

How to Extract Time from Datetime Values in Excel

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How can I convert a datetime to time in Excel?

In the modern landscape of **data analysis**, managing temporal information is a fundamental skill for any professional utilizing a **spreadsheet**. **Microsoft Excel** provides robust tools for handling complex data types, but one of the most common challenges users face is the isolation of specific components within a **datetime** value. Converting a datetime to a standalone time value involves extracting the temporal segment from a cell that contains both a calendar date and a specific time of day. This procedure is essential for streamlining datasets, enhancing readability, and preparing information for granular chronological evaluation.

The necessity for this conversion arises in various professional contexts, ranging from **logistics** and supply chain management to human resources and academic research. For instance, when analyzing employee punch-in logs or server uptime reports, the specific date might be redundant if the objective is to calculate average processing times or identify peak activity periods. By stripping away the date component, users can focus entirely on the clock-based metrics, facilitating more accurate **statistical** calculations and clearer visualization in charts and graphs. **Excel** handles these values with remarkable precision, treating time as a fractional part of a 24-hour day, which allows for seamless conversion using built-in functions.

Throughout this comprehensive guide, we will explore the technical nuances of the **TEXT function** and formatting methodologies. Understanding the underlying logic of how **Microsoft Excel** stores date and time values--specifically as **floating-point numbers**--is the key to mastering these transformations. Whether you are a novice user looking to clean up a simple schedule or an advanced analyst managing vast quantities of **big data**, the following techniques will provide you with the precision and flexibility required to manipulate your time-based data with confidence and efficiency.

Understanding Excel's Internal Temporal Logic

To effectively convert **datetime** values, one must first comprehend how **Microsoft Excel** perceives time. In the **Excel** environment, dates are stored as whole numbers representing the number of days since January 1, 1900. Conversely, time is represented as a decimal fraction of a 24-hour day. For example, the value 0.5 represents 12:00 PM (noon), while 0.75 represents 6:00 PM. When a cell contains both a date and a time, it is stored as a **serial number** where the integer part is the date and the fractional part is the time. This internal system is what enables the software to perform complex **arithmetic** on temporal data.

When we "convert" a datetime to a time, we are essentially telling **Excel** to either ignore the integer portion of the serial number or to reformat the display so that only the fractional portion is visible. While simple formatting changes how the cell looks, using a formula like the **TEXT function**

actually converts the value into a **string**. This is a critical distinction in **information technology**; a string is a text-based representation, whereas a formatted number remains a mathematical value. Depending on whether you need to perform further calculations or simply present the data, your choice of method will vary.

By leveraging the **TEXT function**, users gain complete control over the output **syntax**. This function is particularly powerful because it allows for the integration of time data into larger text-based reports or labels without losing the desired format. As we delve into the specific formulas, keep in mind that the goal is to provide **data integrity** while achieving the visual clarity necessary for high-level reporting and **business intelligence** tasks.

You can use one of the following formulas to convert a datetime to a time in Excel:

Formula 1: Convert Datetime to Time with AM/PM (e.g. 2:14 AM)

=TEXT(A2, "H:MM AM/PM")

Formula 2: Convert Datetime to Time without AM/PM (e.g. 2:14)

=TEXT(A2, "H:MM")

Formula 3: Convert Datetime to Time with Hours, Minutes and Seconds (e.g. 2:14:00)

=TEXT(A2, "H:MM:SS")

Each of these formulas assumes the datetime is located in cell **A2**.

The following example shows how to use each of these formulas in practice.

Practical Implementation of Datetime Extraction

The **TEXT function** is the most reliable method for converting **datetime** values because it forces the output into a specific, immutable format. When you apply this function, **Excel** takes the numeric value from the source cell and translates it based on the **format code** provided in the second argument of the formula. This is highly beneficial when preparing data for **CSV** exports or external applications that may not recognize **Excel's** internal date formatting. By explicitly defining the structure, you ensure that the time remains consistent across different systems.

Suppose we have the following column of datetimes in Excel:

	A	B	C	D	E
1	Datetime				
2	1/1/2023 2:14 AM				
3	1/4/2023 5:19 AM				
4	2/12/2023 10:40 PM				
5	2/14/2023 8:59 AM				
6	3/1/2023 9:34 PM				
7	7/25/2023 10:13 PM				
8	10/26/2023 1:09 AM				
9	12/1/2023 12:45 PM				
10					
11					
12					
13					
14					
15					

Suppose we would like to convert each datetime in column A to only a time. This is a common requirement when dealing with **timestamps** generated by automated software or **database** queries. These timestamps often include the year, month, and day, which can clutter a report if the only relevant metric is the specific moment an event occurred. By applying our formulas, we can transform this cluttered data into a streamlined, professional list of times.

We can type the following formulas into cells **B2**, **C2** and **D2** to convert each datetime in cell **A2** to a time with a specific format:

B2: 12-hour format with an AM/PM indicator: =TEXT(A2,"H:MM AM/PM")

C2: 24-hour format (military time) for simplified tracking: =TEXT(A2,"H:MM")

D2: High-precision format including **seconds**: =TEXT(A2,"H:MM:SS")

We can then click and drag these formulas down to each remaining cell in each column. This action utilizes **standard procedures** for formula replication in **Excel**, known as "filling" the range. As the formula moves down the column, the cell reference (A2) updates relatively (to A3, A4, etc.), ensuring that each corresponding datetime is processed correctly. This **automation** is what makes **Excel** an indispensable tool for managing large datasets.

	A	B	C	D
1	Datetime	Time (AM/PM)	Time (no AM/PM)	Time (with seconds)
2	1/1/2023 2:14 AM	2:14 AM	2:14	2:14:00
3	1/4/2023 5:19 AM	5:19 AM	5:19	5:19:00
4	2/12/2023 10:40 PM	10:40 PM	22:40	22:40:00
5	2/14/2023 8:59 AM	8:59 AM	8:59	8:59:00
6	3/1/2023 9:34 PM	9:34 PM	21:34	21:34:00
7	7/25/2023 10:13 PM	10:13 PM	22:13	22:13:00
8	10/26/2023 1:09 AM	1:09 AM	1:09	1:09:00
9	12/1/2023 12:45 PM	12:45 PM	12:45	12:45:00
10				
11				
12				
13				
14				
15				
16				

Detailed Analysis of the TEXT Function Mechanics

To master the **TEXT function**, one must understand the anatomy of its arguments. The first argument is the "value," which is the numeric data you wish to format. In our example, this is the **datetime** serial number. The second argument is the "format_text," which is a **string** that tells **Excel** how to display that number. This dual-argument structure allows for immense flexibility, as you can represent the same underlying data in dozens of different ways without altering the source.

Recall the formula that we typed into cell **B2** to convert the datetime in cell **A2** to a date:

```
=TEXT(A2, "H:MM AM/PM")
```

In this specific instance, the format code "H:MM AM/PM" serves as a set of instructions for the **Excel** rendering engine. The "H" represents hours, "MM" represents minutes (with a leading zero if necessary), and "AM/PM" triggers the **12-hour clock** logic. Without the "AM/PM" suffix, **Excel** defaults to the **24-hour clock** system, which is the international standard for many scientific and industrial applications. This distinction is vital for ensuring that your data meets the specific **ISO 8601** or localized standards of your organization.

The primary benefit of this method is the total exclusion of the date. In the original **serial number**,

the date is the "whole" part of the number. By choosing a time-only format code, the **TEXT function** effectively discards the display of the integer, showing only the fractional "time" portion. However, it is important to remember that the output is now **text**. If you intend to add or subtract these times later, you might need to convert them back into numbers using the **TIMEVALUE function** or use alternative numeric formatting methods.

Utilizing Cell Formatting as an Alternative

While the **TEXT function** is excellent for creating text-based reports, sometimes you need to maintain the underlying numeric data for further **computation**. In these cases, **Graphical User Interface** (GUI) based cell formatting is the preferred route. By selecting your data and navigating to the "Format Cells" menu (Ctrl+1), you can choose the "Time" category and select from a variety of display options. This changes the visual appearance of the **datetime** without altering the actual value stored in the cell.

The advantage of using cell formatting over a formula is that **Excel** still "knows" the date is there, even if it is hidden. This allows you to perform **time-series analysis** across multiple days while only showing the hours on your dashboard. For example, if you are calculating the difference between two timestamps that span across midnight, keeping the date component is essential for accurate duration **algorithms**. If you were to use a text conversion, the "day" would be lost, potentially resulting in negative time values or errors in your calculations.

To apply custom formatting, you would use the "Custom" category in the Format Cells dialog and enter similar codes to those used in the **TEXT function**, such as "h:mm:ss". This provides a clean interface while preserving the **data type** as a number. Professionals often prefer this method when building complex **financial models** or project management timelines where the mathematical integrity of the temporal data is paramount.

Advanced Extraction Using the MOD Function

For those who need to extract the time as a true **decimal number** (the fractional part of the day) rather than a **string**, the **MOD function** is a sophisticated alternative. The MOD function returns the remainder after a number is divided by a divisor. Since **Excel** dates are integers and times are decimals, dividing a **datetime** by 1 will always return the fractional time as the remainder. The formula is simply **=MOD(A2, 1)**.

This technique is highly valued in **computer science** and data engineering because it isolates the time value mathematically. Once you have the remainder, you can format the cell as "Time" to see it in a human-readable format. This method ensures that the extracted time can be used in **mathematical optimizations**, such as calculating total hours worked or determining the median time of day for customer transactions without the interference of the date portion.

Furthermore, using the **MOD function** avoids the pitfalls of text-based conversion, such as **locale** issues. In some regions, the **TEXT function** might require different format codes (like "u" for hours instead of "h" in certain languages), whereas the **arithmetic** approach of MOD is universal. This makes your **Excel** workbooks more portable and robust when shared across international teams.

Common Use Cases for Time Extraction

The practical applications of converting **datetime** to time are vast and varied across different sectors of **industry**. In the realm of **project management**, extracting time is crucial for analyzing the duration of specific tasks. If a system logs the start and end of a process as full datetimes, extracting the time allows for a quick visual audit of whether tasks are beginning within their scheduled windows, regardless of which day they occur.

In **retail** and customer service, businesses often analyze "Time of Day" trends to optimize staffing levels. By converting transaction **timestamps** to a standard time format, managers can use **Pivot Tables** to group sales by the hour. This helps in identifying peak hours (e.g., the lunch rush or evening surge), allowing for data-driven decisions that improve customer satisfaction and operational **efficiency**.

Lastly, in **scientific research**, specifically in fields like **chronobiology** or environmental monitoring, researchers often need to align data points from different days into a single 24-hour cycle. Extracting the time from a **datetime** allows them to overlay multiple days of data on a single axis, revealing circadian rhythms or daily patterns in temperature, light, or biological activity. This conversion is a vital step in the **data preprocessing** phase of any temporal study.

Troubleshooting and Best Practices

When working with time conversion in **Microsoft Excel**, users may encounter several common issues. One frequent problem is the "Green Triangle" warning, which indicates that a number (the time) has been stored as **text**. While this is the intended result of the **TEXT function**, it can interfere with **lookup functions** or sum calculations. To resolve this, ensure you are choosing the right method (TEXT vs. MOD) based on your ultimate goal for the data.

Another consideration is the **time zone** of your source data. Many automated systems export data in **Coordinated Universal Time (UTC)**. If your analysis requires local time, you must first adjust the **datetime** by adding or subtracting the appropriate fraction of a day (e.g., subtracting 5/24 for EST) before performing the extraction. Failing to account for these offsets can lead to significant errors in reporting and **business process management**.

Finally, always double-check your format strings. A common mistake is using "MM" for both months and minutes. In **Excel's** formatting language, "m" or "mm" refers to months when used in a

date context, but refers to minutes when used immediately after an "h" or "hh" code. Maintaining **attention to detail** in your formula construction will prevent frustrating errors and ensure that your **data visualization** remains accurate and professional.

Conclusion and Mastery of Temporal Data

Mastering the conversion of **datetime** to time is more than just a formatting trick; it is a critical component of **data literacy** in the digital age. By understanding the **TEXT function**, the **MOD function**, and cell formatting options, you empower yourself to handle any **Excel** challenge with precision. These skills allow you to transform raw, messy data into clean, actionable insights that drive better decision-making in any professional environment.

As you continue to refine your **Microsoft Excel** skills, remember that the software's greatest strength lies in its flexibility. There is rarely only one way to solve a problem. By building a toolkit of different extraction methods, you can choose the one that best fits your specific workflow, whether it's for a quick visual report or a complex **database** migration. With these techniques at your disposal, you are well on your way to becoming an **expert** in temporal data management.

Note: You can find the complete documentation for the **TEXT function** in the official Microsoft Office support portal.

The following tutorials explain how to perform other common operations in Excel:

Table Creation and Management

Advanced **Conditional Formatting** Techniques

Mastering **VLOOKUP** and **XLOOKUP**

Data Cleaning using **Power Query**