in the LokSound module: the memory has a maximum capacity of approximately 11.8 seconds of sound. Should you try to load a file into the Project which is larger than the available memory the following error message will be displayed:

Figure 19: Error Message

Exactly how much memory is still available (in seconds and bites) is displayed in one of the information fields at the lower edge of the monitor. This will tell you how much time of the memory is already occupied respectively how big it is.

If you want to save a file but do not have sufficient memory available you may have to remove some other sound fragments from the Project (refer to 6.4.4).

5.6.4.3 Listening to Sound Fragments

It is possible to listen to individual sounds before you load them into a Project. In order to do this, highlight the file which you want to hear by clicking onto it in the selection window (left column, lower half). Then you click on the button ▶ in the toolbar at the top of the screen. By clicking onto the button ↻ the sound will be played in loop mode until you click ■.

You can also use this method to listen to sounds which are already contained in your Project. Simply highlight the appropriate file in the center column of the display and push the ▶ button respectively ↻.

5.6.5 Assign Sound Fragments to Sound Slots / Reverse Assignments

All sound fragments which you want to assign to the various sound slots have to be entered into the list of the Project Sounds first. Only these sounds will be transferred to the LokSound module.

To assign a sound fragment to a certain sound slot you proceed as follows:

- Highlight the appropriate sound fragment in the list of sound files by clicking onto it with the mouse.
- Highlight the row within the sound slot where you want to allocate this particular sound fragment.
- Click onto the red tick on the toolbar at the top of the monitor.

To remove the assignment of a sound slot proceed as follows:

- Highlight the entry within the Sound slot, which you want to remove.
- Click the cross tick in the toolbar at the top of the monitor.

Besides a simple assignment you can apply additional settings for each Sound slot: Highlight the entry within the Sound slot (by clicking once with the mouse) and press the right mouse button. Select Properties in the window, which then displays the following menu:

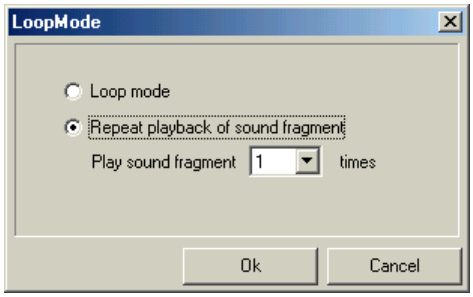

Figure 20: Loop Mode

In this menu you can select if the sounds should be played continuously or should be repeated a certain number of times. These features are very useful: Lets assume, you want to assign a bell to a certain function key. The bell should ring until you press the function key again. To achieve this you have to activate the repeat mode and the loop mode window. Another example is the random sounds to be played for a steam engine while stationary. You probably remember, that all random sounds to be played while idling are entered in sound slot 7. Lets assume, you have entered a sound fragment representing a water pump. In order to save memory you only store one beat of the pump. Naturally it is far more prototypical if the water pump works not just for one beat but a couple of times. If you enter the number of repetitions in the appropriate sound slot for the water pump the sound will now be played – whenever randomly selected – as often as the number of repetitions you have entered in the appropriate field.

5.6.6 Write New Sound Data onto Decoder

After you have completed all desired sound settings and have saved the entire Sound Project on the hard disk you can now download the sound files from the PC to the LokSound module. Place the locomotive on the programming track and click the button on the toolbar at the top of the monitor. This will open a window with further remarks. Click onto „continue" and the following window will be displayed:

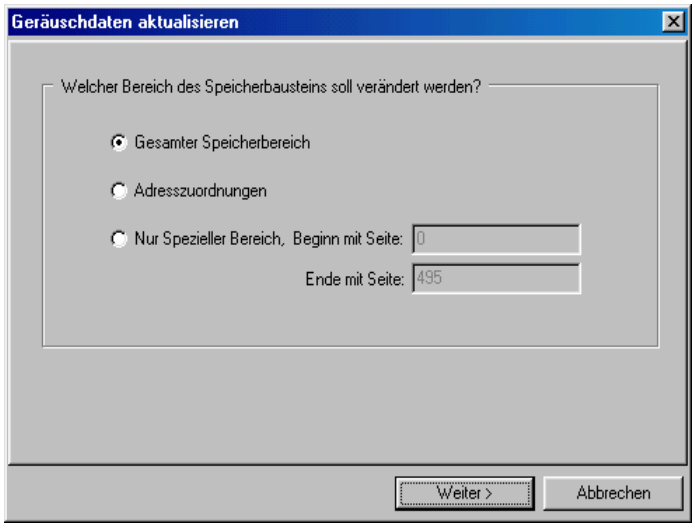

Figure 21: Write New Sound data on decoder

Now you can select which part of the sound data you actually want to update:

- Write all sound files: This option overrides all sound files on the LokSound decoder. Use this option whenever you have changed any entries in the sound project and you are not absolutely certain which sound files may already be stored in the LokSound decoder.
- Assignment of addresses: This option updates only the sequence plan of the Sound decoder. You should only use this option whenever you have only changed a few sound slots but the kind and number of actual sound fragments remains unchanged.
- Modify certain part only: This option allows you to select which part of the memory should be updated. This option is not useful for you as an end user.

6 Appendix

6.1 Installation of DirectX API

The LokProgrammer software requires a multimedia extension for MS Windows to drive the Audio Card. This extension – DirectX – is already present on all versions of Windows 98 as well as on Windows 95B respectively Windows 95C, Windows 2000 or WindowsXP. If you use an older version of MS Windows this interface may not be available. This will be indicated by an error message, which appears immediately after starting the programm.

The CD ROM provided with the LokProgrammer contains a multimedia interface DirectX version 8.1 which you can install without any problems. Proceed as follows:

- Click onto START on the Windows desktop and select the menu RUN.
- Type "x:\directx\dx81core.exe" in the newly opened window and replace the initial "x" by the name of your CD ROM drive (usually "d:").
- After clicking onto OK the installation programm of MS DirectX 6.0 will start. After you have confirmed all questions and remarks this extension will be installed on your PC.

Note: If you are not certain if the multimedia interface is already available on your PC or you have the impression that it doesn't work properly just use the above procedure to install it once again on your PC.If DirectX is already on your system, the installation program will inform you and if so we recommend you to abort the re-installation.

6.2 Installation of CoolEdit96 Shareware Version

There are a number of commercially available programs to generate audio files as well as to edit or convert Wave files. In order to provide you with a professional tool right from the beginning we have decided to supply you with an audio editor on the CD ROM provided.

The programm is called CoolEdit96 and originates from the American software house Syntrillium. CoolEdit96 is shareware, in other words you can install the programm on your PC, test it and then you decide if you want to purchase it. Payment is conducted in form of a registration fee to be paid directly to the author (further information is contained in the instruction manual for the software).

The shareware version of this programm is limited in such a way that it allows you only to use part of the functions of the programm at the same time. Please note that the OPEN FILE and SAVE FILE function is always available.

Please refer to the online instruction manual of CoolEdit96 for further information regarding how it works and all the additional features.

Please note that ESU electronic solutions ulm GmbH do not offer any support for CoolEdit and do not have any rights regarding this software. Simply consider this shareware version on our CD ROM as customer service by ESU.

To install this programm proceed as follows:

- Click onto START on the Windows desktop and select RUN in the menu.
- Type "x:\directx\dx6core.exe" in the newly opened window and replace the initial "x" by the name of your CD ROM drive (usually "d:").
- After clicking onto OK the installation programm of CoolEdit96 will start. After you have confirmed all questions and remarks this extension will be installed on your PC.

8 Service-Support and assistance

Your model train or hobby shop is your competent partner for all your questions regarding LokProgrammer.

You may also contact us directly. For enquiries please use either email or fax (don't forget to provide your own fax-no.) and we will reply within a few days.

Please call our hotline only in case of complex enquiries that can't be dealt with by email or fax. The hotline is often very busy you may encounter delays. Also check our website for more information. You will find many hints regarding FAQ and even feed back from other users.

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