

# Multi-Function Meter

## Content

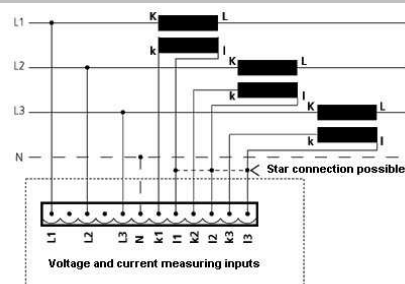
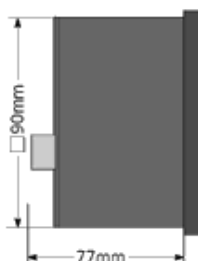
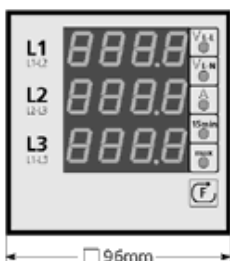
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## Multi-Function Meter DS-01 for AC Current and Voltage

96 x 96 mm

DS 01	Technical Data	Description
<b>Application</b>	Multi-function meter for measuring electrical values in three phase low and high voltage networks.	<p>The DS-01 measures and displays line-neutral and line-line voltages. The instantaneous, 15-minute averaged, and peak values of the measured phase currents are displayed sequentially. The sequencing of displayed parameters is done either automatically or manually on demand. When the instrument is switched on, the same parameter is displayed as at the time it was switched off earlier. When stepping on to the next parameter display, the character "n" appears on the lower left of the display. If the "F" key-switch is kept pressed longer, after 2 seconds the character "r" is indicated and the display steps to the next sequenced parameter. Keeping the "F" key-switch pressed even longer, the character "c" is displayed and the peak and average values are reset.</p> <p>Standard current transformers can be connected directly to the DS-01, because the required shunts are already installed in the instrument. 35 standard current transformer ratios are pre-programmed.</p> <p>The peak values of measurements are also stored and displayed, similar in function to drag-pointer type peak value registration in analog meters. The DS-01 derives its operating power from the voltage measuring inputs, thereby keeping instrument wiring to a minimum. For medium voltage systems, 100 V versions of the instrument are available, which display the primary side voltage, with appropriate scaling.</p>
<b>Voltage</b>	0 ... 600V AC	
<b>Current transformer primary</b>	1/2,5/5/10/15/20/25/30/40/50/60/75/80/100/125/150/200/250/300/400/500/600/750/800/1000/1200/1250/1500/1600/1800/2000/2500/3000/4000 A	
<b>Current transformer secondary</b>	X/ 1 A or x/5 A	
<b>Auxiliary power supply</b>	400/100V AC; (between L1 and L2)	
<b>Voltage range</b>	0,8 ... 1,1 x nominal voltage	
<b>Frequency</b>	50 / 60 Hz	
<b>Consumption</b>	ca. 3VA	
<b>Input impedance</b>	Voltage: 2M $\Omega$ Current (Shunts): 0,01 (0,05) $\Omega$	
<b>Accuracy</b>	Class 1	
<b>Temperature effect</b>	< 0,01% / K	
<b>Operation temperature</b>	+5 °C ... +50 °C	
<b>Storage temperature</b>	-20 °C ... +70 °C	
<b>Creep and airpaths</b>	Group III per DIN VDE 0110-1 Pollution level 2	
<b>Protection rating</b>	Front IP 20, terminals IP 00 per DIN VDE 0470-1 (11/92)	
<b>Display range</b>	0 ... 9999	
<b>Digits</b>	14mm, 7 Segment LED, red	
<b>Anschlußart</b>	Plug-in spring-clamp-connectors	
<b>Wire cross section</b>	Fine stranded wire 2,5mm <sup>2</sup> , max. 7mm stripped	
<b>Weight</b>	ca. 330g	
<b>List price €</b>	<b>DS 01 400 V/ 5 A</b> <b>DS 01 400 V/ 1 A</b> <b>DS 01 100 V for vt</b> <b>DIN rail mounting</b> <b>EN 50022-35 x 7,5</b> <b>Protection cover IP 65</b>	
		<b>Features</b> <ul style="list-style-type: none"> <li>• Three-line digital display simultaneously shows measurements of all 3 phases</li> <li>• Displays 15-minute averaged measurements (bimetallic function)</li> <li>• Peak value storage and display (drag-pointer function)</li> <li>• User selectable standard current transformer ratios</li> <li>• Automatic sequencing of displayed parameters automatically at 10 second intervals, or manually</li> <li>• Large 3-line, 4-digit, 7-segment red LED digital display</li> <li>• Measurement mode indicated by LED's</li> <li>• Easy to install and operate</li> <li>• Plug-in spring clamp connectors</li> <li>• Compact: 65 mm depth</li> <li>• Peak value storage and display</li> <li>• 15-minute averaged measurements (bimetallic function)</li> <li>• Reduces installation and wiring costs</li> <li>• DIN 43700 standard panel mounting enclosure</li> </ul>





## Multi-Function Meter DIRIS Ap

96x96 mm

DIRIS Ap	Technical Data	Description
<b>Application</b>	Multi-function meter for measuring electrical values in single, two and three phase low and high voltage networks.	<p><b>Measurement in real effective values (TRMS) of:</b></p> <ul style="list-style-type: none"> <li>• Current per phase and instantaneous neutral, average and maximum values over a programmable period</li> <li>• Phase-to-neutral and phase-to-phase voltages</li> <li>• Frequency</li> <li>• Active, reactive and apparent power on 4 quadrants (+/-) per phase and total in instantaneous, average and maximum values over a programmable period</li> <li>• Power factor (PF) per phase and total with inductive and capacitive indication.</li> <li>• Harmonic distortion rate (thd) up to 49 on the phase to neutral and phase to phase voltages and the currents (thd 3U, thd 3V, thd 3I, thd In)</li> </ul> <p><b>Meter</b></p> <ul style="list-style-type: none"> <li>• Active, reactive and apparent power meter +/-</li> <li>• Hours run meter 1/100<sup>th</sup> of an hour for duration of operation</li> </ul> <p><b>Optional plug &amp; display modules</b> Easy integration of extra functions (max. 4) by means of modules that the user can snap in at the back of the device at any time.</p> <ul style="list-style-type: none"> <li>• <b>Module 1 - Energy metering</b> 2 programmable pulse outputs for energy metering (+/- kWh, +/- kvarh and KVAh)</li> <li>• <b>Module 2 - Energy Metering + harmonics analysis</b> 3I, In, 3U, 3V up to row 15</li> <li>• <b>Module 3 - Communication RS485</b> RS485 with 2 or 3 wires with JBUS/Modbus protocol and a transmission speed of up to 38400 bauds</li> <li>• <b>Module 4 - Analogue outputs</b> 2 configurable analogue outputs 0 / 4 – 20 mA on 3I, In, 3 U, F, P, Q, S, PF Maximum connecting possibility of 2 modules (4 outputs max.)</li> <li>• <b>Modul 5 - Alarms or control/command</b> 2 inputs for pulse metering or for status, or 3 outputs for alarm monitoring or output command. The monitoring function allows upper and lower alarms threshold to be programmed with time delay and hysteresis. Maximum connecting possibility of 3 modules (6 inputs or 6 outputs, but only 2 outputs on alarm)</li> <li>• <b>Modul 6 - Communication RS485 Profibus DP</b> With RS485 serial link and a transmission speed up to 500 kbauds (2 modules).</li> </ul>
<b>Function</b>	All the parameters can be configured and displayed on its front panel display and measuring and timing functions used.	
<b>Display</b>	Backlit LCD display	
<b>Keys</b>	6 direct access keys	
<b>Dimensions H x W x D</b>	96 x 96 x 60mm (without plug-in modules) 96 x 96 x 80mm (with plug-in modules)	
<b>Protection rating</b>	IP 52 front, IP 30 case	
<b>Terminals</b>	Current connection section 0.5 ... 6 mm <sup>2</sup> Voltage connection section 0.5 ... 6 mm <sup>2</sup> 1 to 5 plug-in module terminals	
<b>Weight</b>	400g	
<b>Measurement</b>		
<b>Current</b> (isolated input terminals) - Current transformer	Consumption: 0,1 VA 1 .. 10.000 A / 1 A or /5 A	
<b>Voltage</b> - direct - voltage transformer, primary - voltage transformer, secondary	50 ... 700 VAC L/L up to 500 kV 60, 100, 110, 173 und 190 V	
<b>Frequenz</b>	45 ... 65 Hz	
<b>Auxiliary power supply</b> (AC & DC)	110 ... 400 VAC ± 10% 50/60 Hz 120 ... 350 VDC / 24 .. 48 V ± 20%	
<b>Accuracy</b> Current (I) Voltage (U) Power (P) Energy	0,5% 0,5% 1% active power: IEC 61036 class 1 Reactive power: IEC 61268 class 2	
<b>Inputs (Option)</b>	2 .. 6 optocouplers 10 ... 30 VDC	
<b>Output pulses (Option)</b>	2 relays 100 VDC - 0,5 A - 10 VA	
<b>Output alarms / control (Option)</b>	2 relays 250 VAC - 6 A - 1600 VA	
<b>Output analogs (Option)</b>	2 ... 4 isolated 0/4-20 mA / 600 Ohm	
<b>Operating temperature</b>	-10 ... + 55 °C	
<b>List price €</b>	<b>DIRIS Ap</b> <b>Module 1 : Energy (kWh)</b> <b>Module 2 : Energy + Harmonics</b> <b>Module 3 : Communication RS 485</b> <b>Module 4 : Analogue Output</b> <b>Module 5 : Alarms, control</b> <b>Module 6 : Profibus (2 modules)</b>	



## Multi-Function Meter Diris A20/A40/A41

96 x 96 mm

DIRIS A20/ A40/ A41	Technical Data	Description																																																									
<b>Application</b>	Multi-function meter for measuring electrical values in single, two and three phase low and high voltage networks.	<b>Measurement in real effective values (TRMS) of:</b> <ul style="list-style-type: none"> <li>• Current per phase and instantaneous neutral, average and maximum values over a programmable period</li> <li>• Phase-to-neutral and phase-to-phase voltages</li> <li>• Frequency</li> <li>• Active, reactive and apparent power on 4 quadrants (+/-) per phase and total in instantaneous, average and maximum values over a programmable period</li> <li>• Power factor (PF) per phase and total with inductive and capacitive indication.</li> <li>• Harmonic distortion rate (thd) up to 49 on the phase to neutral and phase to phase voltages and the currents (thd 3U, thd 3V, thd 3I, thd In)</li> </ul> <b>Meter</b> <ul style="list-style-type: none"> <li>• Active, reactive and apparent power meter +/-</li> <li>• Hours run meter 1/100<sup>th</sup> of an hour for duration of operation</li> </ul> <p>The <b>Diris A20</b> will display only total power values of active, reactive, apparent power, frequency, power factor (PF) .</p> <p>The <b>Diris A40</b> will display also the phase values of apparent power, frequency power factor (PF) .</p> <p>The <b>Diris A41</b> contains a integrated current transformer for high accuracy harmonic measurement in neutral lead.</p>																																																									
<b>Function</b>	All the parameters can be configured and displayed on its front panel display and																																																										
<b>Display</b>	Backlit (blue) LCD display																																																										
<b>Keys</b>	6 direct access keys																																																										
<b>Dimensions H x W x D</b>	96 x 96 x 60mm (without plug-in modules) 96 x 96 x 80mm (with plug-in modules)																																																										
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<b>Auxiliary power supply</b> (AC & DC)	110 ... 400 VAC ± 10% 50/60 Hz 120 ... 350 VDC / 24 .. 48 V ± 20%																																																										
<b>Accuracy</b> Current (I) Voltage (U) Power (P) Energy	0,2% 0,2% 0.5% Active power: IEC 61036 class 0.5 Reactive power: IEC 61268 class 2																																																										
<b>Inputs (Option)</b>	2 .. 6 optocouplers 10 ... 30 VDC																																																										
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<b>Operating temperature</b>	-10 ... + 55 °C																																																										
<b>List price €</b>	<b>DIRIS A20</b> <b>DIRIS A40</b> <b>DIRIS A41</b>  <b>Module 1 : Energy (kWh)</b> <b>Module 2 : Energy + Harmonics</b> <b>Module 3 : Communication RS 485</b> <b>Module 4 : Analogue Output</b> <b>Module 5 : Alarms, control</b> <b>Module 6 : Profibus (2 modules)</b>																																																										
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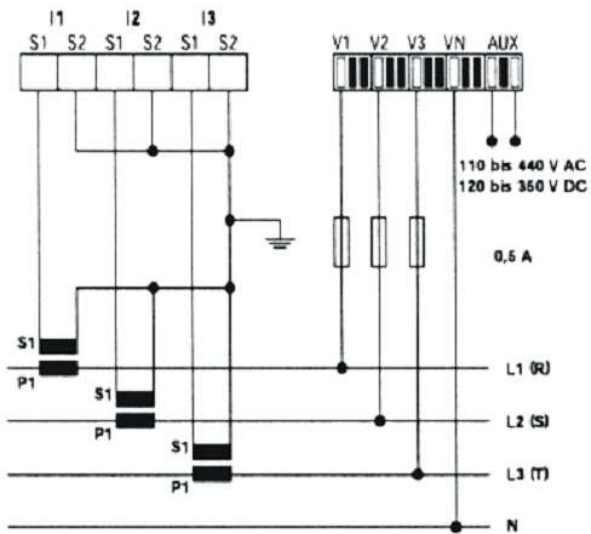


## Multi-Function Meter DIRIS Am

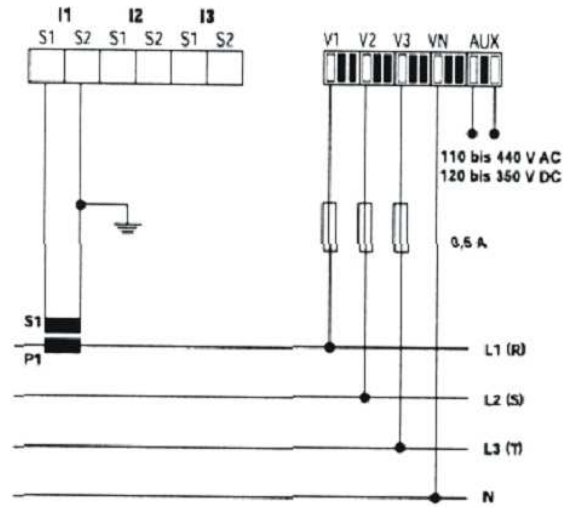
DIN rail mounting

DIRIS Am	Technical Data	Description
<b>Application</b>	Multi-function meter for measuring electrical values in single, two and three phase low and high voltage networks.	<p>Using electrical parameters can mean using several analogue or digital single-function products such as ammeters, voltmeters and wattmeters. Diris Am, with its six direct access keys and LCD display, help you use all the parameters in an LV and HV installation. These parameters can be centralized on a PC or a PLC through an RS 485 link using JBUS/ MOSBUS protocol. The Diris Am is easy to install and can be DIN rail mounted.</p> <p><b>Measurement in real effective values (TRMS) of:</b></p> <ul style="list-style-type: none"> <li>• Current per phase and instantaneous neutral, average and maximum values over a programmable period</li> <li>• Phase-to-neutral and phase-to-phase voltages</li> <li>• Frequency</li> <li>• Active, reactive and apparent power on 4 quadrants (+/-) per phase and total in instantaneous, average and maximum values over a programmable period</li> <li>• Power factor (PF) per phase and total with inductive and capacitive indication.</li> </ul> <p><b>Meter</b></p> <ul style="list-style-type: none"> <li>• Active, reactive and apparent power meter +/- Hours run meter 1/100<sup>th</sup> of an hour for duration of operation</li> </ul> <p><b>Options</b></p> <p>Die Diris Am is available with the following options (not plug-in modules):</p> <ul style="list-style-type: none"> <li>• <b>Energy metering</b> 2 programmable pulse outputs for energy metering (+/- kWh, +/- kvarh and KVAh)</li> <li>• <b>Communication RS485</b> RS485 with 2 or 3 wires with JBUS/Modbus protocol and a transmission speed of up to 38400 bauds</li> </ul>
<b>Keys</b>	6 direct access keys	
<b>Dimensions H x W x D</b>	126 x 110 x 63 mm	
<b>Mounting</b>	DIN-Rail	
<b>Protection rating</b>	IP 52 front, IP 20 case	
<b>Terminals</b>	Terminal block	
<b>Cable connection</b>	Flexible cable : 1 ... 6 mm <sup>2</sup> Rigid cable : 1,5 ... 10 mm <sup>2</sup>	
<b>Weight</b>	640 g	
<b>Measurement</b>		
<b>Current</b> (isolated input terminals) - Current transformer	Consumption: 0,1 VA 1 .. 10.000 A / 1 A or /5 A	
<b>Voltage</b> - direct - voltage transformer, primary - voltage transformer, secondary	50 ... 700 VAC L/L up to 400 kV 60, 100, 110, 173 und 190 V	
<b>Frequency</b>	45 ... 65 Hz	
<b>Auxiliary power supply</b> (AC & DC)	110 ... 400 VAC ± 10% 50/60 Hz 120 ... 350 VDC ± 20%	
<b>Accuracy</b>		
Current (I)	0,5%	
Voltage (U)	0,5%	
Power (P)	1%	
Energy	active power: IEC 61036 class 1 Reactive power: IEC 61268 class 2	
<b>Output pulses (Option)</b>	Relay 100 VDC - 0,5 A - 10 VA	
<b>Operating temperature</b>	-10 ... + 55 °C	
<b>List price €</b>	<b>DIRIS Am</b> <b>DIRIS Am with energy output</b> <b>DIRIS Am with communication</b> <b>RS 485 - MOD-BUS</b> <b>DIRIS Am with energy + RS 485</b>	

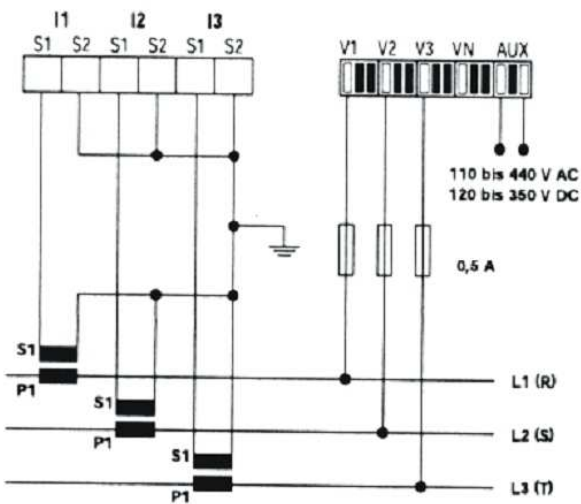
3 phase unbalanced 4 wires with 3 CTs



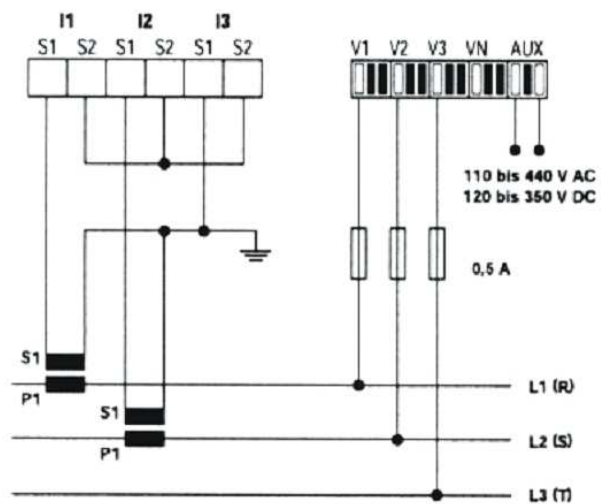
3 phase balanced 4 wires with 1 CTs



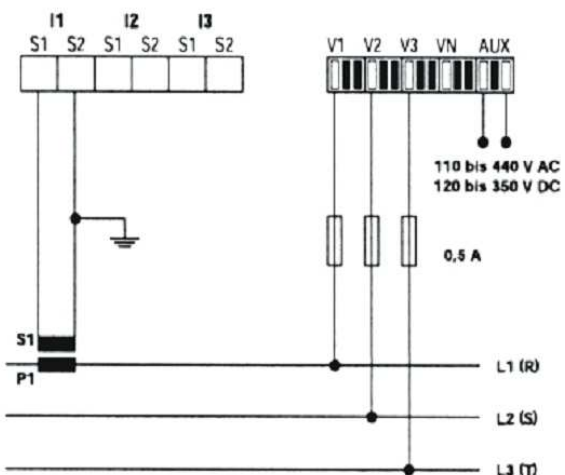
3 phase unbalanced 3 wires with 3 CTs



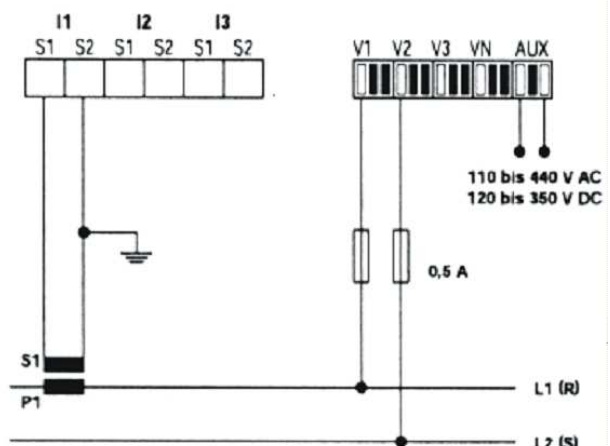
3 phase unbalanced 3 wires with 2 CTs



3 phase balanced 3 wires with 1 CTs



2 phase net





## Multi-Function Meter Multis L72

72 x72 mm

DIRIS Multis L72	Technical Data	Description
<b>Display</b>	3 line LED, 4 digits, 7 segments, 10 mm	
<b>Keys</b>	2 push buttons	
<b>Dimensions H x W x D</b>	72 x 72 x 83 mm	
<b>Protection rating</b>	Front IP 54, Case IP 20	
<b>Terminals</b>	Terminal block	
<b>Cable connection</b>	Flexible cable : until 2.5 mm <sup>2</sup> Rigid cable : until 2.5 mm <sup>2</sup>	
<b>Weight</b>	250 g	
<b>Measurement</b>		
<b>current</b> (non isolated Inputs)	consumption: < 0,5 VA	
- ct primary	5 ... 8.000 A	
- ct secondary	5 A	
<b>Voltage</b>		
Range	35 ... 480 V L-L	
<b>Frequenz</b>	40.0 ... 80.0 Hz	
<b>Hours run</b>	Max. value 999999.9 Counts if U <sub>12</sub> > 35 V	
<b>Auxiliary power supply</b>	230 or 400 VAC / +/- 20%, 2.5 VA	
<b>Accuracy</b>		
Current	0,5% +/- 1 Digit	
Voltage	0,5% +/- 1 Digit	
Frequency	+/- 0,2 Hz	
<b>Operating conditions</b>		
Operation temperature	-15 ... + 50 °C	
Storage temperature	-20 ... + 70 °C	
<b>List price €</b>	<b>Multis L72</b>	

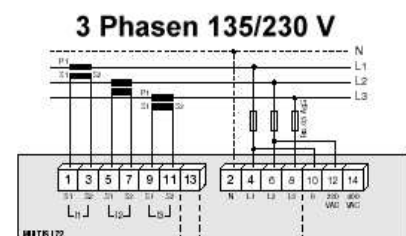
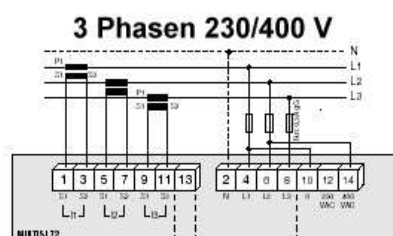
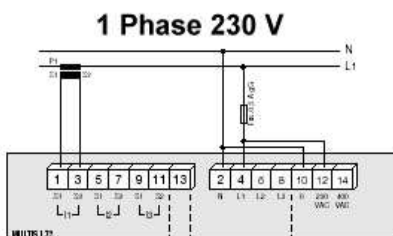
The Multi L72 is digital low voltage three phase measurement device for current, voltage and frequency. It displays three phase instantaneous, average and maximum values of current and voltage. In addition the frequency and hours run will be monitored. Current transformer ratio and integration time can be programmed with setup functions. The 3 line LED display allows the simultaneously control of all three phases. The connection is possible with one, two and three – phase nets.

### Measurement of True-RMS Values

- instantaneous, average and maximum values of current
- Phase voltage
- Frequency (Hz)

### Counter

Hours run with 0.1 h resolution if U<sub>12</sub> > 35 V



## Software Control Vision

### Functions

DIRIS VISION is the visualization software for DIRIS Am and Ap ranges. It operates in a Windows environment 98, NT4 (pack6), Millenium, 2000 or XP with a minimum PC configuration of: Pentium II, 64 Mb RAM, hard disk space of at least 200 Mb, one or more RS232 or RS485 serial ports, a 17" VGA 1024x768 screen.

### General characteristics

The DIRIS VISION software allows you to visualization of:

- all of the electrical measurements in instantaneously
- alarms, harmonics, the energies and the index (DIRIS Ap input)

Allows you to export to EXCEL, for each Diris, the historical table.

- immediate measurements,
- of the energies and the index, the harmonics
- The visualization of the immediate device values can be in an analogue or digital format.

The DIRIS VISION software is available in a multilingual version with the following languages

- English
- French
- German
- Italian

The software provides the following functions:

#### Instantaneous visualization for each device:

- Digital display of:
  - current by phase
  - average of the 3 phase current
  - voltage (U, V) by phase
  - average of the 3 phase voltage (U, V)
  - frequency
  - power (active, reactive and apparent)
  - power factor by phase and total
  - energy (active +/-, reactive +/- and apparent)
  - impulse metering input (DIRIS Ap)
  - THD current and voltage by phase (DIRIS Ap)
- Analogue display of:
  - current by phase
  - voltage by phase
  - frequency
  - total active power
  - total power factor
  - active energy
  - hour metering
- Spectral form
  - harmonics tram rows 3 to 15 current and voltage per phase

Displaying of the general readings of a/l the DIRIS connected to the network:

- Reading of immediate measurements and alarms (DIRIS Ap)
- THD current and voltage per phase
- Reading of the energy meters (active, reactive and apparent) and impulse meter input index (DIRIS Ap)

The Software will be stored on the disk of a PC. To connect the RS485 bus system with a PC running Control Vision a Converter USB > RS485 is required. It is also possible to connect the RS485 bus system to a Ethernet network. In this case TCP/IP Masters and Slaves are required.

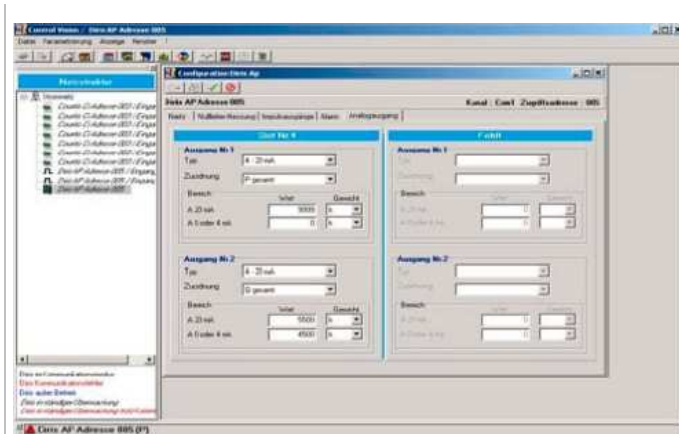
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		<b>List price €</b>
<b>Software Control Vision</b>	1 .. 256 devices	
	> 257 devices	<b>On request</b>
<b>USB / RS485 converter</b>		
<b>Master Gateway RS232 / TCP/IP</b>	<b>48990017</b>	
<b>Slave Gateway TCP/IP / RS485</b>	<b>48990016</b>	

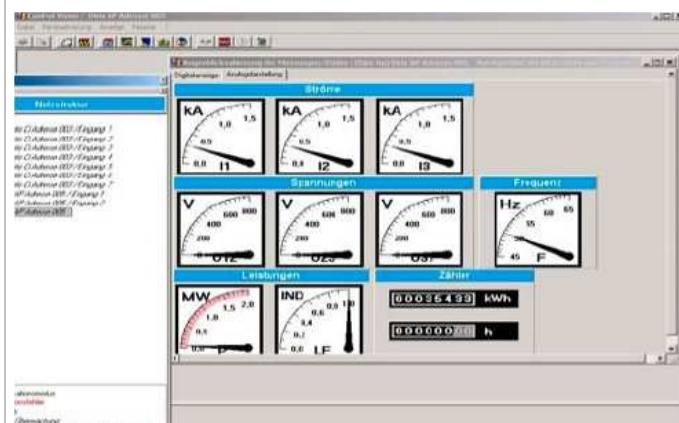


# Software Control Vision

Configuration of a Diris Ap

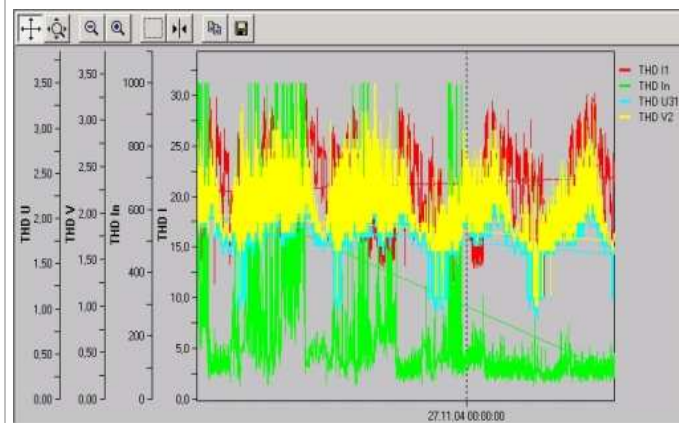


Analogue statement of the instantaneous measurement



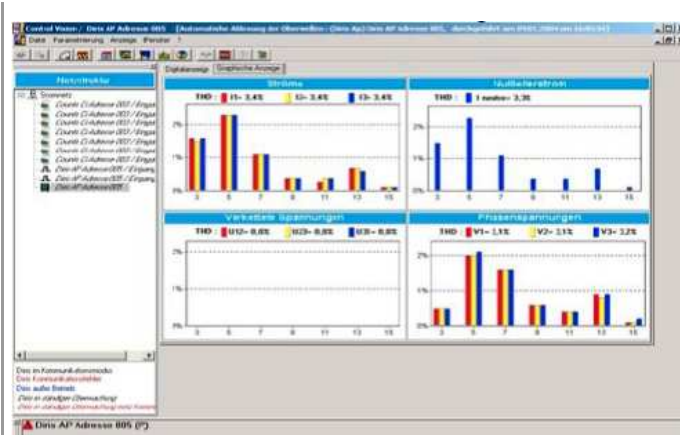
General reading of the Diris measurement

Measurement curve

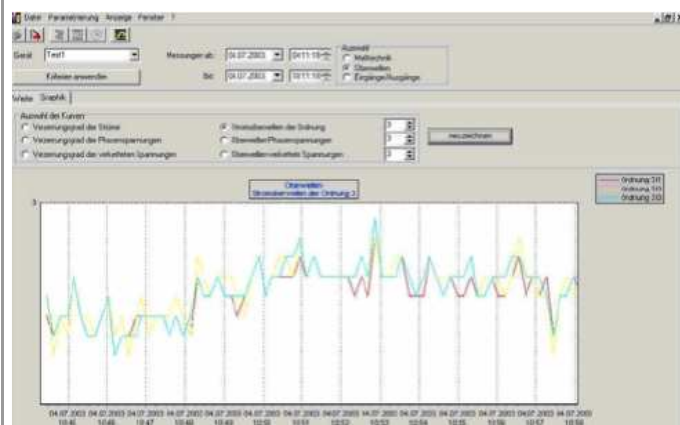


# Software Control Vision

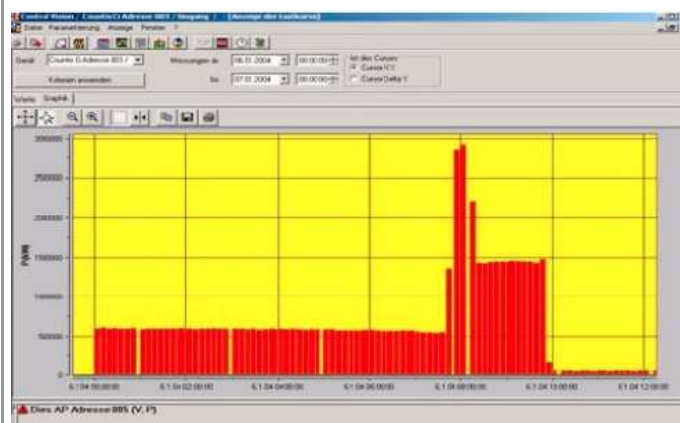
General harmonics reading



Measurement curve of harmonics



Load curve



General meter reading

Name	E+ (kWh)	E- (kWh)	E+ (kvarh)	E- (kvarh)	E+ (kVAh)	Messgerät 1	Messgerät 3
Büro	40352	0	469	196	40560	172936 kWh	223 kWh
- Test2 / Eingang 1	0	0	0	0	0	Eingang 1: 6487 kWh	
- Test2 / Eingang 2	0	0	0	0	0	Eingang 2: 110040 kWh	
- Test2 / Eingang 3	0	0	0	0	0	Eingang 3: 223 kWh	
- Test1	40352	0	469	196	40560	0 kWh	
Test2 / Eingang 4	0	0	0	0	0		Ein
Test2 / Eingang 5	0	0	0	0	0		
Test2 / Eingang 6	0	0	0	0	0		
Test2 / Eingang 7	0	0	0	0	0		
T1	Deltek	Deltek	Deltek	Deltek	Deltek	Deltek	Deltek
T2	Deltek	Deltek	Deltek	Deltek	Deltek	Deltek	Deltek

## Energy-Management-System with Control Vision

