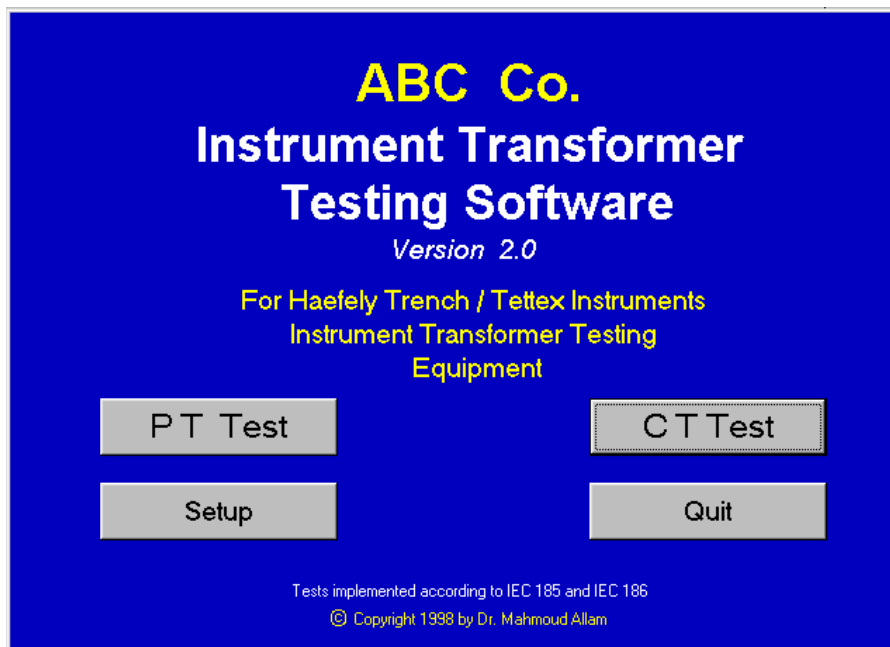


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# Instrument Transformer Testing Software

*Version 3.0*

for Windows XP



for Remote Control Operation of  
**Haefely / Tettex Instruments**  
Instrument Transformer Test Equipment

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© Copyright 1998-2006 by Dr. Mahmoud Allam  
Middle East Technical and Commercial Office  
28 Adly St. Cairo, Egypt

[www.metaco-egypt.com](http://www.metaco-egypt.com)

☎ +20-2-3957638  
Fax: +20-2-3939869  
[info@metaco-egypt.com](mailto:info@metaco-egypt.com)

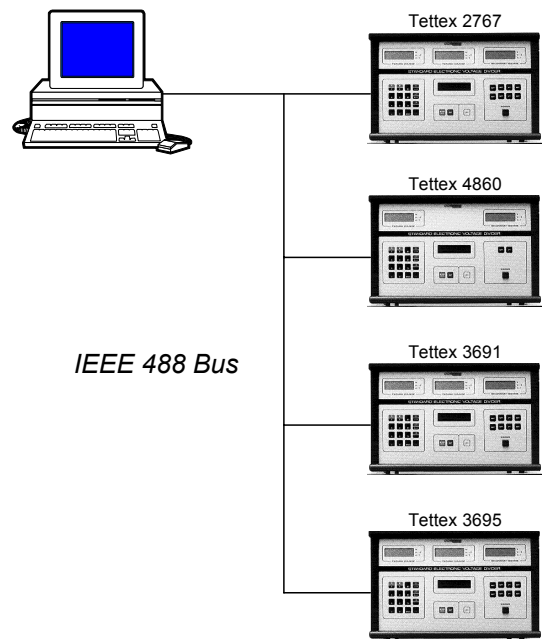
The **Instrument Transformer Testing Software** has been developed to remote control a complete Instrument Transformer testing system consisting of the following Haefely Trench / Tettex Instruments:

- Tettex 2767 Instrument Transformer Test Set
- Tettex 4860 Electronic Standard Voltage Divider
- Tettex 3695/3697 Electronic Voltage Burdens
- Tettex 3691/3692 Electronic Current Burdens

The system components are connected to each other and to the computer via an IEEE 488.2 bus. The user can select which components he/she wishes to use for each test session, allowing each instrument to be controlled either by the computer or manually.

With its user friendly interfaces, the software program allows the user to perform automated test procedures in an accurate and time saving way.

A fully tested IEEE 488.2 controller card (PCI or PCMCIA) is supplied with the software package to ensure compatibility.



The screenshot shows the 'CT Information' window with the following fields and options:

- Type: OCA
- Serial No.: 12-100/1-13
- Customer Name: EEA
- Customer Order No.: 2345/98/CT
- Internal Order No.: 12345
- Primary Current: 300 - 600 A (Series/Parallel selection)
- Rated Voltage: 12 KV (U: 12/28/75 KV)
- I<sub>Thermal</sub>: 30 KA
- I<sub>Dynamic</sub>: 50 KA
- F: 50 Hz
- No. of Cores: 1, 2, 3, 4 (radio buttons)
- Core 1: Rated Current (1A, 5A), Rated Power (20 VA), Class (0.5), Measuring/Protection selection
- Core 2: Rated Current (1A, 5A), Rated Power (10 VA), Class (5P10), Measuring/Protection selection
- Core 3: Rated Current (1A, 5A), Rated Power (20 VA), Class (5P15), Measuring/Protection selection
- Core 4: Rated Current (1A, 5A), Rated Power (20 VA), Class (5P20), Measuring/Protection selection
- Buttons: OK, Cancel

Using standard Windows 95 graphical user interface, the software allows simple and fast selection of transformer data. Different parameter values can be conveniently selected from a list of commonly used values or entered manually.

The lists of commonly used values (or standard values) can be easily updated by the user.

The transformer data is stored in a standard database format and can be easily reloaded or manipulated.

CT Accuracy Test

|                                | Primary in Series |       |        |       | Primary in Parallel |                     |        |  |
|--------------------------------|-------------------|-------|--------|-------|---------------------|---------------------|--------|--|
|                                | Core 1            |       | Core 2 |       | Core 3              |                     | Core 4 |  |
|                                | Burden VA         | cos b | F %    | S Min | Previous Test F %   | Previous Test S Min |        |  |
| 120 % <input type="checkbox"/> | 15                | 0.8   |        |       | 0.1                 | 1                   |        |  |
| 100 % <input type="checkbox"/> | 3.75              | 0.8   |        |       | 0.2                 | 1                   |        |  |
| 20 % <input type="checkbox"/>  | 15                | 0.8   |        |       | -0.3                | 2                   |        |  |
| 10 % <input type="checkbox"/>  | 3.75              | 0.8   |        |       | -0.4                | 3                   |        |  |

TEST

ON OFF

OK Cancel

The program was designed to perform accuracy tests on instrument transformers according to IEC 185 and IEC 186 standards. All tests results measured by the programs are automatically compared with the allowable limits of the corresponding IEC standard (other standards can also be included on request). Any value exceeding the allowable limit for the selected class is displayed in a different color to notify the user.

Additional instrument transformer test results – e.g. partial discharge tests, power frequency tests, overvoltage inter-turn, etc. – can be also entered in the transformer data. Composite error and security factor calculations are also performed automatically by the program.

All transformer data and test results are stored in a Microsoft Access® database format. It is therefore easily manipulated and ready for further analysis.

Other CT Tests

**Power Frequency Tests**

| Prim.                               | Sec./Gr.                            | Prim.                               | Sec./Gr.                            | Sec.                                | Gr.                                 | Sec.                                | Gr.                                 | Sec.                                | Gr.                                 | Sec.                                | Gr.                                 | Sec.                                | Gr.                                 |
|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| 28 KV                               | 1 min                               | 28 KV                               | 1 min                               | 3 KV                                | 1 min                               | 3 KV                                | 1 min                               | 3 KV                                | 1 min                               | 3 KV                                | 1 min                               | 3 KV                                | 1 min                               |
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |

**O.V. I.T. Test**  
In /4.5 KV 50 Hz 1 min

| Core 1                              | Core 2                              | Core 3                              | Core 4                              |
|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |

**P.D. Test**  
1.2 Um  
14.4 KV  
9 pC

**Composite Error**  
Room Temp. 28 °C

| Core 1      | Core 2    | Core 3 | Core 4 |
|-------------|-----------|--------|--------|
| RRT 0.022 Ω | Io 1 A    |        |        |
| Uo 11 V     | Error 2 % |        |        |

**Polarity Check**  OK

**Marking Check**  OK

**Remarks**

- Passed Accuracy Test
- Passed Over-Voltage Inter-Turn Test
- Passed Power Frequency Test
- Passed Partial Discharge Test

Save Print Certificate Cancel Quit

### Hardware/Software Requirements

A PC with the following specifications is required:

- Pentium-IV or equivalent with Windows XP operating system.
- 512 MB of memory
- 40 MB of Hard Disk space for software installation (additional space needed for the data base depends on the amount of transformer data to be stored)
- PCI expansion slot (for the IEEE 488 interface/controller card supplied with the software package)
- Laser printer



**Current Transformer Test Certificate**

Type: \_\_\_\_\_ Serial No.: \_\_\_\_\_ Date: \_\_\_\_\_

|                    |  |
|--------------------|--|
| Customer Name      |  |
| Customer Order No. |  |
| Internal Order No. |  |

|           |        |                                   |                  |
|-----------|--------|-----------------------------------|------------------|
| Primary   | A      | Nominal/Routine/Impulse: _____ KV |                  |
|           |        | Thermal / Dynamic: _____ KA       | Frequency: 50 Hz |
| Secondary | Core 1 | A                                 | VA Class         |
|           | Core 2 | A                                 | VA Class         |
|           | Core 3 | A                                 | VA Class         |
|           | Core 4 | A                                 | VA Class         |

Tested according to IEC 185 and IEC 44-4

**Power Frequency Tests**

|  |  |  |  |
|--|--|--|--|
| Prim. (all Sec. earthed)<br>KV 1 min.      | Prim. 1. (Prim. 2 earthed)<br>3 KV 1 min.  | Prim. 2. (Prim. 1 earthed)<br>3 KV 1 min.  |  |
| Sec. 1 (other Sec. earthed)<br>3 KV 1 min. | Sec. 2 (other Sec. earthed)<br>3 KV 1 min. | Sec. 3 (other Sec. earthed)<br>3 KV 1 min. | Sec. 4 (other Sec. earthed)<br>3 KV 1 min. |

**Over-Voltage Inter-Turn Test**

|                           |                           |                           |                           |
|---------------------------|---------------------------|---------------------------|---------------------------|
| Core 1<br>In 4.5KV 1 min. | Core 2<br>In 4.5KV 1 min. | Core 3<br>In 4.5KV 1 min. | Core 4<br>In 4.5KV 1 min. |
|---------------------------|---------------------------|---------------------------|---------------------------|

**PD Test**

75 KV for 10 sec. then  
45 KV for 1 min  
pC

**Polarity Check**

**Marking Check**

**Composite Error**

|                 |                 |                 |                 |
|-----------------|-----------------|-----------------|-----------------|
| Core 1          | Core 2          | Core 3          | Core 4          |
| Ret = _____ Ω   | Ret = _____ Ω   | Ret = _____ Ω   | Ret = _____ Ω   |
| Error = _____ % | Error = _____ % | Error = _____ % | Error = _____ % |

continued on next page...

**Current Transformer Test Certificate (cont.)**

**Accuracy Tests**

a) Primary windings in Series

| % of rated current | Core 1    |     |        | Core 2    |     |        | Core 3    |     |        | Core 4    |     |        |
|--------------------|-----------|-----|--------|-----------|-----|--------|-----------|-----|--------|-----------|-----|--------|
|                    | Burden VA | F % | δ min. | Burden VA | F % | δ min. | Burden VA | F % | δ min. | Burden VA | F % | δ min. |
| 120                |           |     |        |           |     |        |           |     |        |           |     |        |
| 120                |           |     |        |           |     |        |           |     |        |           |     |        |
| 100                |           |     |        |           |     |        |           |     |        |           |     |        |
| 20                 |           |     |        |           |     |        |           |     |        |           |     |        |

Burden Power Factor = 0.8 for all tests

b) Primary windings in Parallel

| % of rated current | Core 1    |     |        | Core 2    |     |        | Core 3    |     |        | Core 4    |     |        |
|--------------------|-----------|-----|--------|-----------|-----|--------|-----------|-----|--------|-----------|-----|--------|
|                    | Burden VA | F % | δ min. | Burden VA | F % | δ min. | Burden VA | F % | δ min. | Burden VA | F % | δ min. |
| 120                |           |     |        |           |     |        |           |     |        |           |     |        |
| 120                |           |     |        |           |     |        |           |     |        |           |     |        |
| 100                |           |     |        |           |     |        |           |     |        |           |     |        |
| 20                 |           |     |        |           |     |        |           |     |        |           |     |        |

Burden Power Factor = 0.8 for all tests

|                      |                      |
|----------------------|----------------------|
| For customer : _____ | For ABC & Co.: _____ |
|----------------------|----------------------|

Test results can be printed in custom a designed test report or certificate. The report can previewed on the screen before printing and can also exported in different format.

In addition, all test procedures can be customized to conform with typical tests carried out by different users.

**New !**  
In Version 3.0 reports can be saved is several different formats including Word, Excel, HTML, PDF...