2333b Power Quality Recorder/Analyser

by **ALPTEC**

- Measures to EN50160 or any other standard
- Simple to use
- Volts, Amps, Watts
- Dips, Swells, Breaks
- Max. Power & Current
- Harmonics & IH to 51.5
- Rogowski Coils for Amps
- Light weight & portable
- User friendly software
- IEC 61000-4-30 Class A

The **ALPTEC 2333b** samples both the voltages and currents in the three phases and the neutral 10240 times per second, which is 2048 times per 10 cycles. This high definition measurement enables the precise determination of the waveforms.

The basic data is used to calculate the slow fluctuations, dips, swells and waveform, and the 200 msec mean values are used to derive the interruptions, frequency deviations, flicker, symmetrical components, active and reactive power and distortion as well as harmonics and inter-harmonics up to 51.5. All of these values are averaged over the Integration Period which is 10 mins. by default and can be set by the operator to values between 1 min. and 1 hour. For an IP of 10 min. the large memory will hold two months data, and for an IP of 1 hour, 1 year's data. Tariff-change command events can be recorded. Whilst running, the ALPTEC2333b always makes *all* these calculations which are memorised, together with any events detected. Real-time measurements can be displayed on a PC. In operation it is powered from the voltage connections and LEDs confirm the system status. An internal battery keeps the system live during a power cut of up to 30 mins. After a measurement program, the operator can choose which data to download. The standard download template is EN 50160, but any or all of the data can be recovered.

Communication is by USB or an inbuilt GSM modem.

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Events are recorded thus:-

When one of the voltage or current values overshoots a threshold, for example 10% of nominal, a first point is recorded, and then for each sliding half period (20 msec), a further point if the value is further out of threshold by more than 10% nom. The factory setting for ALPTEC2333 records the sampling data (2048 points/sec.) of the waveform during the out of conformity event. This function can be disabled by the operator.

The standard measurement program configured at the factory is detailed below - (This can be easily user-modified) Star connection, Nominal Voltage 230 Vrms, Nominal current 5Arms, Integration period 10 minutes, Network Frequency 50 Hz. Voltage transformer 230/230, voltage hysterisis 10%, current hysterisis 10%. The power quality thresholds are those of EN50160, and the bargraphs are 200 to 250 Vrms, power factor 0.5 to 1, frequency 49.5 to 50.5. Harmonics 2 to 24.

RECORDING

Sampling Rate

10240 Hz sychronised to the network frequency. Accuracy 10 cycles FFT Freq. Range 30 to 2200 Hz.

Measured Values: -

Mean RMS Values over 200 msec periods

Recorded Values Over 1 or 10 min., 2 Hrs., 24 Hrs. or 7 Day periods

Current ranges 300, 1000 or 3000 Amps rms selected by front panel knob

Frequency

45 to 57.5 Hz. Res. 10 mHz., Intrinsic error 30 mHz. Can be set for 60 Hz. Class A according to IEC-61000-4-30

Dips & Swells

1 cycle RMS measurements. Rolling window of half cycle Reference voltage is V nominal. Intrinsic error <1% Class A according to IEC-61000-4-30

Flicker

Pst (10 minutes), Plt (2 hours) to IEC-6100-4-30 Measurement range 0—20 Intrinsic error <5% of Vnom. Class A according to IEC-61000-4-30

Voltage & Current Harmonics

From H0 to H51 measured every 200msec to IEC 61000-4-7 Recorded Values 10 mins., 2 Hrs., 24 Hrs., 7 Days Class A according to IEC-61000-4-30

Imbalance

Class A according to IEC-61000-4-30

Active Power According to IEC-61036 class 2

Reactive Power

According to IEC-61268 class 2

Power Distortion

According to IEC-61036 class 2

Technical Data Current measurement inputs

The current is measured with MADE-FLEX Rogowski coils of loop dia.45 mm. and coil dia. 10 mm.

Harmonics and Inter-Harmonics

The system measures all harmonics up to 51, and IH up to 50. The standard data transfer format transfers those up to 25, and this can be changed to analyse any number of harmonics up to 51 by the user. Where the transfer has been made of up to 51 harmonics, the software displays either 2 to 25 or 24 to 51, and similarly for the inter-harmonics.

Power Supply

CATIII - 600 V From the measurement inputs, automatically switched

between 215/600 Vac for three phase and 125/345 Vac for monophase.

The internal battery is charged during use, and will keep the system active for 30 mins after power failure.

IP 54 Operating Conditions

Working temperature	0 to 50°C	
Storage	$-20 \text{ to} + 70^{\circ} \text{C}$	
Relative Humidity	80% without condensation	
H61 Pole Mounted IP43 version, case size 35 x 49 x 20cm.		
weight 6.5 kg without	ut the Quadrent (2.1kg)	

Qualification

Safety rules	EN61010-1	
EMC	NF EN 50081-2	EN55011 Class A

A **Calibration** check is recommended every two years

Susceptibility to Disturbance

NF EN 50082-2	IEC 1000-4-2 EN	61000-4-2
EN 61000-4-4	EN 61000-4-6	EN 61000-4-11

Transport

Supplied in carrying case

Dimensions - 340 x 295 x 152 mm. **Weight** 4.8 kg.

Supplied Accessories

- 1 3– phase voltage cable
- 1 single phase voltage cable
- 1 USB interface cable
- 1 current cable with 3 Rogowski-coil current transducers.
- 1 folder with the calibration certificate, user manual & Winalp 2400 disk & manual



ALPTEC2333b powers itself from the measurement

connection, and so needs no other power supply. It has an internal battery which will carry it over power interruptions of up to 30 minutes. Voltage connections are made by 4 mm. banana plugs or crocodile clips for three phase connections or by a standard mains plug for single phase. Current connections are made using **Rogowski** coils of which two sizes are available. After connection it is turned on with the front panel switch.

Front Panel Information

The LEDs on the front panel indicate the operational state of the instrument. The "Power" LED is Green when the instrument is On. The "Status" LED flashes orange when the voltage connections give other than a periodic signal close to 50 Hz. When the instrument is receiving a 50 Hz. input to which it has synchronised, this light becomes Green. The "Memo" LED is out when there is no recording in progress or planned. When a measurement program is preset, this LED flashes 25% on, 75% off. Once the recording program starts this ratio changes to 50%/50% and when the program has finished it becomes 75%/25%.

The "Range select" button is used to change the current measurement range by brief presses and the range selected (300, 1000 or 3000 Amps) is indicated by a LED.

The L1, L2, & L3 LEDs above the voltage and current connector sockets will flash regularly and sequentially if the phase connections are correct, and irregularly if they are incorrect. Thus there is sufficient information available from the front face to establish that the instrument is correctly connected and programmed for measurement without recourse to a computer. However, if desired, real time measurements can be displayed on a computer for further confirmation of correct operation or analysis.



Voltage and current leads are supplied with the **Alptec 2333b** which are suitable for all normal connection situations such as in this sub-station at left.

The **Alptec 2333b** has handy storage space for these connection leads, as seen below, making the system a truly portable package.



Winalp2400 Software

The **Winalp2400** software is the **result of years of experience** of operating Power Quality Monitors and presenting the data from them. It is extremely complete, with a wide range of analysis and presentation tools, to satisfy the most enthusiastic Power Quality gurus. However, the **simple** operations are **easy to perform**.

All the standard functions of setting up a measurement campaign, transferring the resulting data to the computer and the subsequent analysis of the data and report preparation are performed using Wizards.

Opening Winalp2400 presents the Starting Wizard page

Below is an example page of an automatically prepared report : Note that the reports are output directly in WORD format for easy modification if required.

