

Redefining the Oscilloscope Yet Again

ZDS2024 Plus Four-channel Oscilloscope

250Mpts

Memory depth

330,000
wfms/s

• Waveform capture rate

25 kinds

• Protocol decoding

CAN FD

Protocol triggering and decoding

33 kinds

• Trigger modes

51 kinds

• True parameter measurement statistics

PowerAnalyse

Power supply analysis software

7 kinds

• One-key operations

4Mpts

• FFT analysis function



What really counts is not what we do, but whether we change the world from 0 to 1 in case of every innovation from us!

周立功

Product Origins

In the early days of its foundation, developing state-of-the-art instruments was the dream of ZLG Guangzhou ZHIYUAN Electronics Co., Ltd. (hereinafter referred to as "ZHIYUAN Electronics"). At that time, the domestic instrument industry was completely monopolized by foreign manufacturers. In particular, the oscilloscope contributed to the largest consumption of all electronic measuring instruments; however, all popular brands were imported from foreign countries. Although the domestic digital oscilloscope has a history of nearly 10 years, there are still many technical and quality problems centering on measurement precision, waveform capture rate, memory depth, analog bandwidth, sampling rate, and signal analysis. In fact, even though the oscilloscope is the only universal electronic measurement instrument, China does not have much say on the matter. ZHIYUAN Electronics is determined to change this by manufacturing oscilloscopes and making them a competitive product for establishing a benchmark for this national brand.

- In 2004
- In 2005
- In 2007
- In 2008
- In 2010
- In 2012
- In October 2014

ZHIYUAN Electronics developed a virtual oscilloscope to accumulate relevant technology.

ZHIYUAN Electronics cooperated with colleges and universities to start preliminary research on the oscilloscope.

ZHIYUAN Electronics participated in formulating the national standard of the digital oscilloscope.

ZHIYUAN Electronics developed the first desktop to accumulate and sum up relevant experience for starting research on a second model.

The second oscilloscope came to the market in small quantities as a trial production. Since it was not a competitive product according to the strict standards of ZHIYUAN Electronics, the market opportunity was set aside in order to begin research on a third model.

That same year, ZHIYUAN Electronics started on its proposal for preliminary research of the 1-GHz amplifier and 5-GS/s ADC.

ZHIYUAN Electronics developed a third oscilloscope. However, its release was postponed to improve user experience. ZHIYUAN Electronics is a late bloomer for pursuing competitive products and good quality.

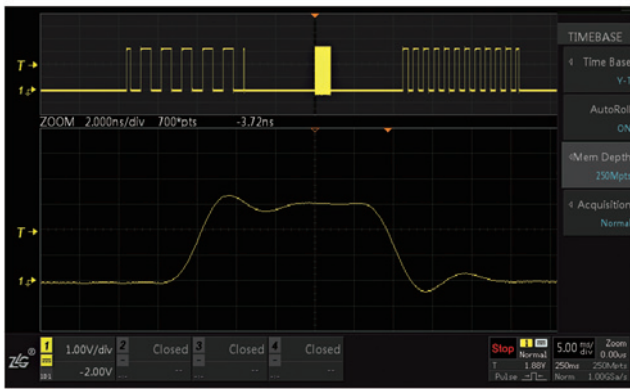
The ZDS2000 series oscilloscope went on sale, which was the pinnacle of perfection.

Product Type	ZDS2022	ZDS2022 Plus	ZDS2024	ZDS2024 Plus
Input channel	2	2	4	4
Analog bandwidth (-3dB)	200MHz	200MHz	200MHz	200MHz
Maximum real-time sampling rate	1GSa/s for each channel	1GSa/s for each channel	1GSa/s for each channel	1GSa/s for each channel
Memory depth of channel	112Mpts@1ch 56Mpts@2ch	250Mpts@1ch 125Mpts@2ch	112Mpts@1ch 56Mpts@2ch	250Mpts@1ch 125Mpts@2ch
Maximum waveform capture rate	>330kwfms/s	>330kwfms/s	>330kwfms/s	>330kwfms/s
Range of time base	1ns/div ~ 50s/div	1ns/div ~ 50s/div	1ns/div ~ 50s/div	1ns/div ~ 50s/div
Range of vertical sensitivity (1:1)	2mv/div ~ 10V/div	2mv/div ~ 10V/div	2mv/div ~ 10V/div	2mv/div ~ 10V/div
Protocol decoding (standard configuration)	UART, SPI, I ² C, USB, PS/2, DALI, Wiegand, 1-Wire, DS18B20, HDQ, SD_SPI, SD_SD, IrDA, Manchester, DiffManche, Miller, DHT11, SHT11, NEC, RC5, RC6, CAN, LIN, FlexRay	UART, SPI, I ² C, USB, PS/2, DALI, Wiegand, 1-Wire, DS18B20, HDQ, SD_SPI, SD_SD, IrDA, Manchester, DiffManche, Miller, DHT11, SHT11, NEC, RC5, RC6, CAN, LIN, FlexRay, CAN FD	UART, SPI, I ² C, USB, PS/2, DALI, Wiegand, 1-Wire, DS18B20, HDQ, SD_SPI, SD_SD, IrDA, Manchester, DiffManche, Miller, DHT11, SHT11, NEC, RC5, RC6, CAN, LIN, FlexRay	UART, SPI, I ² C, USB, PS/2, DALI, Wiegand, 1-Wire, DS18B20, HDQ, SD_SPI, SD_SD, IrDA, Manchester, DiffManche, Miller, DHT11, SHT11, NEC, RC5, RC6, CAN, LIN, FlexRay, CAN FD
Trigger function	11 basic triggers, 21 protocol triggers, and an innovative mask trigger	11 basic triggers, 22 protocol triggers, and an innovative mask trigger	11 basic triggers, 21 protocol triggers, and an innovative mask trigger	11 basic triggers, 22 protocol triggers, and an innovative mask trigger
Automatic measurement	51 automatic measurement and statistic functions			
Mathematic function	Addition, subtraction, multiplication, division, differentiation, integration, and FFT			
FFT	4 Mpts, supporting window functions including rectangular window, Hamming window, Hann window, and Blackman window			
Display screen	9-inch WVGA color display screen with resolution of 800*480			
Waveform display	256 gray level display and color temperature display; supporting variable persistence			
Interface	USB Host, USB Device, LAN, RS-232C, Trig Out, Trig In			
Waveform search	Search conditions: rising edge, falling edge, rise time, fall time, positive pulse width, negative pulse width, positive duty cycle, negative duty cycle, cycle, frequency, positive runt pulse, and negative runt pulse			

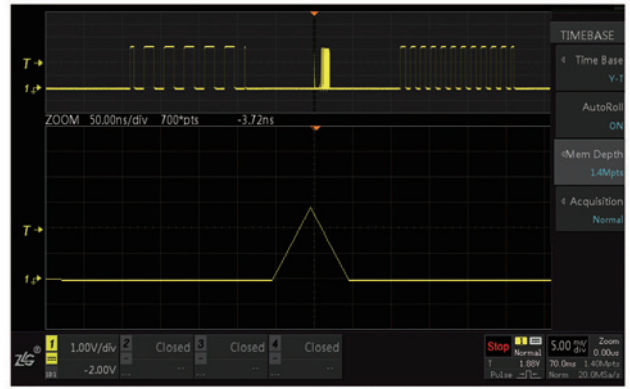
250M memory depth

A sufficient memory depth enables the maximum waveform sampling rate to be achieved, so users can observe a more authentic and delicate waveform. However, if the memory depth is only 1Mpts or less, the oscilloscope will be forced to reduce the sampling rate when observing the waveform with a longer duration. The number of sampling points is not sufficient, so the waveform shown by the oscilloscope will be severely distorted or even waveform aliasing may occur, thereby misleading users' measurements and analysis.

The ZDS2024 Plus oscilloscope innovatively applies DDR3 storage technology to reach a maximum memory depth of 250M with the help of large-scale FPGA devices, hardware acceleration, and simultaneous multithreading processing. Users will not lose waveform details when observing long-duration waveforms.



The sampling rate stays 1G in 250M memory depth, and the waveform detail is crystal clear.

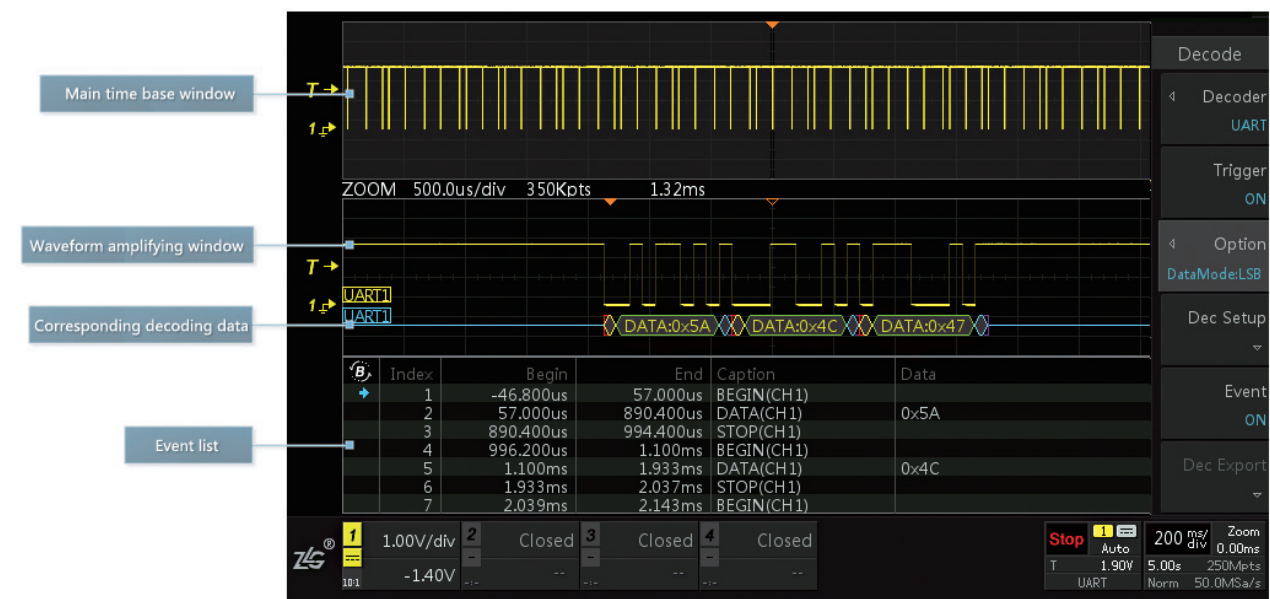


The sampling rate drops to 20M in a memory depth of 1.4M, and the waveform is in total distortion.

25 kinds of protocol decoding

When debugging protocol signals, users will not only observe protocol waveforms, but also decode waveforms to corresponding data. However, the protocol decoding function of different brands of the oscilloscope has only been an optional configuration at an additional cost. Moreover, only manufacturers of very few brands provide this service.

The ZDS2024 Plus oscilloscope is unprecedentedly equipped with 25 kinds of protocol decoding for free, including CAN, LIN, I²C, SPI, UART, USB, PS/2, DALI, Wiegand, 1-Wire, DS18B20, HDQ, SD_SPI, SD_SD, IrDA, Manchester, DiffManche, Miller, DHT11, SHT11, NEC, RC5, RC6 and FlexRay. In addition, the ZDS2024 Plus becomes the world's exclusive oscilloscope to be equipped with free CAN FD protocol decoding, truly defining the 200M oscilloscope yet again.



330,000 wfms/s waveform capture rate

Due to the limitations of the waveform synthesizer's real-time processing capacity and waveform memory throughput bandwidth, the waveform capture rate of the 2000 series oscilloscope is generally very low. In addition, there is much dead time when observing the waveform. Therefore, users will miss many waveform details, substantially reducing their working efficiency. The research and development group of the ZDS2024 Plus oscilloscope uses a large-scale FPGA, solves various technical difficulties, and tries different realization approaches for each line of code to seek the best results. From 75K in the beginning to 150K, 260K, and even 330K, the group members continuously beat their own records while improving. Higher waveform capture rate enables users to quickly find abnormal signals and greatly improve working efficiency.



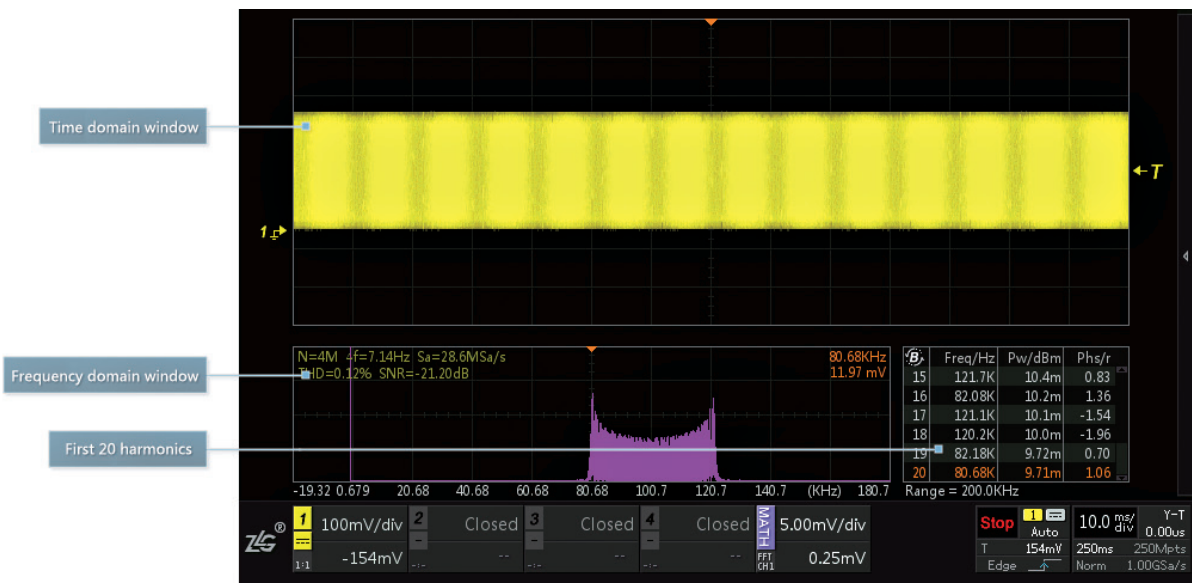
Mask Trigger

Engineers may often come across some signals that are hard to capture when debugging the product. Are we able to capture it with an easy and simple method even without any knowledge of the signal's characteristics? Based on the powerful trigger function of the oscilloscope, the research and development group innovatively adds a mask trigger function that is able to isolate any regular abnormal signals with a touch filtration theory. This makes testing simple and fun.



4Mpts FFT analysis

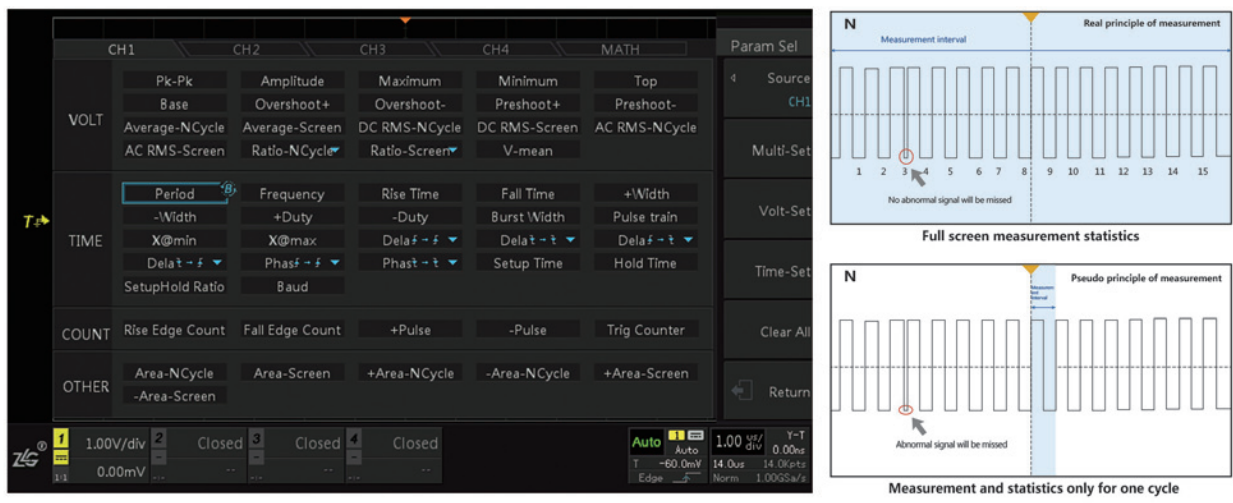
The majority of 2000 series oscilloscopes on the market can only support the FFT analysis of 8K sample points at most. If the sampling rate is 1G, the frequency resolution is only 125 KHz; therefore, in most cases, it is impossible to accurately judge the spectral distribution of signals. The ZDS2024 Plus oscilloscope eliminates the simple function parcel. It applies a professional processing chip internally, breaks through technical barriers, and upgrades the number of FFT analysis points to 4M sample points. Its frequency resolution can be accurate to 250 Hz under the same sampling rate of 1G, and it is able to accurately analyze the source of interference in circuits as to greatly improve the practical value of the oscilloscope's FFT. The 4Mpts FFT analysis function symbolizes a breakthrough in quantity and a leap in quality.



Supports automatic measurement of 51 parameters

It is not enough to analyze a waveform only by its visual form. Only by precisely quantifying waveform indicators can users thoroughly understand the nature of waveform abnormality. However, limited by architecture and the chip, the parameter measurements of most oscilloscopes is done by sample points based on sampling results. Regardless of how many signal periods appear on the screen, only one periodic signal of each screen is taken for statistical measurement, which directly leads to a severely distorted result.

To realize true parameter measurement statistics, we apply the FPGA for all hardware acceleration to calculate the maximum value, minimum value, average value, and standard deviation of each indicator by measuring each periodic signal on the screen, thus realizing the true parameter measurement function. The automatic measurement of 51 parameters is supported.



Waveform search function

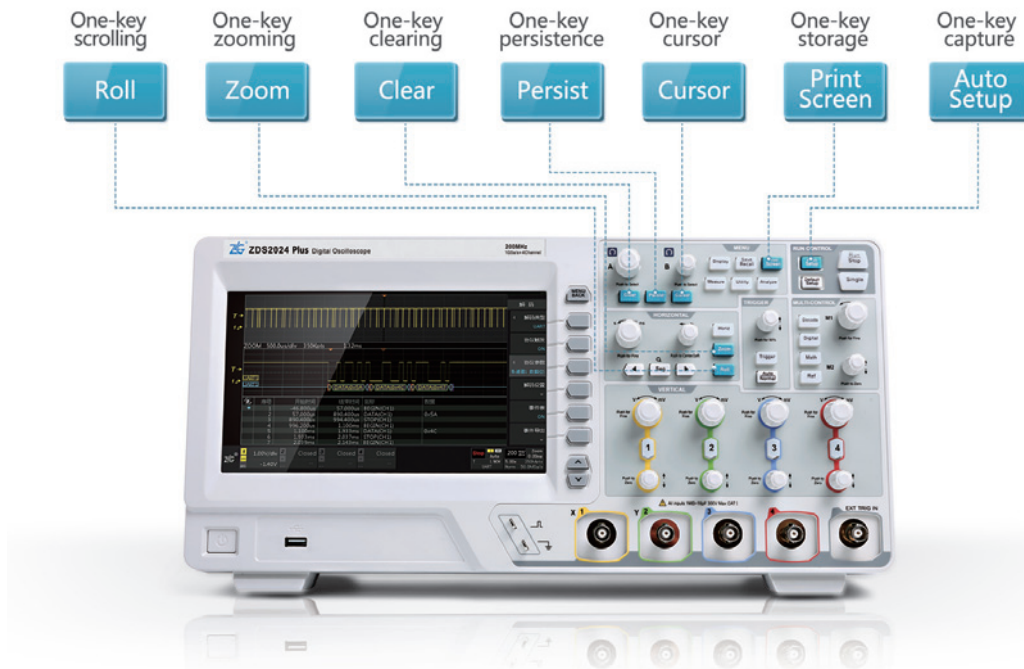
When debugging signal waveforms, we need to know whether the signal is abnormal. If so, then what about is the frequency of occurrence for an abnormal signal? Is it periodic?

To figure out these problems, we generally need to record a waveform for a long time and then determine the location where the abnormal waveform occurred based on such a big waveform database. The ZDS2024 Plus oscilloscope is able to quickly locate a signal of interest among hundreds of thousands of waveforms by relying on its advantages of mass storage and hardware acceleration. Whenever a waveform signal occurs on the current screen in accordance with search criteria, the system will automatically mark its corresponding position; therefore, the abnormal signal has no place to hide.



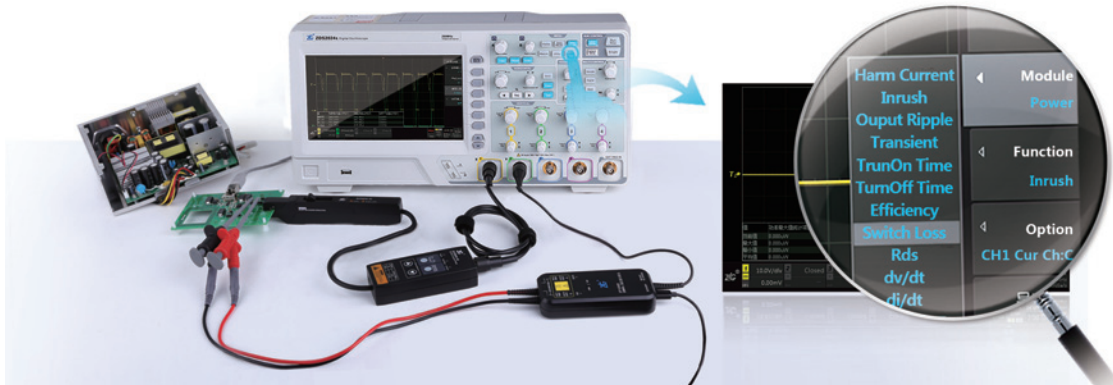
7 kinds of one-key operations

The third oscilloscope was developed in October 2012. In the course of the trial, users found it very complicated to store waveforms on USB disks. The research staff said that the oscilloscopes of other brands have done it the same way. Mr. Zhou Ligong felt disappointed and said, "If we copy others, there will be only one road to us, the road to extinction. To win, we have no choice but to be disruptive. We must realize a one-key storage somehow." He postponed the release of the oscilloscope resolutely to improve the user experience. Finally, the ZDS2024 Plus oscilloscope brings seven (7) kinds of one-key operations together, all of which are 80% of the functions used by 80% of the users in 80% of the time. Featuring coherent functions that are easy to identify and one-key operations, testing efficiency is greatly improved.



Power supply analysis software

The stability of a power supply is a lifeline closely related to the normal operation of electronic equipment. Therefore, its importance is self-evident. With rapid and diversified development of power electronic equipment, the volume, efficiency, and cost requirements for switching power supplies also improves. This is a new challenge for testing instruments and technology. Facing various power supply tests, ZHIYUAN Electronics has provided the ZDS2024 Plus with customized power supply analysis software that has a standard configuration. Furthermore, it is able to measure and analyze the operating characteristics of power supply conversion devices and circuits, including input analysis, switching element analysis, modulation analysis, and output analysis. In addition, the probe settings and measurement settings are integrated in a simple user interface. The analysis results will automatically generate a report, which is very convenient and fast.



Supports WeChat and 100 episodes of videos on practical operations

ZHIYUAN Electronics always believes that good products come from customers and ultimately serve customers. A closed loop must be formed between product and customer. We believe that the sale is definitely not the end, and we consider how to solve problems through dialogue with customers. We also consider how to receive feedback from customers in the most direct way and then give a response.

To respond to customers faster, a chat club for oscilloscope users has been created under the leadership of Mr. Zhou Ligong. Therefore, the oscilloscope group can give a prompt response for any problems raised by users. In addition, the group regularly produces videos concerning the usage of our products, tests problems of users, and offers relevant solutions, which not only allows users to know principle of testing problems, but also enables them to see the process of solving problems and relevant procedures.



Standard accessories

Accessory name	Description
Probe	Standard configuration of 1:1/10:1 250MHz passive probe for each channel
USB communication cable	Communication between PC and oscilloscope
Power line	For the power supply of an oscilloscope
Information disk	Product e-information
Warranty card	To apply for product warranty

Optional accessories

Accessory name	Description
ZP1050D	High voltage differential probe, bandwidth: 50 MHz, accuracy: $\pm 2\%$; maximum differential voltage: 1,300 V
ZP1080D	High voltage differential probe, bandwidth: 80 MHz, accuracy: $\pm 2\%$, maximum differential voltage: 1,300 V

Warranty service

Three-year warranty for host machine, which excludes probes and accessories.

★ This product has passed CE certification.

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