Installation Instructions

GOSSEN METRAWATT

METRAwin 90

Calibration Software

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We make every effort to keep these instructions up-to-date in accordance with the latest software version. It is nevertheless possible that differences may exist between the software and the instructions. Further information and corrections may be provided in a "README.TXT" file included on the provided data storage medium or in the program directory after the software has been installed. Use the Windows Notepad to read this file.

Subject to change without notice.

Preface

Contents of the Installation Instructions	This document provides information regarding the purpose and range of applications, as well as the most significant features and system requirements of METRAwin®90 calibration software. It describes the necessary procedures for software installation and initial start-up of the calibration system.
	Note: Information regarding use of the software can be accessed by means of the integrated online help function. Online help can be displayed via the help menu, and printed out if necessary. Detailed information regarding device-specific functions and their use is included in the operating instructions for the respective devices.
Target Group	These instructions are intended for users of the software, as well as the system administrator if the software is not installed by the user himself. The software is designed for use with the Microsoft Windows® graphic user interface. Users must be familiar with basic Windows® functions.
Scope of Validity	These instructions are valid for METRAwin®90 as of version 4.00.
	Note: The version number is specified on the program CDROM. It is also displayed when program installation is initialized or when the installed program is started and can be displayed via menu **Help : About** as well.
Support	If you have any questions regarding use of this software, please contact

- your GOSSEN METRAWATT sales representative,
- the address which can be accessed under menu **Help : About**:
  GMC-I Messtechnik GmbH
  Product Support Hotline
  Phone: +49 911 8602-0
  Fax: +49 911 8602-709
  E-Mail: support@gossenmetrawatt.com

Contents

1   Product Description

1.1   Program Variants and their Application

METRAwin®90 calibration software is a multilingual Windows program for controlling various calibrators for electrical quantities with the help of a PC, and for documenting calibration results.

The program is available in the following variants:

METRAwin® 90-2	**Calibration Software for the GOSSEN METRAWATT Process Calibrators METRACAL MC, METRAHIT CAL, METRAHIT 28C, METRAHIT 28C *light* and METRA*Hit* 18C.**

These calibrators are used primarily for testing and calibrating electrical measuring instruments and equipment in the field of process measuring and control technology. They include the following functions: DC voltage simulator, DC current source and sink, as well as simulation of resistors and temperature sensors (thermocouples and RTDs). METRACAL MC and METRAHIT 28C are also equipped with a TRMS multimeter (V, mA, Ω, F, Hz, °C/°F). Thanks to inclusion of these multimeter functions, or by incorporating a separate precision multimeter with infrared interface (METRA*Hit* 18S, 28S, 29S, 30M or METRAHIT X-TRA, EXTRA, ENERGY) into the calibration system, automated calibration of isolation amplifiers, temperature transmitters and the like can be performed.

The software executes interactive **(DIRECT mode)** or sequence-controlled **(TEST mode)** setup of the calibrator from the PC via an RS232 interface (using interface adapters BD232 or SI232-II) or via an USB interface (using interface adapters USB-HIT or USB-XTRA), automatic analysis of measured values entered manually or read in from the multimeter via the interface, and documentation and archiving of calibration results in a calibration report.

Calibration procedures for each respective calibration object can simply be generated and tested with the program. With METRA*Hit* 18C and 28C procedures can also be transferred to the calibrator's memory, from which they can be executed autonomously (without PC). Measured values (V, mA) acquired by the METRAHIT 28C can be saved to memory automatically and subsequently be read out and analyzed at a PC, and inserted into a calibration report.

METRAwin® 90-F	**Calibration Software for FLUKE D9100, 5100B, 5500A, 5520A and 5700A Multifunction Calibrators**

The above mentioned calibrators are used primarily for the calibration of indicating measuring instruments such as multimeters, chart recorders, clip-on ammeters, panel-mount measuring instruments etc., and include the various electrical quantities required to this end. By incorporating a separate precision multimeter with infrared interface (METRA*Hit* 18S, 28S, 29S, 30M or METRAHIT X-TRA, EXTRA, ENERGY) into the calibration system, automated calibration of isolation amplifiers, measuring transducers, transmitters and the like can be performed.

The software executes interactive **(DIRECT mode)** or sequence-controlled **(TEST mode)** setup of the calibrator from the PC via an IEEE488 interface, automatic analysis of measured values entered manually or read in from the multimeter via an RS232 interface, and documentation and archiving of calibration results in a calibration report.

The program calculates the Test Uncertainty Ratio (TUR) for each calibration point based upon the calibrators' accuracy specifications which are integrated into the software, or Total Measurement Uncertainty in accordance with directive DKD-3 (WECC 19-1990).

A calibration procedure for the respective calibration object can easily be generated and tested. Tested calibration procedures for numerous multimeters from our current and previous product spectrum are included with the software.

METRAwin® 90-FJ   **Calibration and Adjustment Software for FLUKE D9100, 5100B, 5500A, 5520A and 5700A Multifunction Calibrators**

Above and beyond this, METRA HIT 22-29S/M handheld multimeters can be automatically adjusted via their infrared interface with the METRAwin®90-FJ version (suitable calibrators: 5500A and 5520A). Type and function-specific adjusting procedures required to this end are included with the software.

1.2   Common Features

- Convenient, interactive control of the calibrator from the PC with direct data entry as individual value
- Uncomplicated, fast generation, testing and execution of calibration procedures
- Simple operation: even semiskilled workers can execute qualified calibration tasks
- Display of procedural instructions which have been generated automatically or defined by the user before execution of the respective procedure step
- With interconnected multimeter: display and continuous refreshing of the measured value read in via the interface
- Outstanding flexibility with calibration signal tracking (for analogue meters, chart recorders etc.) by entering a displayed measured value with the keyboard, or by querying the measured value from the multimeter via the interface
- ISO-9000 compliant calibration documentation as a standardized or user-configured report with all necessary entries regarding the calibration object and the calibration system, as well as a tabular list of calibration values and associated evaluations for each calibration point
- Dynamic data transfer to report templates created by the user with Microsoft® Excel™ or Microsoft® Word™ (e.g. with company logo)
- Secure archiving of procedures to a data storage medium

1.3   System Requirements

Hardware Requirements   METRAwin®90 can be run on PCs which fulfill the following minimum requirements:

- 200 MHz Pentium processor
- 256 MB RAM
- Hard disk with at least 40 MB available memory
- SVGA monitor with a resolution of at least 800 x 600 pixels
- CD-ROM drive
- Microsoft compatible mouse or other pointing device

For control of the Process Calibrators METRAHit 18C, 28C or 28C light and reading in measured values from METRAHIT 2X multimeters with METRAwin®90-2:

- At least 1 free RS232 serial port for connecting 1 to 3 BD232 interface adapters or memory adapters SI232-II
- or USB port(s) for connecting 1 to 3 USB-HIT interface adapter(s)

For control of the Process Calibrators METRAHit CAL or METRACAL MC and reading in measured values from METRAHIT Starline series multimeters with METRAwin®90-2:

- USB port(s) for connecting 1 to 3 USB-XTRA interface adapter(s)

For control of the FLUKE Multifunction Calibrators with METRAwin®90-F/-FJ:

- 1 installed or external GPIB controller interface (IEEE488) with National Instruments™ compatible protocol and installed Windows drivers
  e.g. National Instruments PCI-GPIB NI-488.2
  e.g. National Instruments GPIB-USB-B NI-488.2

For printing calibration reports:

- Local or network printer which is supported by Windows

Operating System   METRAwin®90 can be run under Microsoft® Windows XP, Vista, 7, 8 (32/64 bit).

Other required Software   **For registration of the software:**

- Microsoft® Word 97 / 2000 / 2003 / 2007 / 2010
  or a similar text processing program to automatically generate a fax form in RTF format (Rich Text Format)
- Or Microsoft® Outlook or another email program to automatically generate an e-mail containing the registration data.

For creating custom calibration protocols with a company logo and / or amended protocol structure:

- Microsoft® Word 97 / 2000 / 2003 / 2007 / 2010
- or Microsoft® Excel 97 / 2000 / 2003 / 2007 / 2010

To view / print the Help documents in PDF format:

- Adobe® Acrobat™ Reader; free download from www.adobe.com/acrobat

2 Installing, Registering and Uninstalling the Program

2.1 Installation

A SETUP.EXE file is included on the CD-ROM. The program is installed with the help of several dialog boxes when this file is executed. The program directory and the name of the start menu group can be freely selected as desired.

> **i**
>
> *Note*
>
> METRAwin®90 software is available in several variants for different calibrators. The different software variants can be installed to the same directory, as long as only the last digit of the respective version numbers varies from each other (e.g. 4.04 and 4.01). However, the version with the highest number must be installed last. The version number is specified on the program CDROM. It is also displayed when program installation is initialized or when the installed program is started and can be displayed via menu **Help : About** as well.

2.2 Registration

For testing purposes, the software can be used for 30 days without a license key. To use the software fully after this trial period, a license has to be purchased and the software must be registered at the Licensor and permanently activated by entering the submitted license key.

The password depends on the entered company name and the calibrator model. Thus the registration has to be performed for each device type.

Menu Setup :   Opens the dialog box for entering the registration data:

Register

► Enter your address in the appropriate fields. Pay particular attention to the correct spelling of the *Company* name as the registration code generated is derived therefrom.

► Enter the *CD Serial* number indicated on the supplied program CD. If you have received the software as a download or by e-mail and do not have a CD serial number, you must attach a proof of purchase (invoice or receipt as a PDF or image file).

The license key request can be made by fax or e-mail.

► Click on the button **[Create fax]** or **[Create e-mail]**.

► Select in the appearing dialog window the device type(s) for which the software is to be registered, and press **[OK]**. The choice depends on the purchased software variant.

► Send the fax form that opens or e-mail to the specified address

⇒ In answer by return you get the license code (password) with which the program for the specified device type(s) can be permanently unlocked.

► To do this, open the Register dialog box again, enter the license code sent in the *Password* input box, and then click the button **[Register]**.

⇒ The program is now permanently enabled. This can be checked in the field **Registration info**. In the title bar of the program window your company name will be displayed after a reboot.

i	*Note 1*
	One license of this software allows registration for only one company but an unlimited number of installations (Company Site License). Detailed information about licensing is given in the menu item **Help: View License Agreement**.

| i	*Note 2*
	Preserve a copy of the returned registration email / fax including the password for the occasion of a re-installation becoming necessary!

2.3   Uninstall

If you want to uninstall the program again, you have the opportunity to do so under **Start : Program Files : Gossen-Metrawatt : METRAwin 90 : Uninstall**.

3   Calibration System Setup and Start-Up

3.1   Calibration System with METRAwin®90-2 and Process Calibrator METRAHIT CAL /METRACAL MC

The figures below show the possible structure variants of a calibration system using the Process Calibrator METRAHIT CAL or Process Calibrator & Multimeter METRACAL MC and the combined adapter and meter types.
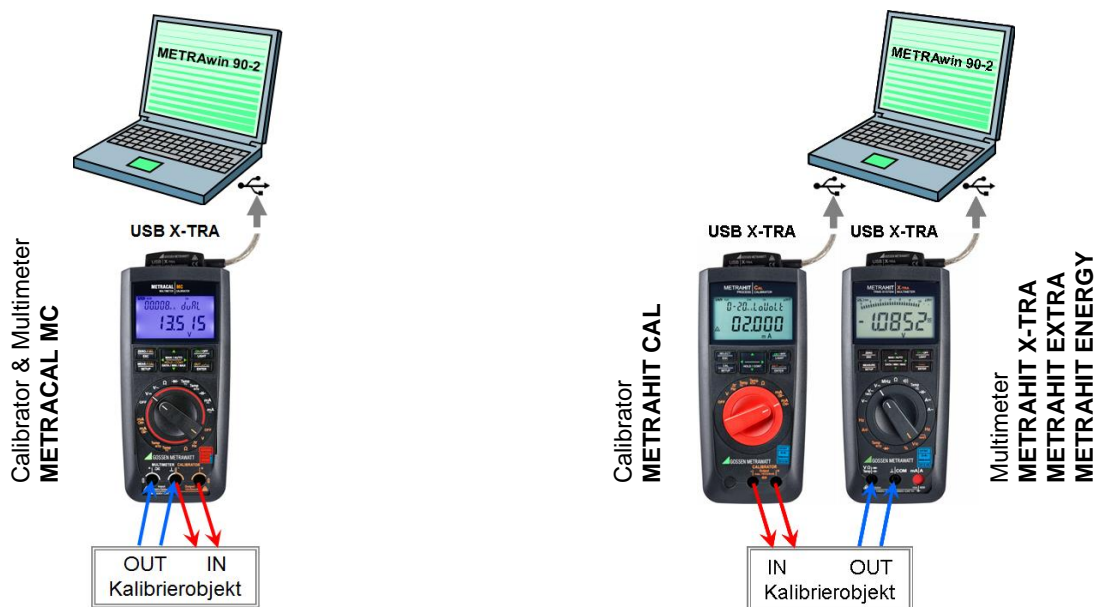
► Each Calibrator and Multimeter is connected via adapter USB X-TRA with a USB port of the PC. Before you connect the adapter to the PC, the driver "GMC Driver Control" must be installed (available on CD or download from website http://www.gossenmetrawatt.com/english/produkte/drivercontrol.htm)

i	*Note*
	Note that the driver installation may need administrator rights!
	By driver installation an individual virtual COM port is assigned to each adapter. In the Device Manager of Windows, you can verify the success of the installation and identify the assigned COM port number:
	Start : Settings : Control Panel: System : Hardware : Device Manager

Plug the Adapter to the Calibrator/Multimeter	► Insert the studs on the adapter into the slots at the top of the calibrator/ multimeter so that the cable points to the right as seen from the front of the device, and the socket for the power pack is not obstructed. Communication via the interface is only possible with the adapter in this position.
	The adapter can also be connected when the multimeter is in its protective rubber cover.

Connecting the Adapter to the PC

► Insert the adapter's USB plug into a free USB port at the PC.

⇒ Since the device driver for the adapter has already been installed, this will be loaded by the Windows operating system and a virtual COM port is assigned to the adapter.

► Start the program METRAwin 90: **Start : Program Files : Gossen-Metrawatt : METRAwin 90 : Kalib** and in the menu **Setup : Device Type** select **METRAHit Cal/Multical**.

► Select **Setup : Port Setup** to open the corresponding dialog box:
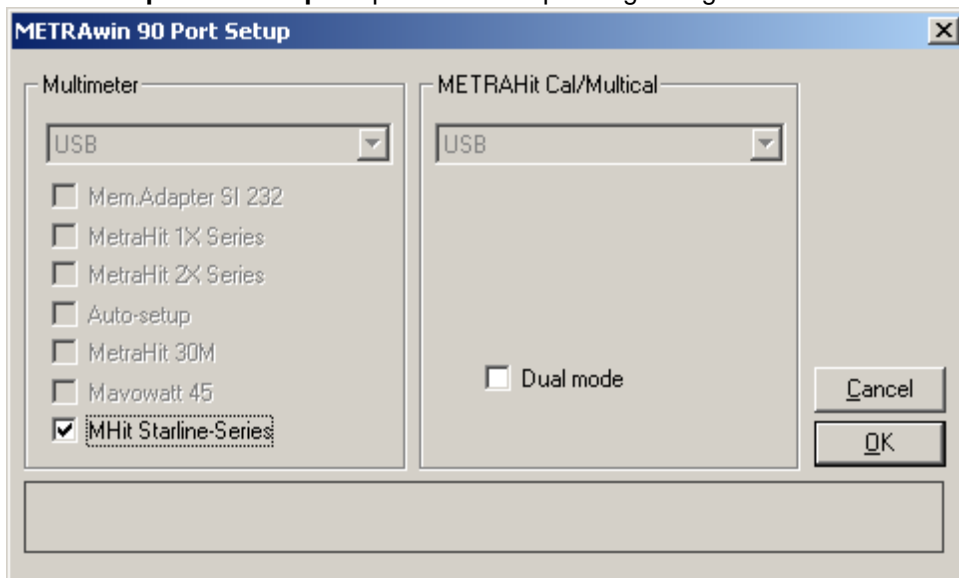
► For the Calibrator (and the Multimeter if given) select the port(s) on which the system is connected to the PC.

► Specify the multimeter model and adapter being connected by checking the corresponding box(es).

i	**Notes**
	When you place the mouse pointer on the check boxes, "tooltips" with detail information will be displayed.
	After marking the check boxes, setting instructions for the corresponding device appear in the Info field of the dialog box.

► Confirm the selected settings with **[OK]**.

⇒ The program now checks the communication based on these settings. If this test failed, the dialog window opens again, so that you can verify the configuration and correct the settings. If the test is successful, then the calibration system is now ready for operation.

3.2 Calibration System with METRAwin®90-2 and Process Calibrator METRAHIT 28C / 28C *light*

The figures below show the possible structure variants of a calibration system using the Process Calibrator METRAHIT 28C *light* or Process Calibrator & Multimeter METRAHIT 28C and the combined adapter and meter types.
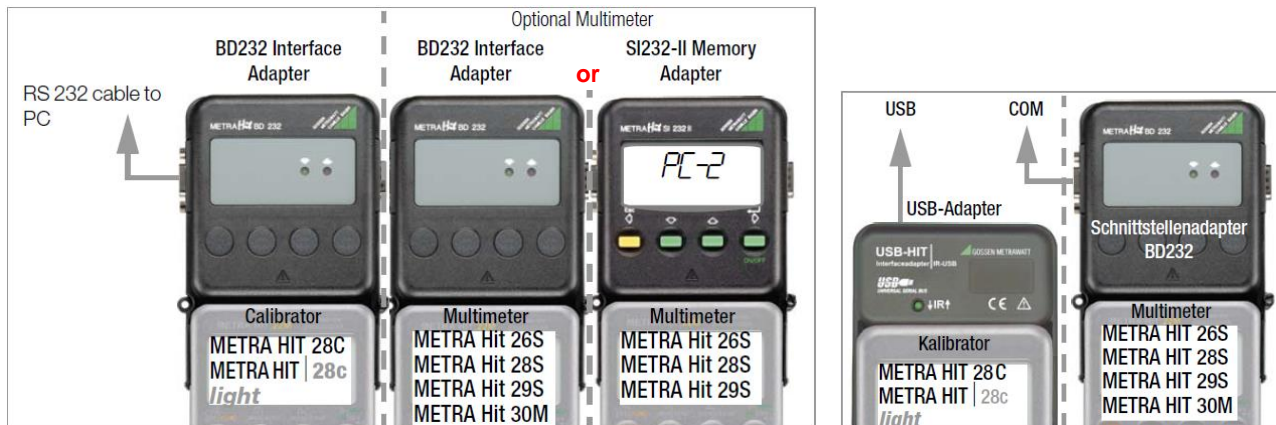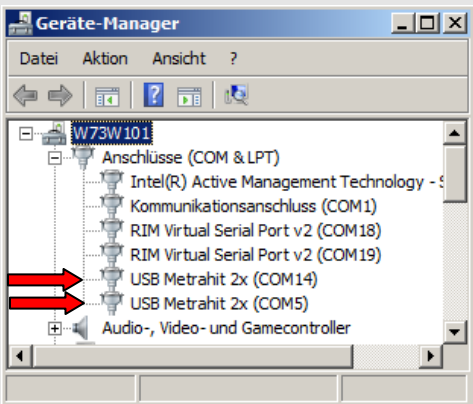

► Mount the devices as shown in the illustration and secure the mechanical connections (adapter, cable) using the fixing screws. Connect the calibrator METRAHIT 28C/METRAHIT 28C *light* via an interface adapter BD232 and a RS232 cable to a free COM port of the PC. The device address being set on the calibrator must not be 00, but is otherwise irrelevant.

► An additional METRAHit multimeter of the specified type can be optionally integrated into the calibration system with an additional BD232 or SI232-II adapter. If $Addr\ 1$ is assigned to this multimeter as well as the SI232-II adapter, it is used for acquiring measured values at the device under test instead of at the multimeter integrated into the METRAHIT 28C. If $Addr\ 2$ is assigned to this multimeter as well as the SI232-II adapter, it is used as an additional reference multimeter by the program's TEST function for the measurement of calibration signals, which are not generated by the calibrator.

► Alternatively, the calibrator and/or multimeter can be connected to a USB port at the PC via a USB-Hit adapter. <u>Before</u> you connect the adapter to the PC, the driver "GMC Driver Control" must be installed (available on CD or download from website http://www.gossenmetrawatt.com/english/produkte/drivercontrol.htm).

i	**Note**
	Note that the driver installation may need administrator rights!

By driver installation an individual virtual COM port is assigned to each adapter. In the Device Manager of Windows, you can verify the success of the installation and identify the assigned COM port number:
Start : Settings : Control Panel: System : Hardware : Device Manager

This also appears in the port selector fields of the **Port Setup** dialog box.

► Enter the following settings to the devices (refer to the operating instructions for the respective devices for details concerning device operation):

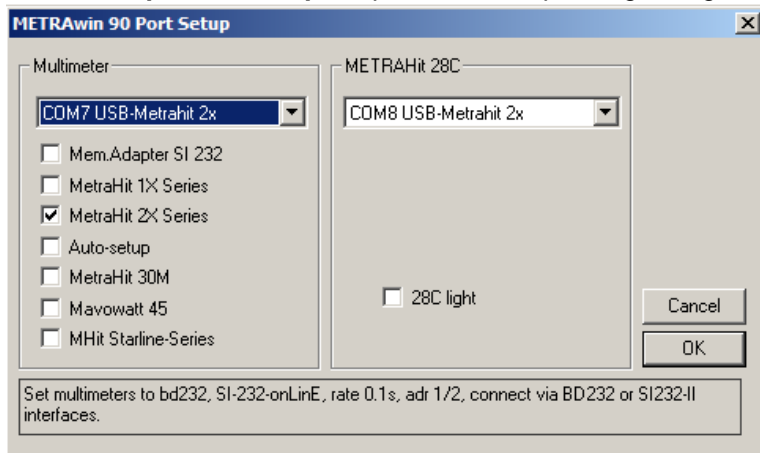| Calibrator 28C/28C *light*	► Device address ≠ 00.
	⇒ The devices are switched on automatically by the program via their infrared interfaces. After the device has received a setting command, the display shows "REM" (REMOTE operation). But it can still be operated manually.

Multimeter 2XS	► Switch the device on as usual with the **ON** key or by pressing **FUNC & ON** simultaneously, if automatic shut-off (battery saving function) shall be disabled => The symbol ⚠ appears in the display.
	► Enter the following parameter configurations to the *SEt* menu: > for use as calibration multimeter: *Addr 01* > *bd 232* > *NodEN no* > for use as reference multimeter: *Addr 02* > *bd 232* > *NodEN no*
	► Return to measuring mode by pressing the **Esc** key.
	⇒ The multimeter will also be switched on automatically by the program via the infrared interfaces.
Memory Adapter	► Switch the adapter on with the **ON** key.
	⇒ The memory adapter will also be switched on automatically as soon as it is addressed at its RS232 interface by the program.
	► Enter the following parameter configurations to the *SEt* menu: SI232-II: > *bd-in 9600* > *bd-ou 9600* > *Addr 1* > (*2* at optional reference multimeter) > *NodEN no*
	► Do <u>not</u> activate the Send mode!
	⇒ The adapter will be set to PC mode by the program; the display shows *PC- 1* or *PC-2* .

► Start the program METRAwin 90: **Start : Program Files : Gossen-Metrawatt : METRAwin 90 : Kalib** and in the menu **Setup : Device Type** select **METRAHit 28C**.

► Select **Setup : Port Setup** to open the corresponding dialog box:

► For the Calibrator (and the Multimeter if given) select the port(s) on which the respective device is connected to the PC.

► Specify the multimeter model and adapter being connected by checking the corresponding box(es).

|	
i	***Notes*** When you place the mouse pointer on the check boxes, "tooltips" with detail information will be displayed. After marking the check boxes, setting instructions for the corresponding device appear in the Info field of the dialog box.

► Confirm the selected settings with **[OK]**.

⇒ The program now checks the communication based on these settings. If this test failed, the dialog window opens again, so that you can verify the configuration and correct the settings. If the test is successful, then the calibration system is now ready for operation.

3.3   Calibration System with METRAwin®90-2 and Process Calibrator METRA*Hit* 18C

The figure below shows the structure of a calibration system using the Process Calibrator METRA*Hit* 18C and the combined adapter and multimeter types.

If only one meter is used in the system, this can also be coupled with a BD232. But then the connection of the system on the PC must be made at a real COM port as USB-to-Serial converters do not support the baud rate of 8192 baud being used in this case.
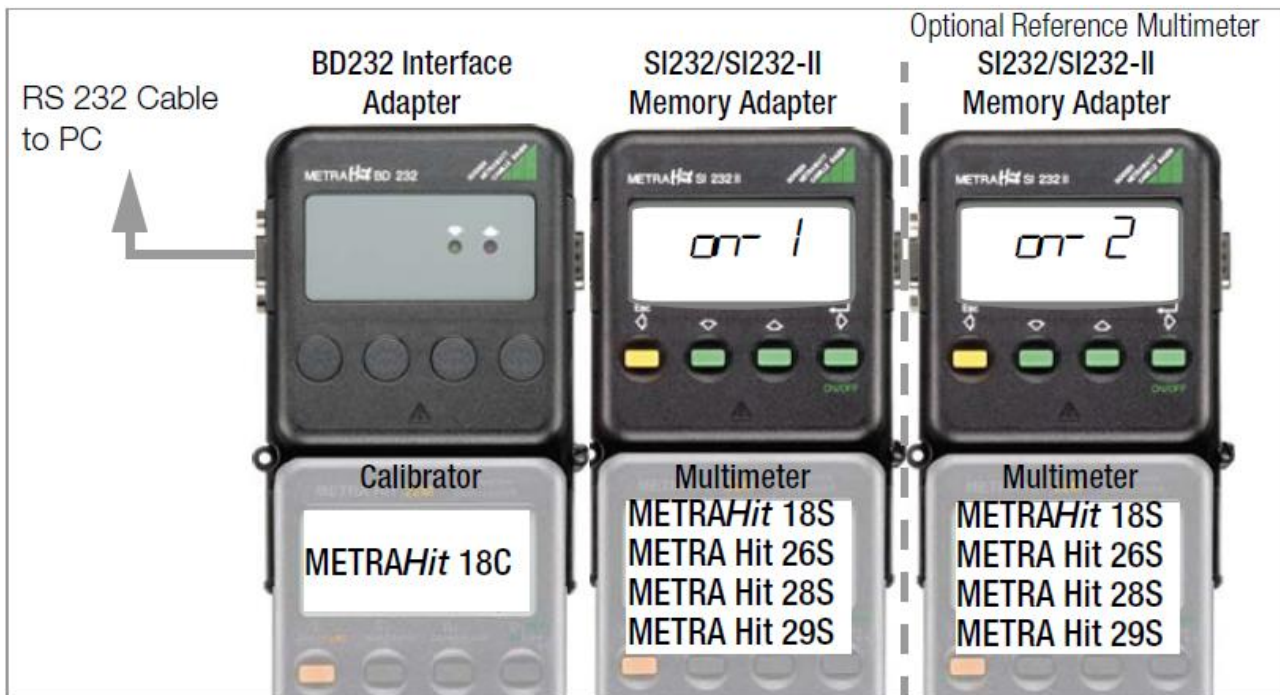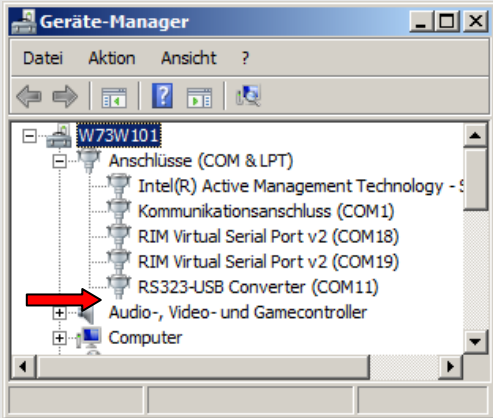

► Mount the devices as shown in the illustration and secure the mechanical connections (adapter, cable) using the fixing screws. The connection of a second multimeter with Memory Adapter as a reference multimeter for the measurement of calibration signals, which are not generated by the calibrator (in the TEST program function) is optional.

> **i**
>
> ### Note
>
> If the PC does not have a real COM port, the system can also be connected to a USB port using a USB-to-Serial converter. However, not all converters available on the market have the necessary control signal pins and current capacity to supply the Interface/Memory Adapter. We therefore recommend to use our RS232-USB Converter Z501L.
>
>
>
> For these converters a driver has to be installed. By driver installation an individual virtual COM port is assigned to each adapter. In the Device Manager of Windows, you can verify the success of the installation and identify the assigned COM port number: **Start : Settings : Control Panel: System : Hardware : Device Manager.**
>
> This also appears in the port selector fields of the **Port Setup** dialog box.

► Enter the following settings to the devices (refer to the operating instructions for the respective devices for details concerning device operation):

Calibrator 18C

► Simultaneously press the ⇧ and **ON** keys when switching the device on.

⇒ "REMOTE" appears at the display (remote control).

Multimeter 18S

► Simultaneously press the **DATA** and **ON** keys when switching the device on.

⇒ The ⚠ symbol blinks at the display (transmission mode on).

Multimeter 2XS

► Switch the device on as usual with the **ON** key.

► Enter the following parameter configurations to the *SEt* menu:
> *rAtE 0.1*
> *Addr 01* > *SI232 onLinE* > *NodEN no*

► Now activate transmission mode operation via the menu *SEnd on*

⇒ The ⚠ symbol blinks at the display (transmission mode on).

Memory Adapter

► Switch the device on as usual with the **ON** key.

► Enter the following parameter configurations to the *SEt* menu:
SI232: > *bAud 9600* > *Addr 01* > (at optional reference multimeter: *02*)
SI232-II: > *bd-in 8192* > *bd-ou 9600* > *Addr 1* > (at optional reference multimeter: *02*) > *NodEN no*

► Activate transmission mode operation via the menu *onLinE*

⇒ *on-1* appears at the display and "DATA" blinks.

► Start the program METRAwin 90: **Start : Program Files : Gossen-Metrawatt : METRAwin 90 : Kalib** and in the menu **Setup : Device Type** select **METRAHit 18C**.

► Select **Setup : Port Setup** to open the corresponding dialog box:
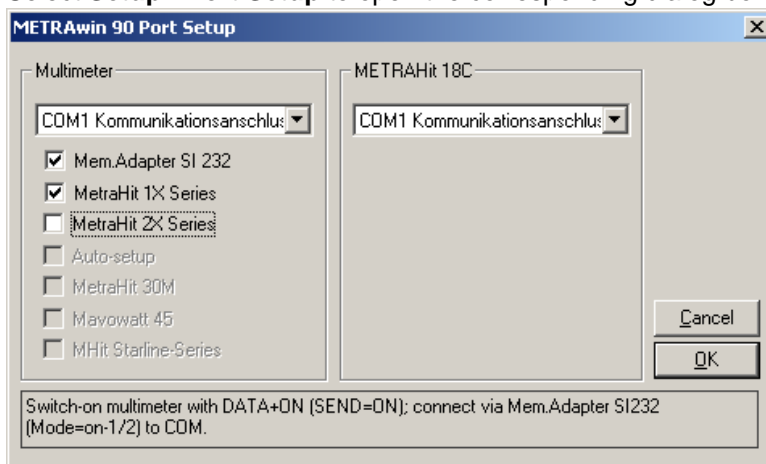
► For Calibrator and the Multimeter select the port on which the respective device is connected to the PC.

► Specify the multimeter model and adapter being connected by checking the corresponding box(es).

i	**Notes**
	When you place the mouse pointer on the check boxes, "tooltips" with detail information will be displayed.
	After marking the check boxes, setting instructions for the corresponding device appear in the Info field of the dialog box.

► Confirm the selected settings with **[OK]**.

⇒ The program now checks the communication based on these settings. If this test failed, the dialog window opens again, so that you can verify the configuration and correct the settings. If the test is successful, then the calibration system is now ready for operation.

► In the DIRECT mode, you can now check the integrity of the calibration system.

3.4   Calibration/Adjustment System with METRAwin®90-F/-FJ and Multifunction Calibrator FLUKE D9100, 5100B, 5500A, 5520A, 5700A

The figure below shows the basic structure of an automated calibration and adjustment system using a Multifunction Calibrator FLUKE 5500A/5520A for signal source and a METRAHIT 10 series or 20 series multimeter as object to be calibrated/adjusted:
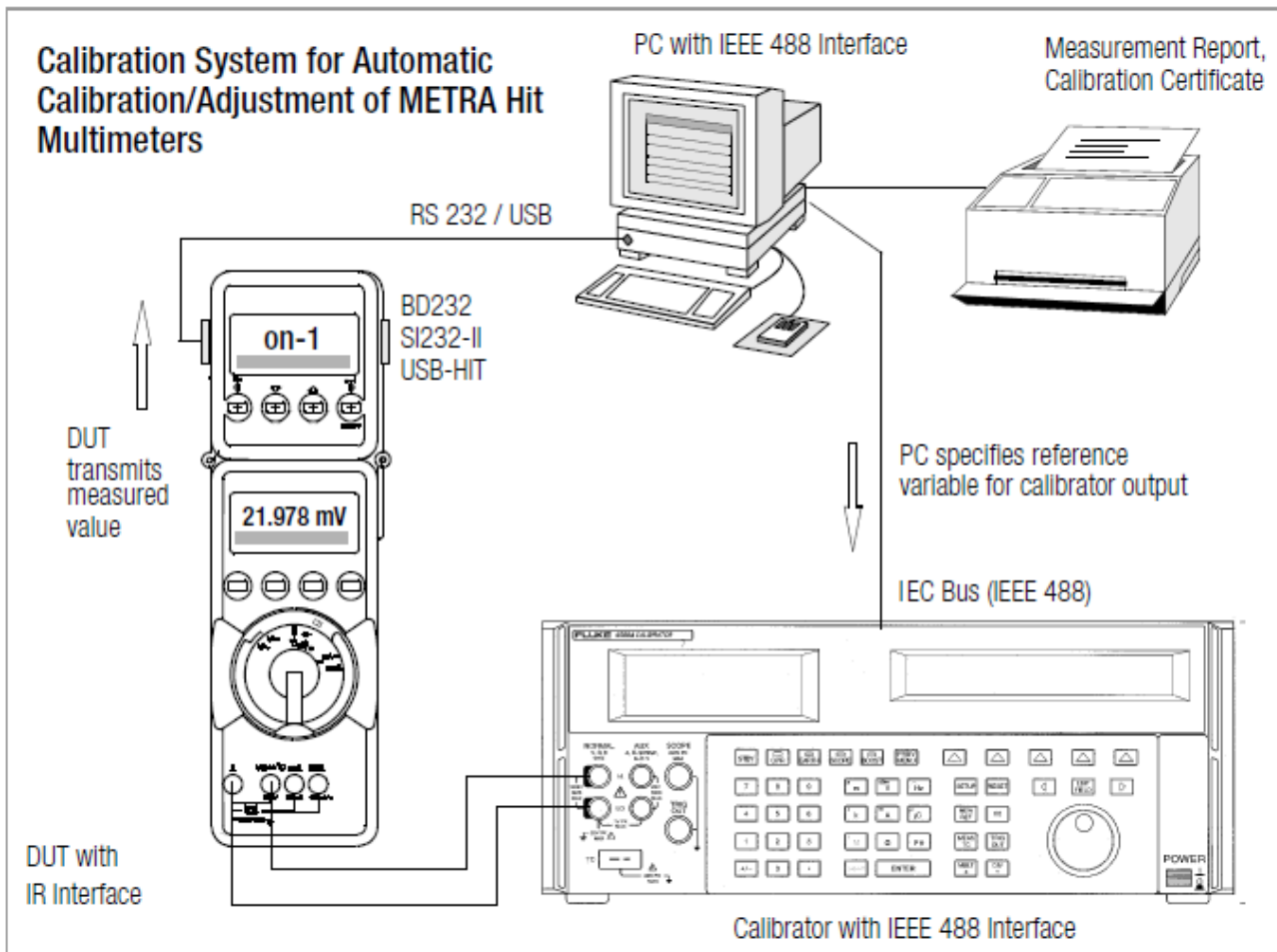

► Connect your multifunction calibrator to the PC via the IEEE 488 interface and switch both devices on. The IEEE 488 interface and its respective driver must already be properly installed and functional.

► If the system will be used for automatic calibration/adjustment of METRAHIT multimeters, the multimeter must be connected to a free COM port at the PC via a BD232 or SI232-II adapter. For METRAHIT 20 series multimeters also a USB-HIT adapter can be used for connection to a vacant USB port at the PC. For this adapter the driver „GMC Driver Control" must be installed before connecting it to the PC (available on the CD or website http://www.gossenmetrawatt.com/english/produkte/drivercontrol.htm).
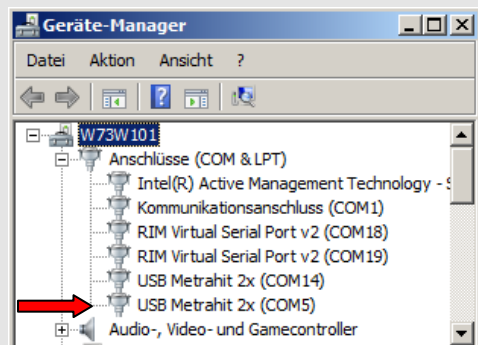
i

Note

Note that the driver installation may need administrator rights!

By driver installation an individual virtual COM port is assigned to each adapter. In the Device Manager of Windows, you can verify the success of the installation and identify the assigned COM port number:
Start : Settings : Control Panel: System : Hardware : Device Manager

This also appears in the port selector fields of the **Port Setup** dialog box.

► Enter the following settings to the devices (refer to the operating instructions for the respective devices for details concerning device operation):
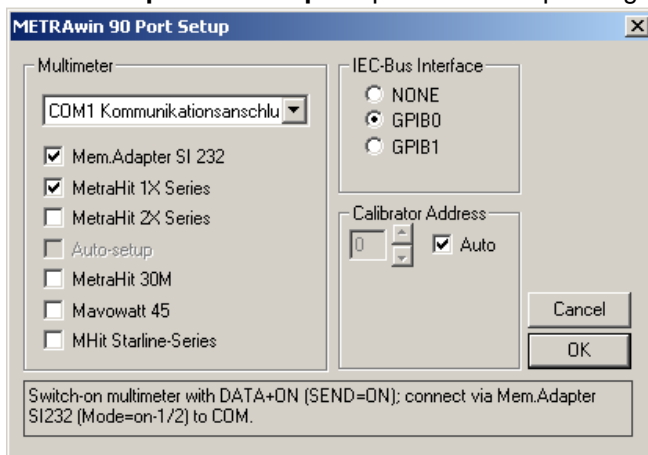
Multimeter 1XS

► Simultaneously press the **DATA** and **ON** keys when switching the device on.

⇒ The ◬ symbol blinks at the display (transmission mode on).

Multimeter 2XS

► Switch the device on as usual with the **ON** key or by pressing **FUNC & ON** simultaneously, if automatic shut-off (battery saving function) shall be disabled

⇒ The symbol ◬ appears in the display.

► Enter the following parameter configurations to the *SEt* menu:
  Addr   0 1 > *bd 232   > NodEN   no*

► Return to measuring mode by pressing the **Esc** key.

⇒ The multimeter will also be switched on automatically by the program via the infrared interfaces.

Memory Adapter

► Switch the device on as usual with the **ON** key.

► Enter the following parameter configurations to the *SEt* menu:
  SI232: > *bAud   9600* > *Addr   0 1* > (at optional reference multimeter: *02*)
  SI232-II: > *bd-in   8 192* > *bd-ou   9600* > *Addr   1* > *NodEN   no*

► Activate transmission mode operation via the menu *on li nE*

⇒ *on- 1* appears at the display and "DATA" blinks.

► Start the program METRAwin 90: **Start : Program Files : Gossen-Metrawatt : METRAwin 90 : Kalib** and in the menu **Setup : Device Type** select **FLUKE XXXXA .**

► Select **Setup : Port Setup** to open the corresponding dialog box:

► For the Calibrator select the **IEC-Bus Interface** *GPIB0* or *GPIB1* on which it is connected to the PC.

► Select the real or virtual COM port to which the multimeter is connected and specify the multimeter model and adapter being used by checking the corresponding box(es).

> **i** | **Notes**
> | When you place the mouse pointer on the check boxes, "tooltips" with detail information will be displayed.
> | After marking the check boxes, setting instructions for the corresponding device appear in the Info field of the dialog box.

► Confirm the selected settings with **[OK]**.

⇒ The program now checks the communication based on these settings. If this test failed, the dialog window opens again, so that you can verify the configuration and correct the settings. If the test is successful, then the calibration system is now ready for operation.