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PM 8550 Calibration Software

Operation Manual

PM 8550 Calibration Software Total number of pages: 18

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1 Safety

1.1 Electrostatic Discharge

CAUTION:
Do not mount the Colour Sensor on the colour monitor screen before the Colour Sensor, the Display Unit, and the PC are connected together.

A CRT is a high-voltage device, and the screen may at times carry an electrostatic charge. To prevent this charge from entering the PC the connections between the elements must be established before the Colour Sensor is placed onto the Colour Monitor CRT.

1.2 Handling Diskettes

If you always follow the few simple rules outlined below, your diskettes should not give you any problems.

- Never try to bend a diskette
- Never leave a diskette in the vicinity of a strong magnetic field (for example, near a telephone, loudspeaker or electric motor); doing so could erase the files
- (3,5-inch diskettes only) the sliding cover protects the diskette surface and automatically slides back when the diskette is inserted in a drive. Do not slide it back yourself!
- Store your diskettes at a temperature between 10^{o} C and 50^{o} C. (Room temperature is usually between 20^{o} C and 25^{o} C)
- Store your diskettes in a dry place - excessive humidity will damage them

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2 Introduction

The PM 8550 Calibration Software package may be used on IBM-compatible PCs to perform field/user calibration of the PM 5639 series CRT Colour Sensors.

This software enables the user to recalibrate the colour and/or luminance references for the colour sensor. The colour sensor should be placed on a monitor with a white window of known colour co-ordinates and/or luminance. These values should be established by some other means, e.g. by a spectroradiometer or a white comparator. The calibration procedure then employs the monitor and the calibration values as the basis for a recalibration of the colour sensor.

2.1 Package Contents

The PM 8550 Calibration Software package contains:

1 1.44K 3.5” diskette, IBM compatible and containing the complete program

1 Triple connector interface cable to connect type PC, the display unit, and the colour sensor

1 2.5 mm Allen key

1 Operating manual

I Ring binder containing the complete system

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3 Technical Data

3.1 Hardware Requirements

- -PC
- -Floppy disk drive 3.5”
- - MS-DOS operating system. Also runs on Windows 95 or 98 in a DOS box
- -Serial port COM1: RS232 interface, address 03F8 HEX, interrupt IRQ4

The software is stored on 1.44K 3.5” diskette.

The software can be run from a diskette, but a hard disk is recommended.

3.2 Calibration Units

Chrominance:
The chromaticity coordinates may be expressed in:
- CIE 1931 xy,
- CIE 1976 u'v', or
- CIE 1960 uv values.

Luminance:
The value may be expressed in:
- Cd/m^2
- NIT, or
- ftL

3.3 Mechanical Data

Shipment box dimensions:

Height:	50 mm	(2")
Width:	360 mm	(14")
Depth:	275 mm	(11”)

Weight: 1.5 kg (3 lbs)

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4 Installation

4.1 Initial Inspection

Check the contents of the package for possible damage and to make sure nothing is missing. If the contents are incomplete or damaged, a claim should be filed with the carrier immediately, and the DK-Audio should be notified in order to facilitate the repair or replacement of the instrument.

4.2 Making a Backup of Your Diskette

Before you begin the installation process, you should make a backup copy of the Calibration Software diskette in case something happens to the original. To do so, first boot your computer. Place the Calibration Software original diskette in drive A and a formatted diskette in drive B. Type: **DISKCOPY A: B:** and press **ENTER**.

Or for a single drive, type: **DISKCOPY A: A:** and press **ENTER** . Press **ENTER** again when the computer asks you to confirm that you have the diskettes properly placed.

Keep your PM 8550 Calibration Software backup copy in a location different from that of your original diskette.

The diskettes contain 2 files:

PM8550.EXE Calibration program
README Information file about the program and the latest changes

If you want to run the software from a hard disk, please copy the PM8550.EXE and README files from the diskette to the hard disk. To do so:

1. Type C>**copy a:pm8550.exe**
2. Press **ENTER**.
3. Type C:>**copy a:readme**
4. Press **ENTER**
5.

4.3 Connection

CAUTION.
Do not make or remove any connections between the instrument parts when the power is switched on.

- Use the cable supplied with PM 8550 to connect the colour sensor, the display unit, and the serial port (COMI) of the PC. Please make the connections according to the directions on the labels on the connectors. If your computer has a 25-pin sub-D connector, use the 25-pin to 9-pin adaptor supplied.

- Turn the Colour Analyser display unit ON.

Note: The LCD display in the display unit will show "No Sensor". This is not an error. The display unit does not communicate with the colour sensor; its only function at this point is to supply the colour sensor with power. The display unit will switch itself off after 10 minutes if no key on the display unit is pressed.

Alternatively the power supply box for the PC and Industrial version of the PM5639 series can be use for delivering power to the Sensor head

For both kind of supply of power:

- Switch on the computer and start the PM8550.EXE program *(See Chapter 5.)*

5 Operating

5.1 Starting the Calibration Software

Before you start your PM 8550 Calibration Software for the first time you should have made backup copies of the diskette. *See Chapter 4,"Installation"*
See the file README to see the latest changes.

5.1.1 Running the Software from a Hard Disk.

- Make sure that you are in the sub-directory into which you copied the software
- Type **PM8550** and press **ENTER** . The PTV logo and DK-Audio name will then appear on your screen. The software serial number will also be displayed
- Press **ENTER** to get the PM 8550 main display screen

The program will then enter the main display screen. To proceed, see section 5.2 "Operating the Menus".

5.1.2 Running the Software from a Floppy-Disk System

- Make sure the DOS prompt A> (B> if you are using the B diskette drive) appears on your screen
- Insert your working copy of the PM 8550 program disk into drive A (B)
- Type **PM8550** and press **ENTER** . The PTV logo and DK-Audio name will then appear on your screen. The software serial number will also be displayed
- Press **ENTER** to get the program PM 8550 main display screen

The program will then enter the main display screen. To proceed, see section 5.2 "Operating the Menus"

5.1.3 Baud Rate Selection

The default baud rate is 4800 baud. For colour sensors set up for 9600 baud the program can be started with a parameter to select 9600 baud. Just type PM 8550/B:96 and press **ENTER**

5.2 Operating the Menus

The top line is called the "Main Menu Line". You may choose an item by using the arrow left (←) and arrow right (→) cursor controls and then select by pressing **ENTER** . Some of the items call up a sub-menu. In a sub-menu, make your selection by using the arrow up (↑) and arrow down (↓) cursor controls and then select by pressing ENTER .

Pressing **F1** always calls up the context-sensitive help function with information about the feature you are using.

To leave a sub-menu or any other window, press the **ESC** key.

5.2.1 The Main Display Screen

Read Status:
The status of the attached colour sensor is read into the "Calibration Status" field. This is also done automatically when the program is started.

Write Protect:
This is used to enable/disable the write protection of the colour sensor. The program automatically gives you an explanation of the procedure needed for the version of colour sensor you are working with.

Calibration Setup:
The Calibration Setup sub-menu is used to change the chromaticity coordinate and luminance unit. The default options are CIE 1931 xy for the chromaticity coordinates and Candela/m 2 for the luminance unit.

Data:
This is used to enable the Data field for entering new calibration data.

Restore:
By selecting this item, you replace any previously performed user calibration with the original factory programmed values. This ensures that you can always restore the original factory programming.

Start Cal:
Is used to start the calibration of the Colour Sensor, with the data in the Data field.

Help:
This item displays the general text window for the program.

In the bottom line you have entries which you may select by "direct" keys.

F1 - Help:
This activates the context sensitive help function. Pressing **F1** gives you information on the mode in which you are operating.

ALT+X – Exit:
Simultaneously pressing the **ALT** and **X** keys will terminate the program.

5.2.2 The "Calibration Status" Field

The Calibration Status field shows the status of the connected colour sensor. Four parameters are displayed.

Sensor: **KU XXXXXX**
The serial number of the colour sensor.

Calibration: **FACTORY or USER**
The active calibration reference, which may either be the factory programmed reference or previously employed user programming.

Write Protect: **ON/OFF**
The status of the write protection (either hardware or software, depending on the series) in the colour sensor may be ON or OFF.

User Text: **_____**
A 10-character text strings that the user may program, e.g. for later identification. No characters are factory-programmed into this string.

5.2.3 The "Calibration Data" Field

The Calibration Data field shows the parameters that are to be programmed into the colour sensor for use as reference. The data field is empty when the program is started. You may enter calibration data into the fields. The units shown correspond to the default selection in the Calibration Setup Sub-Menu. Selection of Calibration Setup makes it possible to change the colour chromaticity system and the luminance unit. To do so, move the cursor to Calibration Setup and press **ENTER**.

5.2.4 The "Calibration Setup" Sub-Menu

The Chromaticity coordinates may be entered in one of three systems:

CIE 1931 xy: The chromaticity coordinates keyed in should be in the CIE 1931 Chromaticity system

CIE 1976 uV: The chromaticity coordinates keyed in should be in the CIE 1976 Chromaticity system

CIE 1960 uv: The chromaticity coordinates keyed in should be in the CIE 1960 Chromaticity system

Note: The standard version of the PM 5639/00 does not show results in this system, though it is possible to use the system in the reference calibration procedure.

For the luminance unit there are three possibilities:
- Cd/M2,
- NIT and
-ftL

5.3 How to Calibrate:

Colour Reference, Luminance Reading, and User Text Field

The reference values for the reference monitor must be established by some means other than the Colour Sensor, e.g. by a spectroradiometer or another colour analyser used as reference. The meter reading is the value the colour analyser must show after calibration, e.g. x = 0.313, y = 0.329, Luminance Y = 85 Cd/m 2, and user text "User 1

- Connect the Colour Sensor, the Display Unit, and the PC using the special interface cable
- Turn on the Display Unit. The display should show the warning "No Sensor", even though the Sensor is connected
- Turn on the PC and start the PM 8550 program

- The program will show the PTV start picture; press **ENTER** to continue. The program automatically reads the status of the Colour Sensor at the start and shows this in the

Calibration Status field. The Calibration Data field will be empty, since no parameters have yet been specified.

- If the write-protect function is ON *(see the Calibration Status field),* move the cursor to "write protect" and press ENTER, and then follow the instructions given to remove the write-protect. If the write-protect is OFF, you may proceed by following the instructions in the next paragraph.

Note: It is very important that the instructions in the write protect ON/OFF menus is followed exactly.

- The calibration data are as default-selected to CIE 1931 xy chromaticity coordinates and the default luminance unit is Cd/m ^{2} . To change these settings, select **Calibration Setup** in the main menu line and press **ENTER** .Select the appropriate CIE chromaticity colour system and press **ENTER** Then select luminance unit and press **ENTER** .

Press **ESC** to close the **Calibration Setup** window.

- To enter the Calibration Data field select **Data** in the main menu line and press **ENTER** Write the data of the reference screen (the screen, which is used as reference in the calibration). To select the different items use the arrow key up/down. To end entering the calibration data press **ENTER**.

The chromaticity coordinates cannot be calibrated without calibration of the luminance value but it is possible to calibrate the luminance without calibrating the chromaticity coordinates.

The User Text field enables the user to write a 10 character string in the Colour Sensor. If you do not write anything in this field the "old" text will remain. To delete a previously programmed text, enter a space in the field.

- You are now ready to calibrate the Colour Sensor. Check that the Colour Sensor is on the screen of the reference monitor. Once you have checked the values, you start calibration by moving the cursor to the Start Cal field and pressing **ENTER** . The calibration of the Colour Sensor now takes place and the Calibration Status field is updated automatically.

IMPORTANT NOTE
The new calibration values are first valid after a Power off/on sequence.
(If this power off/on isn't performed, the old values are used and not the values as described previously in this paragraph).

6 Error Messages

6.1 Description of error messages

Error # 1:
COM1 initialisation failed - program halted
The program could not find the serial COM1 port. The PC may be a type without COM1 port, or the IO-address is not as expected 03F8 (Hex).

Error #2:
Video adapter initialisation failed - program halted
The program could not find the video adapter. The video adapter has to be"-4$ EGA-, or VGA compatible.

Error # 10:
Chromaticity coordinates outside limits
The legal range for the chromaticity coordinates is limited to the following range 0. 100 to 0.600. Please enter values in this range.

Error #11:
Luminance value outside limit
The legal range for the luminance value is 10 - 1000 NIT or cd/m ^{2} (29 - 291 ftL). Please enter a luminance value in this range.

Error #20:
Sensor NOT a CRT Colour Sensor
The connected sensor is not a type, which can be calibrated by use of the PM 8550 Calibration Software.

Error #21:
Check that the display unit is ON
Check sensor connection with display unit. The program can not get into contact with the Colour Sensor. The Display Unit may have entered power-down mode. Please check that the display unit is ON or the cable connections may be interrupted.

Error #22:
No connection with sensor
The connected device is not recognised as a colour sensor.

Error #23:
Sensor is write protected and user calibration is not possible. Please use the menu "Write Protect"
The program has detected that the Colour Sensor is write protected. To perform the calibration please follow the instructions given in the menu "Write Protect".

Error #24:
Colour Sensor is already factory calibrated
An attempt to reset a Colour Sensor to factory calibration has failed because the status was already factory calibration.

END OF DOCUMENT