

# MRS

## Terminal software

# User's Manual

Revision 1.3

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## DOCUMENT REVISION HISTORY

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1.0	05 April 2020	Original document
1.1	22 July 2020	Minor graphical and textual changes
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1.3	25 October 2021	Additional parameter for max temp. monitoring

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## 1. GENERAL

### 1.1. Software description

The MRS Terminal software enables the user of MRS EMS systems to define parameters of the EMS system, download and analyze logged data, and monitor measured values in real-time. Data logged with the MRS logger devices can either be analyzed directly in MRS Terminal or exported in .mdb format for further external analysis.

For a more detailed information about the MRS Terminal and other products, please visit MRS official website [www.mrs-electronic.com](http://www.mrs-electronic.com).



Figure 1.1. MRS EMS System overview

## 2. INSTALLATION

### 2.1. Prerequisites

#### 2.1.1. PC (Windows)

Minimum requirements for the PC are as listed below:

Component	Minimum system requirements
Operating System	Windows 7 or higher (32-bit) / (64-bit)
Processor	1.6 GHz
Memory	Minimum 4 GB RAM
Other	Mouse, Keyboard, CD-ROM drive, USB port

**Table 2.1.** Minimum requirements for the PC

#### 2.1.2. MRS Logger

MRS Terminal software currently supports logger models listed below:

Supported loggers
MRS LogBase 04
MRS LogBase 36

**Table 2.2.** Currently supported logger models

#### 2.1.3. USB – CAN Adapter

MRS Terminal is only compatible with the PEAK PCAN - USB adapter.

## 2.2. Installation procedure

### 2.2.1. Installation of the Software

The first step of the installation procedure is to remove any interface connected to the PC, like the CAN-USB adapters. To install the software, you need administrator's rights for the PC in question. Next, right-click on the MRS Terminal installation file(.exe) and select "Run as administrator" and follow the installation procedure.

**IMPORTANT:** Crucial step for correct software installation is using admin rights (i.e., Run as administrator), otherwise various bugs are possible.

### 2.2.2. Installation of the Driver

Connect the USB adapter to a USB port of your PC. The Microsoft Windows operating system should automatically detect the hardware, and if necessary, will install the requisite driver.

*Note:* USB adapter should be connected to PC alone, otherwise if adapter is inserted in the PC after a running logger has been connected to the USB adapter, the PC may identify it as the input device.



**Figure 2.1.** USB adapter

Also, the PCAN- USB driver installation file(.exe) will be available in case the PC does not detect hardware automatically.

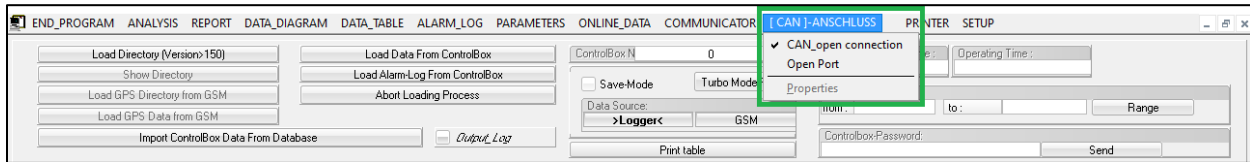
Otherwise, you can download the driver setup from the link below:

<https://www.peak-system.com/quick/DrvSetup>

## 2.3. Initial configuration

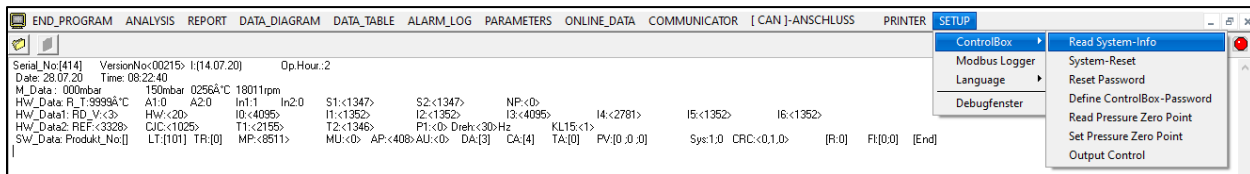
After a successful software and driver installation the system can be connected using an MRS Terminal connection interface.

The following step after starting the software is activating CAN communication. Run the MRS Terminal software and from the communication drop-down menu, select the CAN\_open\_connection button (if not already selected). Close the MRS Terminal software.



**Figure 2.2.** Activating CAN communication

Start the MRS Terminal software again and from the SETUP drop-down menu select ControlBox -> Read System Info. The snapshot below is example of Read System Info. If you receive similar data, logger is successfully connected.

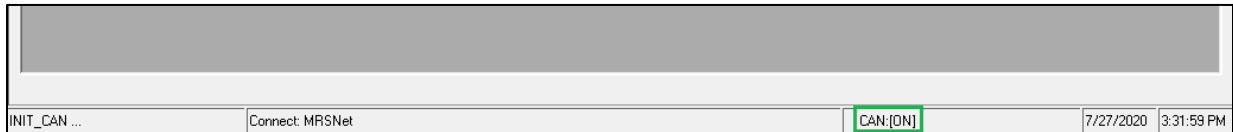


**Figure 2.3.** Logger successfully connected

## 3. CONNECTING THE LOGGER TO MRS TERMINAL

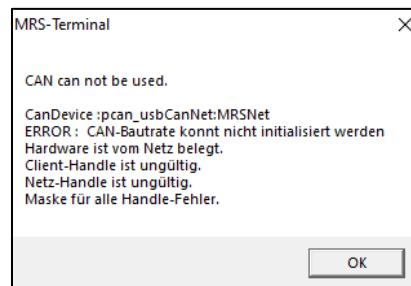
Process of connecting the logger device to the MRS Terminal software is as follows:

- Make sure that the MRS Terminal software is closed, and CAN-USB interface is disconnected from the USB port
- Make sure that the logger device is switched on (connected to a power supply, ignition signal active)
- Connect the CAN bus interface to the PC USB port
- Plug the logger's communication connector to the CAN-USB adapter
- Start the MRS Terminal software
- Now, when the software is started, the adapter will be recognized; this is confirmed by the "CAN:[ON]" message that appears along the bottom edge of the screen.



**Figure 3.1.** Adapter is connected

If the software is started and message below (Figure 3.2.) appears, it means that the adapter is not connected or recognized. Once the software is opened message "CAN:[OFF]" will be displayed on the bottom of the screen. In that case, close the software, check the connections, and run the software again.



**Figure 3.2.** Adapter is not connected or recognized

*Important:* Always connect CAN-USB adapter before starting the software and make sure that CAN communication is selected.



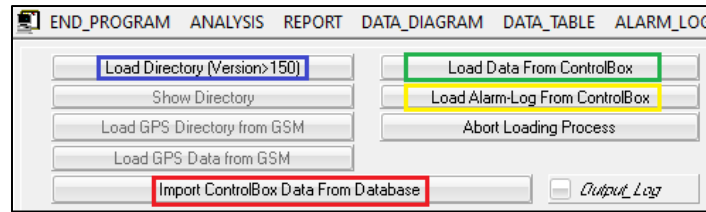
## 4. MRS TERMINAL FUNCTIONS

### 4.1. Overview

An overview of MRS Terminal function is given below:

<b>Analysis</b>	Import data from the logger, data analysis
<b>Report</b>	Graphical representation of data
<b>Data Diagram</b>	Visual data analysis
<b>Data Table</b>	Table representation of data (date, time, parameters value)
<b>Alarm Log</b>	Log of generated alarms, changes to parameters
<b>Parameters</b>	Import, export of parameters, parameter settings
<b>Online Data</b>	Parameter values displayed in real time
<b>Setup</b>	Additional functions

## 4.2. Analysis



**Figure 4.1.** Analysis tab

### 4.2.1. Load Data

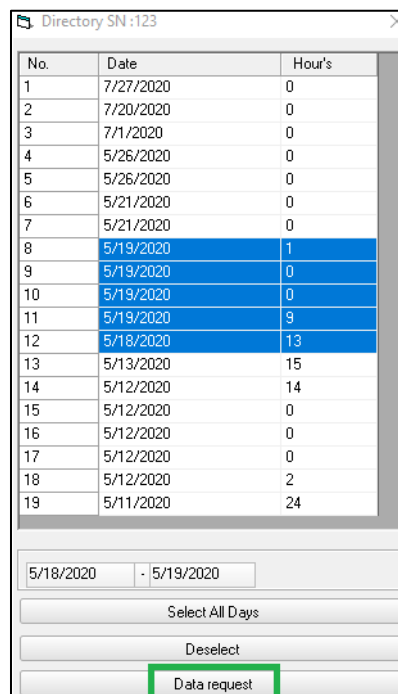
If the logger is connected via the CAN-USB adapter, you can initiate a data download directly by clicking on “Load data from the ControlBox” (Figure 4.1., outlined in green). This will download parameters, the alarm data, all the log data and various items of further system information from the logger. Unless you specified a different folder when you installed the software, the storage destination for this downloaded information will be the C:\MRS-Terminal\DATA folder.

### 4.2.2. Load Alarm Log

If you just want to download the Alarm data gathered by the logger, click on “Load Alarm-Log From ControlBox” (Figure 4.1., outlined in yellow).

### 4.2.3. Load Directory

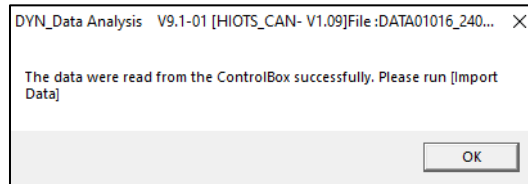
Data download can take up to 1 hour, or even longer, if there is a large volume of data to be downloaded. If you are only interested in the data gathered in a particular period, you can select the data you require by clicking on “Load Directory” (Figure 4.1., outlined in blue). This option enables the user to select the period from which he would like to download data. To start the download, click on “Data request”.



**Figure 4.2.** Request data for selected period

## 4.2.4. Import Data

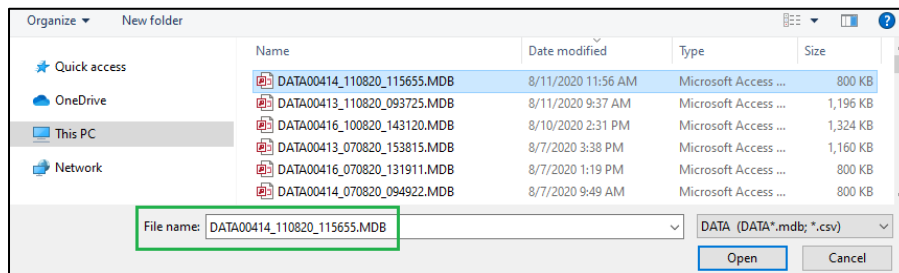
After a successful download, the following dialog window will appear:



**Figure 4.3.** Dialog window indicating that data has been successfully loaded

However, the data and the data parameters are not automatically displayed in the program; they must first be imported from the database. To do this, click on “Import ControlBox Data From Database” (Figure 4.1., outlined in red).

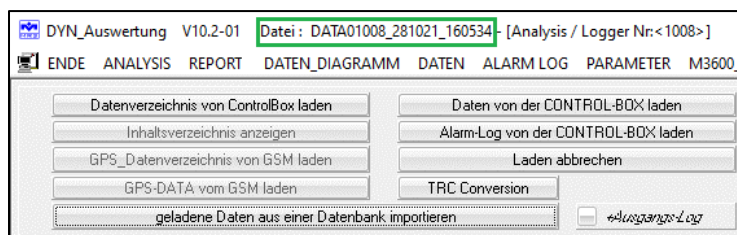
The file name assigned to the download consists of the serial number of the logger, plus the date and time of day of the download (Figure 4.4.).



**Figure 4.4.** Database

After the file is opened you can see and analyse the data recorded and the statistics compiled in the “Analysis”, “Report”, “Data Diagram”, “Data Table”, “Alarm Log” and “Parameters” dialog windows.

If the data is successfully imported, the file name of imported data and logger serial number will appear on the top of the software window (Figure 4.5).



**Figure 4.5.** Successfully imported data

*Important:* Prior to generating any types of graphs or tables, you need to import data that was previously loaded from the logger.

## 4.3. Report

The “Report” function provides a statistical overview of pressure, temperature, and engine speed parameters during the period for which data has been downloaded and imported. In addition, the report provides information about mean and maximum values. This information appears under the graphical representations.

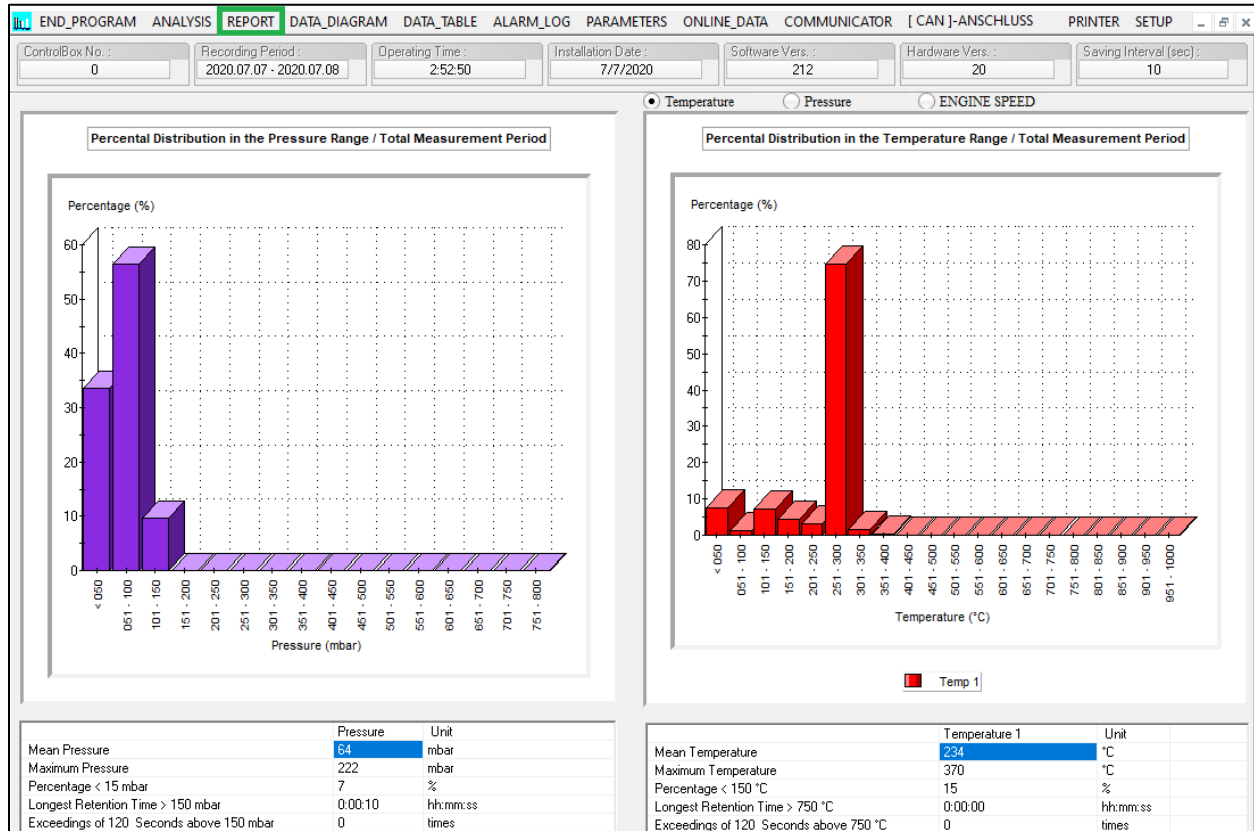


Figure 4.6. Example of reported data

## 4.4. Data Diagram

The “Data Diagram” tab makes it easier to monitor and analyze the data imported from data logger in form of graph.

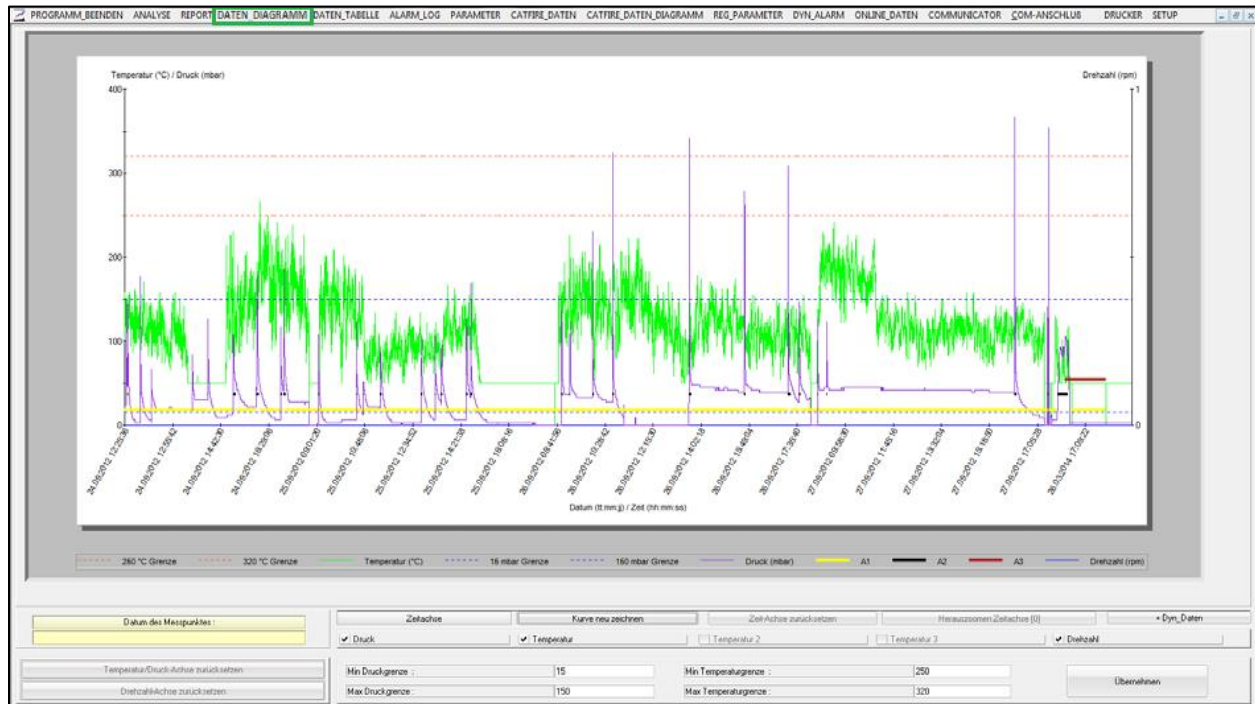


Figure 4.7. Data diagram

You can zoom in on individual areas of a diagram by clicking on the starting position of the area you are interested in, and then marking it by holding down the mouse button and dragging the mouse pointer over the area in question. When the mouse button is released, the area of interest is automatically magnified. To return to the original overview, click on “Reset time axis” or “Renew curve” (both Figure 4.8., outlined in red).

Any lengthy periods of inactivity during the recording of data are edited out to eliminate unnecessary intervals in the graphical representation. However, if necessary, these can be edited back in (and out again) by clicking on the “Time axis / Real time” toggle button (Figure 4.8., outlined in green).

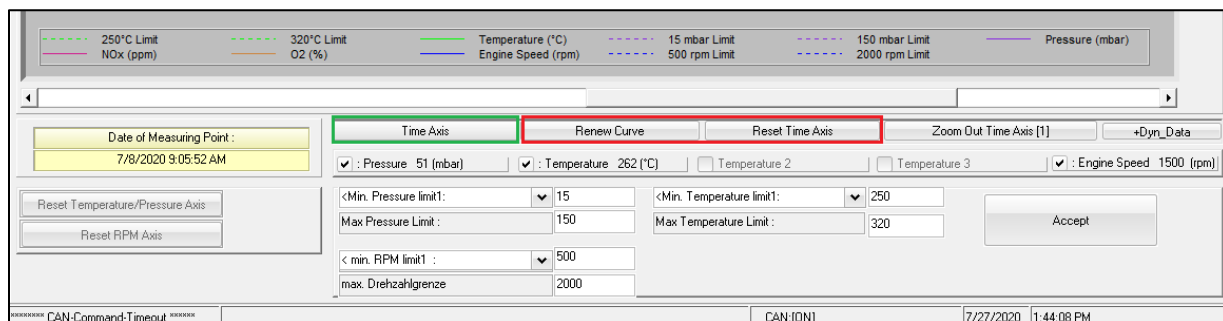
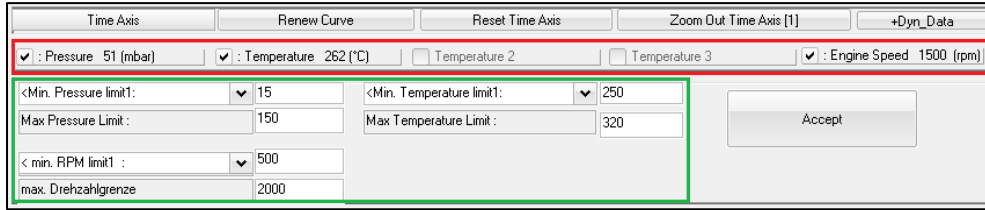


Figure 4.8. Data diagram functions

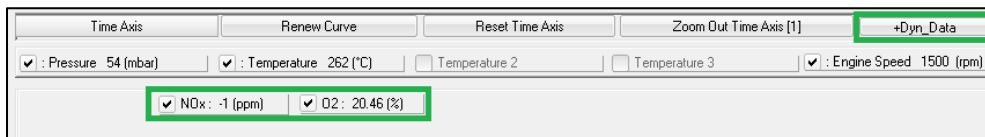


**Figure 4.9.** Data diagram values

As you move the mouse pointer over the graph, the values at the location of the pointer are displayed under the diagram (Figure 4.9., outlined in red). By setting/removing ticks in/from the corresponding boxes, individual curves can be edited in/out.

The upper and lower limits (Figure 4.9., outlined in green) can be set as desired and they do not relate to the alarm parameters that have been set in the logger. Enter the desired values in the appropriate fields and click on “Accept”. When values are changed, the graph will change accordingly, as will the evaluation of statistics in the Report window, and in the Analysis window.

Additional data is available by clicking on the “Dyn\_Data” button and checking the appropriate checkbox (Figure 4.10.).



**Figure 4.10.** NOx and O<sub>2</sub> checkbox

## 4.5. Data Table

END_PROGRAM ANALYSIS REPORT DATA_DIAGRAM <b>DATA_TABLE</b> ALARM_LOG PARAMETERS ONLINE_DATA COMMUNICATOR [ CAN ]-ANSCHLUSS PRINTER SETUP						
Print table						
No.	Date/Time	Pressure (mbar)	Temperature (°C)	Drehzahl / rpm	NOx / ppm	O2 / %
176	7/7/2020 9:48:24 AM	36	270	1500	0	20.41
177	7/7/2020 9:48:34 AM	36	274	1500	0	20.41
178	7/7/2020 9:48:40 AM	36	274	1500	0	20.41
179	7/7/2020 9:49:22 AM	36	270	1500	0	20.41
180	7/7/2020 9:49:32 AM	36	270	1500	0	20.41
181	7/7/2020 9:49:42 AM	36	270	1500	0	20.41
182	7/7/2020 9:49:52 AM	36	270	1500	0	20.42
183	7/7/2020 9:50:02 AM	36	270	1800	0	20.42
184	7/7/2020 9:50:12 AM	36	270	2400	0	20.42
185	7/7/2020 9:50:16 AM	36	270	2400	0	20.42
186	7/7/2020 9:50:52 AM	36	274	2100	0	20.41
187	7/7/2020 9:51:02 AM	36	274	2100	0	20.42
188	7/7/2020 9:51:12 AM	36	274	2100	0	20.42
189	7/7/2020 9:51:22 AM	36	274	2100	0	20.42
190	7/7/2020 9:51:32 AM	36	274	2100	0	20.42
191	7/7/2020 9:51:42 AM	36	274	2100	0	20.42
192	7/7/2020 9:51:52 AM	36	274	2100	0	20.42
193	7/7/2020 9:52:02 AM	36	270	2100	0	20.42
194	7/7/2020 9:52:12 AM	36	270	2100	0	20.42
195	7/7/2020 9:52:22 AM	36	270	2100	0	20.42
196	7/7/2020 9:52:32 AM	36	270	2100	0	20.42
197	7/7/2020 9:52:42 AM	36	274	2100	0	20.42
198	7/7/2020 9:52:52 AM	36	274	2100	0	20.42
199	7/7/2020 9:53:02 AM	36	274	2100	0	20.42
200	7/7/2020 9:53:12 AM	36	270	2100	0	20.42
201	7/7/2020 9:53:22 AM	36	270	2100	0	20.42
202	7/7/2020 9:53:32 AM	36	270	2100	0	20.42
203	7/7/2020 9:53:42 AM	36	270	2100	0	20.42
204	7/7/2020 9:53:44 AM	36	270	2100	0	20.42

\*\*\*\*\* CAN-Command-Timeout \*\*\*\*\*

CAN:[DN] 7/27/2020 2:54:32 PM

Figure 4.11. Data table

The data table contains all the data sets recorded for the period that has been downloaded. Date, time, parameter values are provided in each data set.

## 4.6. Alarm Log

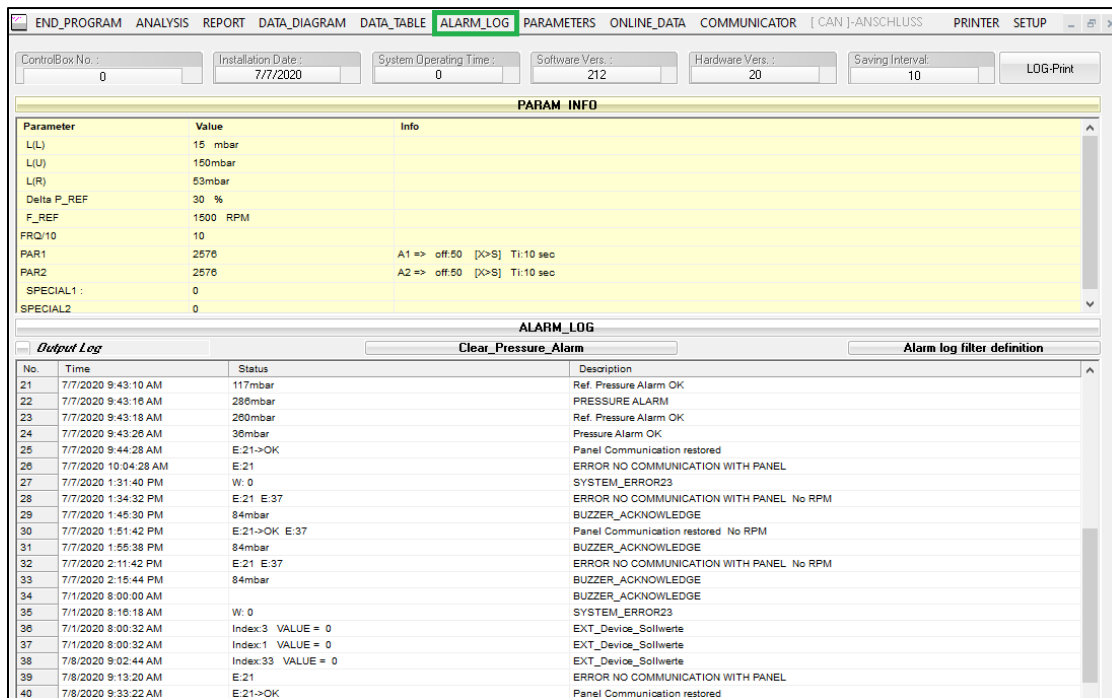


Figure 4.12. Alarm log

For a faster overview of key data, some of the most important data provided by the logger are listed in the top section of the window. The bottom section of the window contains a list of all the alarm reports that have been generated, including reports about changes to parameters made by users.

Display of logger switching events can be generated by checking the “Output Log” checkbox (Figure 4.13., outlined in green). These events are then added in correct chronological order to the list of alarm reports. This facilitates the identification of correlations between switching events and the occurrence of errors.

To search for specific errors, use the “Alarm log filter definition” button (Figure 4.13., outlined in red). The pop-up window that is superimposed on the Alarm Log table (Figure 4.13.) allows you to select and display various errors.

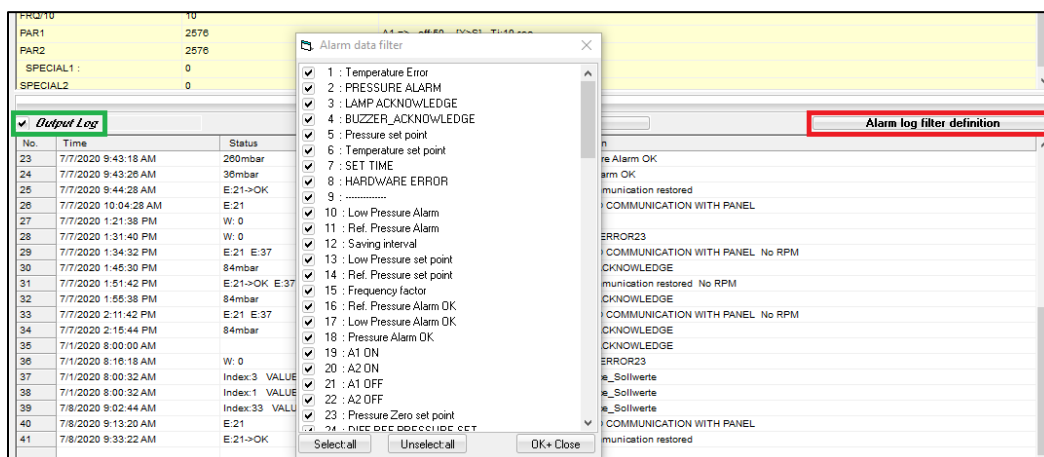


Figure 4.13. Alarm log filter



## 4.7. Parameters

In the “Parameters” window, you can retrieve parameters from the logger or from a file. After you have finished processing them, you can store them in the logger or file. In addition, you can set the logger time.

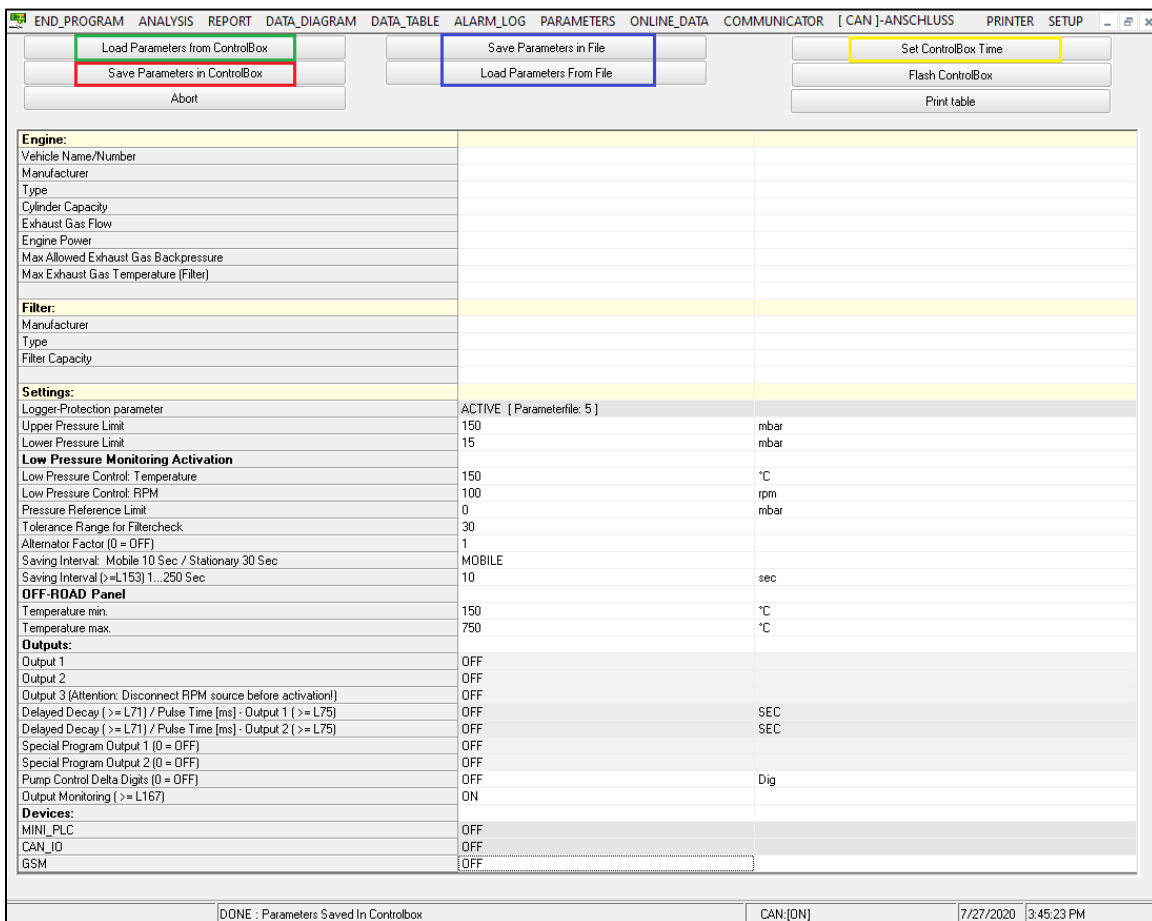
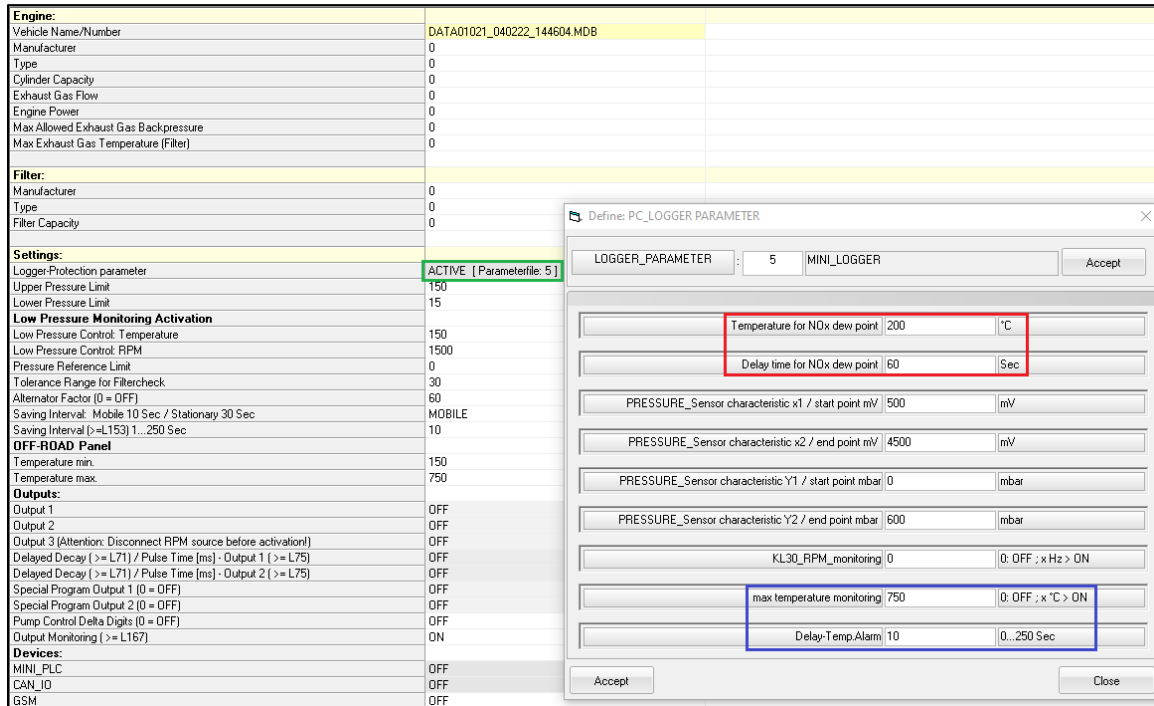


Figure 4.14. Parameters tab

Before attempting to retrieve the parameters, make sure that the logger is connected properly. Click on “Load Parameters from ControlBox” (Figure 4.14., outlined in green). Parameter values become available for use as soon as they are retrieved into the window.

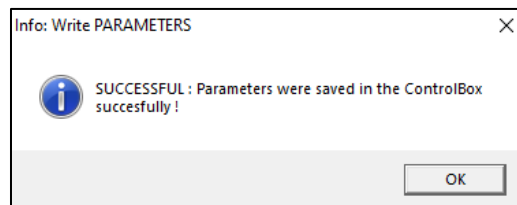
To define NOx sensor activation conditions, click ACTIVE [Parameterfile: 0] (Figure 4.15., outlined in green). The pop-up window will appear. In the “LOGGER\_PARAMETER:” field insert number “5” and then press “Accept” on the upper right side. The next step is to define “Temperature for NOx dew point” and “Delay for NOx dew point” (Figure 4.15., outlined in red). The dew point is the temperature at which there will be no moisture in the exhaust system which can damage the NOx sensor. For example, defining a temperature of 200 °C and a delay time of 60 seconds would mean that the NOx sensor will start operating when the temperature in the exhaust system is at least 200 °C for 60 seconds and when the temperature drops below 200 °C the NOx sensor will stop working.

For monitoring the maximum temperature please define the desired temperature value and alarm delay time. Adjust the values in the "max temperature monitoring" and "Delay-Temp.Alarm" field according to your needs (Figure 4.15., outlined in blue).



**Figure 4.15.** NOx and Temperature sensor parametrization

After the parameters have been set to meet your specific requirements, they need to be transferred to the logger by clicking “Save Parameters in ControlBox” (Figure 4.14., outlined in red).



**Figure 4.16.** Message indicating that parameters are saved

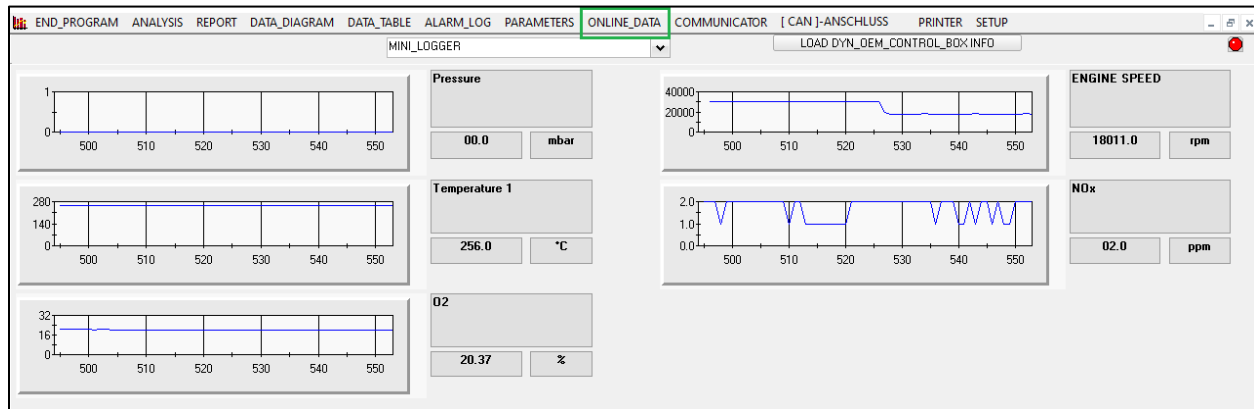
If you know that you will be using a specific set of parameters on a regular basis in several loggers, it may be worth your while to store this set in a parameter file that you can retrieve when necessary. To do this, use the “Load Parameters From File” and the “Store Parameters in File” functions (both Figure 4.14., outlined in blue).

“Set ControlBox time” button (Figure 4.14., outlined in yellow) transfers the date and time entered in your PC to the logger.

*Note:* When changing the parameters confirm the input by pressing the “Enter” key on your keyboard, otherwise parameters may not be saved when using “Save parameters in ControlBox” function.

## 4.8. Online Data

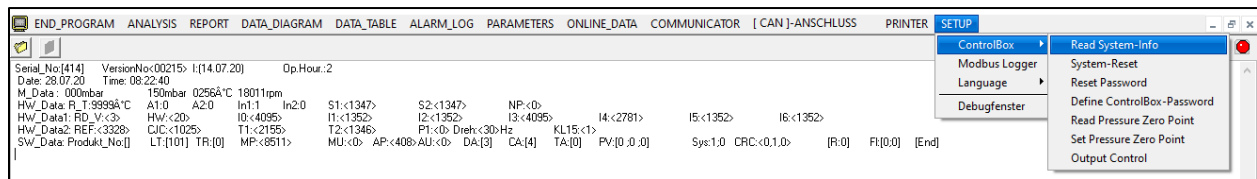
Real-time monitoring of data measured by the data logger becomes possible by clicking on the “Online Data” button. From the drop-down menu select the “MINI\_LOGGER” option.



**Figure 4.17.** Online graph

*Note:* If the logger is not properly connected to PC and switched on, online data will freeze. Use this functionality to check if the logger is online.

## 4.9. System Info



**Figure 4.18.** System information

When the logger is connected, important system information, like serial number, software version, commissioning date, current date and time, parameters value and other advanced information for hardware and software can be retrieved from it by means of the “Read System Info” function.

*Note:* Use this function to check if the logger is online. If it is not online or properly connected, no information will be displayed.

## 5. TROUBLESHOOTING

If you notice any unexpected system operation, please contact your distributor.

## 6. TECHNICAL SUPPORT

If you require our technical support, please feel free to reach us using the following:

E-mail	<a href="mailto:support@mrs-electronic.com">support@mrs-electronic.com</a>
Website	<a href="http://www.mrs-electronic.com">www.mrs-electronic.com</a>
Address	MRS ELECTRONIC GmbH & Co. KG Klaus-Gutsch-Str. 7 DE-78628 Rottweil Germany

## 7. TERMS OF USE

For details regarding Terms of use please refer to the MRS website ([www.mrs-electronic.com](http://www.mrs-electronic.com)).