Operating manual

MR36
Insulation Resistance Tester
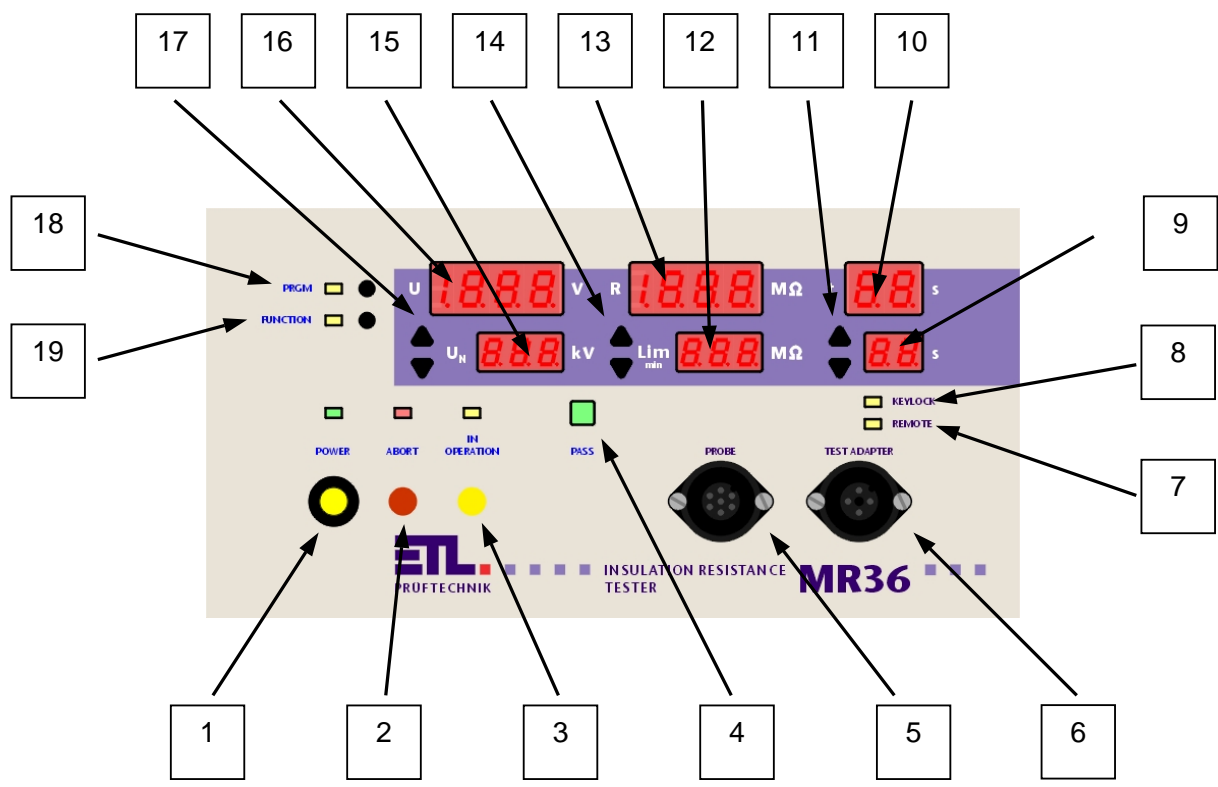
Contents

1   Mains switch
2   "ABORT" key with lamp
3   " IN OPERATION " key with lamp
4   Lamp test time over – result OK (PASS)
5   Socket for test probe
6   Socket for connecting the test object (e.g. via lead adapter)
7   Lamp "Remote control is active" (REMOTE)
8   Lamp "Keylock active" (KEYLOCK)
9   Estimated test time
10   Actual test time
11   Keys ▲ or ▼ to set the test time
12   Target value for the resistance limit value
13   Real value of the resistance
14   Keys ▲ or ▼ to set the limit value
15   Estimated value for the test voltage
16   Actual value for the test voltage
17   Keys ▲ or ▼ to set the test voltage
18   Key "Test programmes" selection
19   Reserved

Warning
This sign means that these instructions have to be taken careful note of in
order that the machine is used safely. If the instructions are ignored the
machine could be damaged or the operator injured.

Preliminary remarks:

Check that the delivery is complete. Take care to check for possible small packed parts. Check the delivery for possible damage in transit, externally visible and also externally not visible (hidden). In case of damage in transit, notify the delivery company immediately (factual statement).

1   General

The enclosed tester has been built and test according to the safety standards EN 61010-1 and left the manufacturer in perfect condition. In order to keep this condition and ensure there is no danger when the machine is used, the user must ensure that the tips and warnings both in this manual and set out in the safety standards EN 50191 (DIN VDE 0104) are taken note of.

The MR36 is built to be used indoors and is only to be used for testing the protective leads resistance of a product.

2   Technical data

Mains   230 V 50 ... 60 Hz
Power input   max. 1,5 A
Mains cable   is enclosed with delivery

Output voltage	500 Vdc
Type of current	direct current; maximum 3 mA
Volt meter, display	LED 13 mm, red
Resolution	1 V
Accuracy	1 % $\pm$ 2 digit
Ohm meter, display	LED 13 mm, red
Measurement range	1 MΩ to 1 GΩ
Resolution	100 kΩ with $R_{ISO} >$ 20 MΩ 500 kΩ with $R_{ISO} <$ 20,5 MΩ 1 MΩ with $R_{ISO} <$ 100 MΩ
Accuracy	1 % $\pm$ 2 digit
Test time display	LED 13 mm, red
Setting range	1 to 99 s, eternity
Keylock	Standard
Manual setting	Standard
Setting PC-controlled via RS 232 port	Standard
Fault indication acoustic	Standard

Fault indication optical	Standard
RS 232 port	Standard
Control port Control	Standard
Self-test	Standard
Programmable functions (upto 9 programmes)	optional, not with the basic version
Dimensions	290 x 160 x 250 mm (W x H x D)
Weight	approx. 6 kg

Fuses:

There is a fine fuse (5 x 20 mm) 2,5 A tr on the back of the MR36 in the cold machine socket.

⚠ Only use fuses of the same value as replacements!
Do not repair faulty fuses!

Environmental climate

Temperature	5 to 40 °C,
Rel. humidity	80% non-condensing
Height	max. 2,000 m above sea level

3 Tips for safe usage

The condition of the mains leads and the connection to the test object should be checked everyday before testing begins.
The machine must not be used if there is any visible damage!
Faulty parts should be replaced or taken out of use.

Only ETL-authorised workshops have permission to open and repair the machine. There are no parts inside the machine that the user can replace himself.

The MR36 belongs to protection class I.
The protective leads connection to the mains cable being used and the mains socket must be faultless. A protective lead breakage can lead to the machine being dangerous. Therefore this sort of damage is inadmissible.

4 Maintenance

Regular maintenance increases the availability and retains the safety of your test station (it is also required by EN 50191). We recommend that you keep maintenance records. Please take all maintenance work and interval recommendations from the following table.

Do not use the tester when it has obvious defects!

Maintenance	Interval	Implementation
Faultless condition of the mains cable and the connecting cables to the test object	before starting to test	Visual check
The function of error recognition	recommended daily	The faultless functioning can bechecked using a defect-example (test object with built-in error).
Calibration	recommended annually	Please get in contact with the manufacturer.
Safety instruction of the test personnel	annually	as detailed in EN 50191 (DIN VDE 0104)

Cleaning	when necessary	Disconnect from the mains to clean. Clean the equipment with a damp but not wet cloth. Ensure that no water or cleaning fluid gets into the inside of the equipment! Danger of electric shock through mains- and high voltage! Never use a scouring agent,solven or cleaning fluid which could scratch or damage the plastic surface.

Table of maintenance tips

5 Connecting the tester

5.1 Mains connection

Please use a protected contact socket 230 V, 50 Hz for the mains connection. Use the enclosed mains cable to connect the tester with the mains.

5.2 Test leads

There are two sockets on the front of the MR36 forconnecting the test leads. The socket "PROBE" (5) is to connect a test probe with a start button (e.g. VPS36MRC). The socket "TEST ADAPTER" (6) is for connecting a lead adapter (LTA36MR), clip contacts (VPK36MR) or a second test probe (VP28).

In order to get perfect measurement results securethe plug with the screws provided.

The sockets forconnecting the test object can also be built into the back of the equipment if the customer so requires.

Do not put any foreign voltage through the equipment via the test contacts!

5.3   Ports

The ports for the CAN-Bus, RS232 and the control are on the back of the equipment. They are explained further in chapters 9 and 11.

6   Testing with the MR36

The MR36 is an insulation resistance tester that fulfils all test specifications with a test voltage of 500 Vdc.

Important tip:
If one or more keys don't show that they are functioning, check to see if the keylock is active. You can check this by looking to see if the LED (8) "KEYLOCK" is lit. If this is the case, please contact the supervisor for your test or read 12.2.3 "Removing keylock".

6.1   Turning on

Turn on the mains switch (1). The gree light "POWER" above the mains switch shows that the tester is on. If the light (2) above the red button is on then the MR36 can be turned on.

The set of test parameters which was previously set will be shown on the displays after the Firmware version. Previously selected parameters for the test programmes are not re-loaded.

6.2   Setting the test voltage

The test voltage on the MR36 can be selected using keys (17) ▲ or ▼.
The test voltage cannot be adjusted on theMR36, as this variation is only for 500Vdc.

6.3   Setting the limit values

The limit values for the resistance are set using keys (14) ▲ or ▼. The limit value can be set in the range from 1 to 1000 MΩ.

6.4   Setting the test time

The test time is shown in display (9) and is selected using keys (11) ▲ or ▼. A time between 1 and 99 seconds can be selected. If a test is required without test time, then eternity "- - " should be selected in the display.

6.5   Test programmes (optional)

The MR36 can save upto 9 test programmes. A fast switching between different sets of parameters is therefore possible.

Saving, editing and deleting the programme is explained in the Apendix in chapter 10.

6.5.1   Selecting a saved test programme

A saved test programme can be selected using key (18) "PRGM":
When you press a key the first saved programme will be called up, every further pressing of the key selects the next saved programme (e.g. Pr1 → Pr3 → Pr9).
The programme number is shown on the display 16 and the corresponding test parameters are shown on displays 9, 12 and 15.

6.5.2   Exiting a test programme

The test programme is exited when <u>one</u> test parameter (keys ▲ or ▼) is changed, the saved settings of the programme remain unchanged though.

6.6   Starting a test

There are a number of different ways for the user to start a test.
They are as follows:

-        press the test button on the test probe.

-        change from Low to High on the control entry "Control"

-        press the yellow button (3) on the front plate.

There are three start modes so that the start conditions connect logically with one another (see 12.5). When the equipment os delivered start-mode 0 is set.
A test can be started at any time, separately from the start mode using the yellow button (3).

6.7   Ending a test

As with starting a test, the end or stopping of a test is dependant on the start mode. Generally though, a test can be stopped at any time by pressing the red button (2). The reasons for ending or stopping a test are as follows:
-        when the test time is finished (with test times more than 1 second)

-        through pressing the red button "ABORT"

-        through releasing the start button on the start probe

-        through changing from High to Low on the control entry "Control"

6.8   Procedure for a test with test time

-        Set the test parameters as explained above or select a test programme. The test time must be greater than 1 second.
-        Make contact with the test object (e.g. with a lead adapter and test probe).

-        Start the test (e.g. with the start button on the test probe).

-        The current test voltage will be shown on display 16.
         The resistance value of the test object is shown in display 13.
         The lapsed test time is shown on display 10.

-        When the test time is over there is a short acoustic signal, after which the test button can be released and the measurement value display 13 will show the minimum value measured.

6.9   Procedure for a test without test time

-        Setting and procedure as in 6.8, the test time must be eternity "- -" though.

-        Make contact with the test object.

-        Start test

     -        Display 16 shows the present test voltage.
     -        The insulation value of the test objectis shown in display 13.
              In the display for the test time (10) "- -" is shown.

-        The test person or an external control (see 6.7) decides when the test isfinished and the measurement value display 13 will show the minimum value measured.

6.10   Results and fault indication after a test

6.10.1 Test OK "PASS"

If the minimum measured resistance is above the limit value the results display will show "PASS" (4) .

<u>6.10.2 Test not OK "FAIL"</u>

-       Limit value error:
  If the resistance is below the pre-set limit value then the measurement value display (13) will flash.
  If the measured value is above the measurement range of the equipment, then a "1" (Overload) will flash in display 14.
  If the measured value is below the measurement range of the equipment, then a "0" will falsh in display 14.
-       Time error:
  If the test is stopped before the test time runs out (see Ending a test 6.7), then the actual time display (10) will flash.
-       Voltage error:
  If the test voltage was below the pre-set value during the test, then the actual voltage display (16) will flash.

If the test results are not OK "FAIL" then the error reason will always be shown flashing in the display and the internal beep will be heard for approximately one second.

Tip:
The receipting of and deleting of error messages is possible using button (2) (without turning on the test voltage) or with button (3) (with turning on the test voltage again).

7.   Keylock

In order to stop any changes being made by accident, the system supervisor can lock the enter key either partly or completely. To remove the lock see Appendix 12.2.3 or ask your system supervisor, please.

8.   Guarantee and customer service

The MR36 is guaranteed for 12 months from delivery date. Parts that can be proved as being made from defect materials or are made useless through faulty production will be repaired or replaced free of charge during the guarantee period. Returning the equipment to us, or a named customer representative is also free of charge in this 12 month period.
Avoid doing repairs yourself as this makes the guarantee invalid.

Our customer service personnel are still available to give advice at any time even when the guarantee period has expired. This way you can ensure you always have faultless testing equipment.

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Appendix: Tips for system supervisor

The necessary functions for the daily usage are explained in the previous paragraphs. Furthermore, the MR36 has further functions, which are generally only needed when setting up a test station. This part is therefore, for the person who sets up and supervises the test stations.

9.   Socket "Control"

The MR36 can be controlled using an external control. To do this there is the socket "Control" on the back of the equipment, which is a 9-pole Sub-D-plug. There are 3 exit signals and 1 entry signal through this socket:

9.1   Starting the test cycle using "Control-Start"

9.1.1   Controlling with an external control voltage

MR36
Vcc   4

IN+   5

IN-   9

GND   8

LOW = 0V … 1,5V
HIGH = 3V … 24V

Connect an external voltage + 5 ... 24 Vdc an pin 5 (+) and pin 9 (-). The input current is max. 30 mA.

When there is enough (> 3 V to max. 24 V) control voltage flowing it is equivalent of a start signal.
Below a control voltage of 1,5 V is the equivalent of a stop signal.
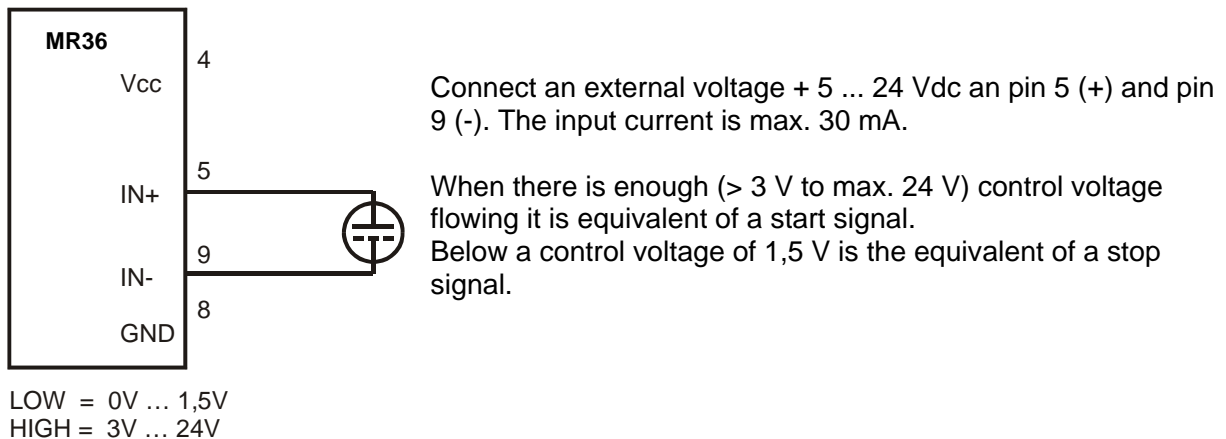
9.1.2   Controlling with an external potential free relay contact

MR36
Vcc   4

IN+   5

IN-   9

GND   8

External potential free relay contact between pin 4 and pin 5
Contact capacity 5 V, min. 20 mA

Bridge pin 8 to pin 9 necessary
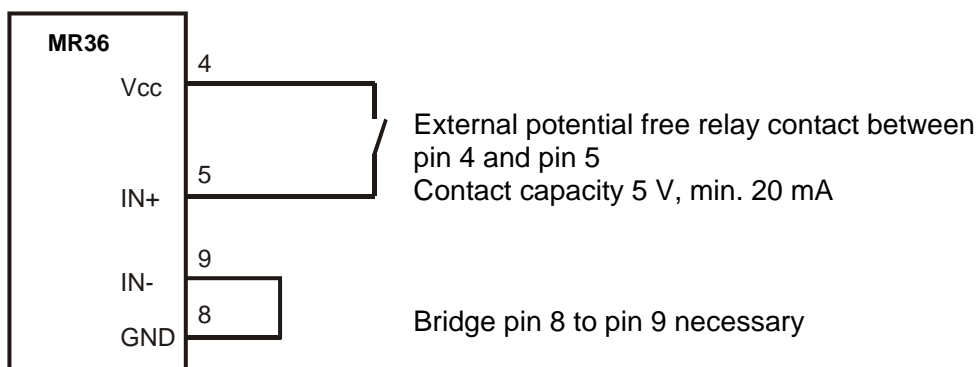
The starting of a test is only possible when the start requirements of each of the start modes (see 12.5) are fulfilled.

9.2 Result output

The exit signal is through potential free contacts with reed relays. The maximum input voltage is 24 V with a maximum current of 100 mA.

```
  MR36
         PASS  |2                        Signal "PASS"
                                         (Test OK)

         FAIL  |7                        Signal "FAIL"
                                         (Test not OK)

          OP   |1                        Signal "OP"
                                         (Test is active)

         COM   |6    +24V

  I_max = 100mA                    Interface relays or input for a
  U_max = 24V                                    PLC
```
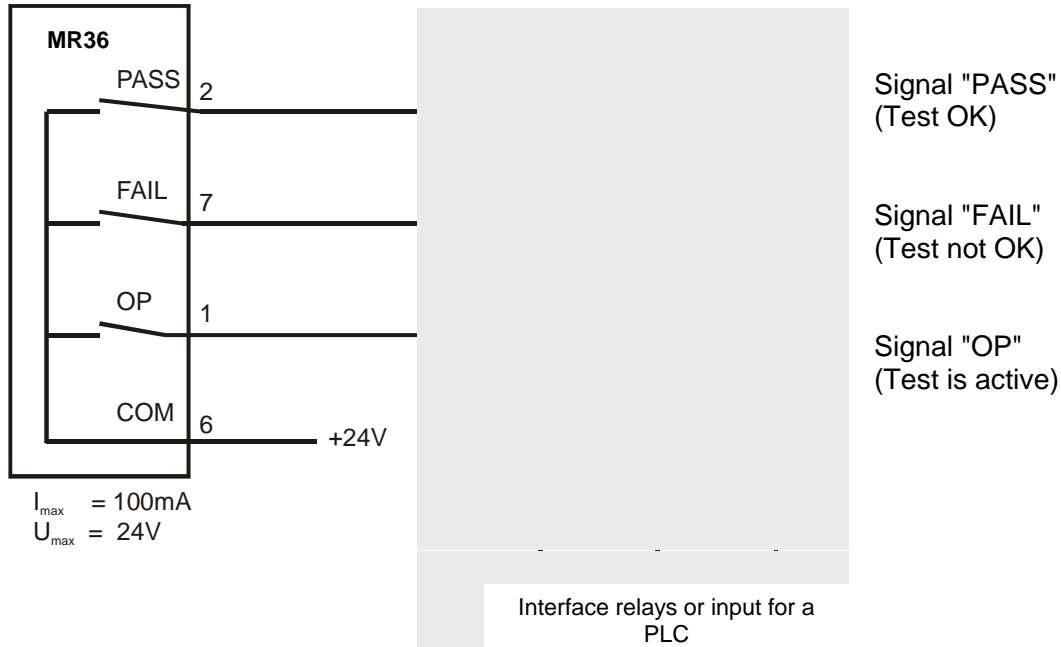
Exit "PASS":
When the test time is over the exit is active (contact closed), when there is no error during the test (→ analog to signal lamp 4).

Exit "FAIL":
When the test time is over the exit is active (contact clsoed), when there is at least one error during the test (e.g. limit value, time or current error).

Exit "OP":
The exit is active (contact closed) when the test voltage is turned on (→ analog to signal lamp 3).

If the measurement is started without a test time the exits "PASS" and "FAIL" – dependant on the measurement values – are active from the start of the test.

The signal exits are re-set by pressing the red button (2).

10   Programming-mode (optional)

Tip:
If no button is pressed for approx. 8 seconds while in programming mode, this mode is automatically exited and settings that have not been saved will be lost. This stops data being saved accidently.

10.1   Adding a new test programme

-    Hold down key (19) "PRGM" for approx. 3 seconds until "Pr" flashes.

-    By quickly pressing key (18) repeatedly the requiredprogramme number (Pr1 to Pr9) can be selected.

-    Set the limit value using keys (14) ▲ or ▼.
     Set the test time using keys (11) ▲ or ▼.

-    To save the programme (see 10.3) .

10.2   Editing an existing test programme

-    Select the programme to be edited using key (18).

-    Press key (18) "PRGM" for approx. 3 seconds, if "PR?" flashes you are in programming mode.

-    To set the test parameters (see 10.1) .

-    Save the changed programme.

10.3   Saving a programme

Press key (18) "PRGM" again for approx. 3 seconds, the settings for this programme number will be saved. Display (16) will flash the letter "P" during the save process. When the save process has successfully been completed, "P" will no longer flash and the programming will be acoustically accepted.

10.4   Deleting a test programme

-       Select the programme to be deleted using "PRGM", then keep this button pressed for approx. 3 seconds.

-       Set the test voltage using key (18) ▾ to less than 500Vdc, "del" will appear on the display.

-       Keep key "PRGM" pressed for approx.3 seconds, the settings for this programme number are deleted.

Tip:
The programme numbers for further programmes remain as they were.
For example: You have test parameters saved as programme Nos. 1, 2, 3 and 4 and you delete programme No. 2, then programme Nos. 1, 3 and 4 remain the same.

11.   Series ports

11.1   RS 232 port

Apart from using the series port to connect with a protocol printer, it can also be used to connect to a normal PC. This can then receive the test data instead of a protocol printer.

This port also offers the possibility to save sets of test parameters on a PC and download them onto a MR36 if necessary.

To ensure a safe and disturbance free data transfer Keyword Protokoll 2000 (KWP 2000) is used. You can use the following drivers: LabView, Active-X-Automation, DLL as well as the complete data management system ETL-DataView which are deliverable and explained in the instructions.

11.1.1 Connecting to a protocol printer

A series protocol printer E.g. the pin printer CBM-910 with 24 digits per line, can be connected to the series port "RS 232". Test data can be recorded for each separate test using this printer.

The language that the protocol is written in can be set, more information can be found under 12.4 (Language selection for protocols).

Tip:
There is no printout for an insulation resistance test without a set test time!

11.1.2 Connecting to a PC

Plug: Sub-D   9-pole, socket
                    Rxd   pin 2
                    Txd   pin 3
                    Ground   pin 5

Protocol: Baud rate   9600
                    Parity   no
                    Data bit   8
                    Stop bit   1
                    Handshake   no

Data: ASCII

11.1.3 ETL-DataView data management system

The PC-Programme ETL-DataView allows asmany sets of test parameters to be saved as you wish, with numerous test steps and various test parameters and programming including visual tests with test instructions for the user.

As well as this, all test results are automatically recorded, using dates, times, test stations and testers. Please ask for further information.

11.1.4 RS232- connecting cable

Zero modem cable with Sub-D-plug 9-pole and Sub-D-socket 9-pole
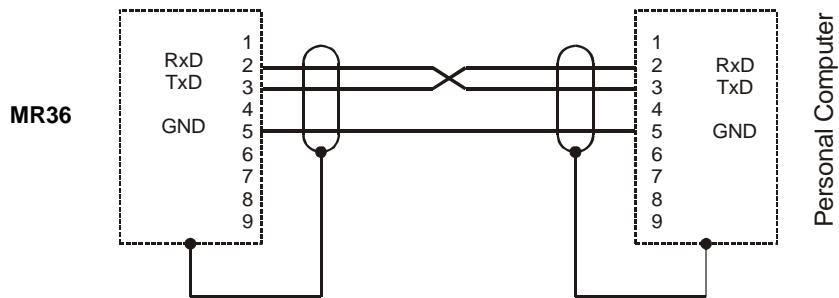
11.2   The ETL-CAN-Bus

This bus can be used when you want to control more testers in the '36 series e.g. a UH36 and an MR36 at the same time. This can either be done using the PC-Programme ETL-DataView or also in the stand-alone-mode.

The equipment (maximum 255) must be connected using a special CAN-cable. This cable is available separately with the necessary terminator resistors. It is irrelevant in which CAN-socket on the back of the tester (CAN 1 and CAN 2) that the cable or terminator is plugged into.
If a number of similar testers e.g. three MR36 connected via CAN, each piece of equipment must be given an index number.

A self-set test plan can be downloaded onto the "master" with the programme ETL-DataView. The test system is then capable of doing the test runs without being connected to a PC.
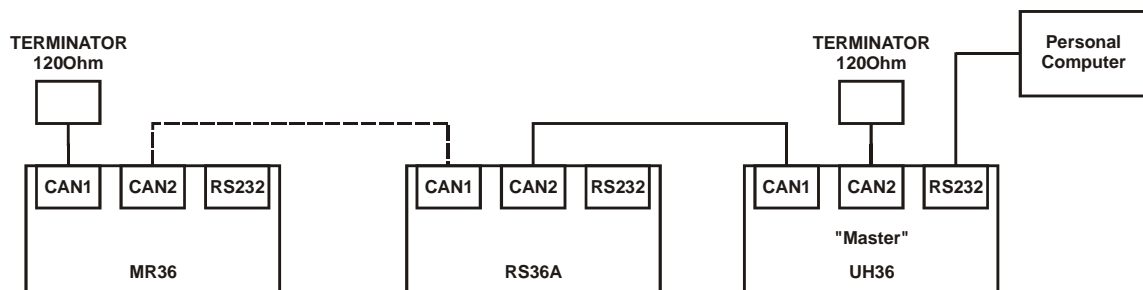
12.   System settings

Sytem settings should only be undertaken by the system supervisor and are therefore only reachable via a hidden menu.

It is up to you, who you give the information to about getting to the system menu.

12.1   Entry to system menu

This is how you get to the hidden menu for the system settings:

Turn off the mains switch (1), press both keys (11) ▲ and ▼ at the same time and keep pressed while you turn the equipment back on using button (1). Now you can release both keys (11).

With keys (17) ▲ and ▼ select the required menu:

Loc   System setting *Keylock* (see 12.2)
LEd   System setting *Brightness of displayelements* (see 12.3)
LAn   System setting *Language selection for protocols* (see 12.4)
StA   System setting *Start-mode* type of usage (see 12.5)
bu   System setting *Buzzer-mode* (see 12.6)

Tip:
If no buttons are pressed for 8 seconds then the MR36 automatically exits the menu for system settings.

12.2   Keylock – menu "Loc"

In the interest of process security it makes sense to prevent the re-setting of test parameters by accident. This is possible through specific keylocking.

12.2.1 Activating keylock

Pre-requirement: You are in the menu "System setting – Loc", see 12.1

Using keys (14) ▲ and ▼ select the required keylock code 0 to 15. Savethis setting by using key (18) "PRGM".

Important: A flashing "P" on the display (16) shows that your setting is not yet saved. Press this key for at least 3 seconds to save. As soon as the setting is saved your equipment gives an acoustic signal and "P" is shown in display (16).

Tip:
An extensive table showing the numerous possibilities can be found under 12.2.2.
When keylockis activated then the signal lamp (8) "Keylock" is lit.
Explained here are 3 examples of the most necessary keylock-codes.

Example 1:   Keylock-Code 0

Testing with only one pre-set limit value and one test time.
Changing any parameters is not possible.

Example 2:   Keylock-Code 2
Selecting pre-programmed sets of test parameters using key (18) "PRGM" is possible
(see 6.6.1 "Selected a saved test programme" and 10. "Programming mode").
Changing and saving any parameters is not possible.

Example 3:   Keylock-Code 4
The target value setting is available.
Selecting and saving test programmes is not possible.

Tip:
No keys are allowed to be locked in order that sets of parameters can be programmed (see
Chapter 10), to remove keylock see 12.2.3.

12.2.2 Keylock code table

To allow keys to be individually locked, 4 buttons or functions can be separately secured to stop
accidental access.They are:

- Function   Key 19
- Key setting estimated value   Keys 11, 14, 17
- Select test programme function   Key 18 (short hold)
- Programming function   Key 18 (long hold)

With key 14 you can select the required keylock-code. In order to do this choose the appropriate
decimal or binay value from the following table.

Tips for setting:
The keylock-code is shown as a decimal value in display 12, the corresponding binary value is
shown in displays 10 and 13.

Keylock-Codes:

Setting value		Keys or functions			
Binary	**Dez.**	**Function**	**Estimated value setting**	**Programme selection**	**Programming**
0000	0	**X**	**X**	**X**	**X**
0001	1	**X**	**X**	**X**	**active**
0010	2	**X**	**X**	**active**	**X**
0011	3	**X**	**X**	**active**	**active**
0100	4	**X**	**active**	**X**	**X**
0101	5	**X**	**active**	**X**	**active**
0110	6	**X**	**active**	**active**	**X**
0111	7	**X**	**active**	**active**	**active**
1000	8	**active**	**X**	**X**	**X**
1001	9	**active**	**X**	**X**	**active**
1010	10	**active**	**X**	**active**	**X**
1011	11	**active**	**X**	**active**	**active**
1100	12	**active**	**active**	**X**	**X**
1101	13	**active**	**active**	**X**	**active**
1110	14	**active**	**active**	**active**	**X**
1111	15	**active**	**active**	**active**	**active**

X – the specific key / function is locked
active – the specific key / function is available for the user

12.2.3 Removing keylock

Pre-requirement: You are in the menu "System setting – Loc", see 12.1

Keylock-Code 15 :   All keys / functions are available.

12.3   Brightness of display elements

Pre-requirement: You are in the menu "System setting – LEd", see 12.1

Using keys (14) ▲ and ▼ you can select the required brightness. Save these settings using key (18) "PRGM" (hold down for at least 3 seconds – until "P" nolonger flashes).

12.4 Language selection for protocolls

Pre-requirement: You are in the menu "System setting – LAn", see 12.1

Using keys (14) ▲ and ▼ you can select the required language version. Save these settings using key (18) "PRGM" (hold down for at least 3 seconds – until "P" no longer flashes).

The following languages are presently available:

0	English
1	German
2	Italian
3	Spanish
4	French
5	Dutch
6	Portugese
7	Swedish

12.5 Start - mode – menu "StA"

Various user possibilities make it necessary that the reaction of the MR36 to the button on the test probe abd the control entry (she 12.6) are adjusted to meet each user definition.

Start modes 0, 1 and 2 are presently installed, mode 0 is automatically set by the manufacturer.

⚠️ Only change the start-mode when you are sure.

12.5.1 Setting the start-mode

Pre-requirement: You are in the menu "System setting – StA" , see 12.1

Using keys (14) ▲ and ▼ you can select the required start-mode. Save these settings using key (18) "PRGM" (hold down for at least 3 seconds – until "P" no longer flashes).

12.5.2 Start-mode 0

The start of a test is wither through pressing the test button on the test probe **or** through a High-signal on "Control-Start" (see 9.1).

Tip:
The start requirement (pressing test button or "Control-Start" active) that starts a test in this mode can also stop it. If a test is started using the test button it cannot be stopped using the Low-signal on the "Control"-plug. The test finishes when either the test button is released before the test has finished, when the test time is run or when there is an error. The same applies when the start of a measurement is through "Control-Start".

12.5.3 Start-mode 1

The start of a test is only possible when the test button is pressed **and** a High-signal on the "Control-Start".

12.5.4 Start-mode 2

The test can **only** be started through the "Control-Start" (e.g. foot switch). The button on the test probe has no influence.

Tip: valid for start modes
The start requirements must remain the same during the test (High-Signal on "Control-Start" and/or test button pressed). If, for example, a foot switch is used before the test time is over it results in a time error (display 10 flashed) and the test is invalid (not OK) .

12.5.5 Table of various usages

StA-Mode	Usage	Start of the test using:	Ending the test using:
0 **(Default)**	The test object is contacted with a test probe. Test time is 2 seconds.	pressed test button	- end of test time (regular) - red button (abort) - releasing the test button before the end of test time (abort) *The control-entry cannot end the test.*
0 **(Default)**	The test object is contacted with a test probe. No test time.	High-Signal on control-entry	- red button (regular) - Low-signal on control (regular) *The test button has no influence.*
1	The test probe is contacted with a test probe. There is not test time set on the MR36. The test time is set by an external control.	pressed test button **AND** High-Signal on control-entry	- red button (abort) - releasing the test button before the end of test time (abort) - Low-signal on control (regular)
2	The test object connection is fixed, a test button is not available. Test time is 2 seconds.	High-Signal on control-entry	- end of test time (regular) - red button (abort) - Low-signal on control (regular)
2	The test object connection is fixed, a test button is not available. No test time.	High-Signal on control-entry	- red button (regular) - Low-signal on control (regular)

Sart mode table

12.6 Buzzer-mode

The MR36 has various modes, that control the internal hum.
Presently installed are the buzzer modes 0, 1 and 2, mode 1 is pre-set by the manufacturer.

12.6.1 Setting the buzzer-mode

Pre-requirement: You are in the menu "System setting – bu", see 12.1

Using keys (14) ▲ and ▼ you can select the required buzzer-mode. Save this setting using key (18) "PRGM" (hold down for at least – until "P" no longer flashes).

12.6.2 Buzzer-mode 0

The hum is de-activated (there is only a short peep when programming).

12.6.3 Buzzer-mode 1

When measuring start and ending without error "PASS" and when programming the MR36 reacts with a short peep.
The tester reacts with a long peep at the end of a measurement with an error "FAIL".

13.   Downloading software for the equipment

All testers in the 36 series have a modern processor architecture, that allows an update of the equipment software (Firmware). The testers are delivered with the most up-to-date version of the Firmware. It can be necessary through developments or special customer requirements that a new or specific Firmware is needed on the tester.

It is possible to re-new the Firmware using the integrated Flash-EPROM without the hassle of the EPROM-Swop. All that is necessary is a PC, a RS232-zero modem cable (see 11.1.4) and the ETLUpdate programme.

Install the ETLUpdate programme on a PC and complete the following steps:

- turn off the tester

- connect the tester (RS232-socket on the back) using the RS232 cable with the PC (e.g. COM1)
- start the "ETLUpdate" programme

- select the "ETLUpdate"-windowin the interface

- click "Suchen" (search) in the "ETLUpdate"-window

- a new window opens – select the required path for the HEX-Datei with the new Firmware and click on "Öffnen" (open)
- turn on the tester

- press "Starten" (start) in "ETLUpdate"-window

- a new window opens (the procedure is shown in the window "Update in %")

- the download starts and the LED display on the tester clears

- after the download there is a short hum, the "ETLUpdate"-window is automatically closed and the programme version is shown on the tester
- the download is complete

Tip:
Further information about the installation of the ETLUpdate-programme is available on the CD-ROM.

Your notes :