# Realtel telemetry workstation user guide

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| Document type: | Software user guide (excerpt) |
| Industry: | Engineering |
| Audience: | Engineers, scientists, & technicians |

### Topics



## What is the Reltel telemetry workstation?

If you are an engineer, scientist, or technician in the field of PCM (Pulse Code Modulation) data acquisition, the Realtel telemetry workstation can help you do your job better. The workstation consists of an integrated set of hardware and software that lets you monitor PCM telemetry data in realtime, capture it for storage, and retrieve it anytime for scanning or analysis.

The Realtel telemetry workstation allows you to:

- Define a format for your PCM data, so that your decommutator recognizes it.
- Monitor realtime PCM data on the computer screen, as it comes through the decommutator.
- Capture and save PCM data, as a result of triggers you set.
- Scan captured data in various modes.
- Analyze captured data using one of the built-in mathematical processes.

## Reltel improves product design and testing

Using the Realtel telemetry workstation, you always have access to realtime telemetry data, which helps improve the design and testing of:

- Airborne systems (aircraft, rockets, missiles, satellites).
- Land-based military systems (tanks, weapons).
- Naval systems (ships, submarines).
- Automotive systems (engines, cars, trucks).
- Heavy equipment (drilling, mining, and construction machinery).

For example, when testing a new aircraft, the Realtel workstation gives you instant access to various measurands, such as the aircraft's *pitch* (how much the nose moves up and down) and its *roll* (how much the wings move up and down). You will also be able to track the status of up to 12 aircraft devices (such as whether the aircraft's main power is *on* or *off*). Since the Realtel workstation provides this information in real time, costly design errors can be reduced or even eliminated.

Before you use the workstation, certain information about each measurand—such as the channel name and channel number—are entered and saved in a format file. This information allows the Realtel workstation to interpret the PCM data it receives from the decommutator.

## Reltel monitors and captures realtime data

Monitoring realtime data is useful because you can check data as it comes through the decommutator. Through monitoring, it's easy to verify that you're receiving data on all channels, and that data is within expected ranges.

While you are monitoring realtime data, you will probably come across some that you want to study more closely—either by scanning it or analyzing it. Before doing so, however, you must set parameters for capture and temporary storage of this data. Once these parameters are set, when a trigger occurs on one or more channels, a specific amount of data is captured to memory and temporarily stored there until you turn off the workstation. Once data is captured, you may scan or analyze it from the Analysis menu.

## Reltel scans and analyzes realtime data

After capturing data, you may want to scan it. Scanning allows you to look at data carefully, at your own pace. After scanning data, you may want to analyze part of a waveform to reveal more information. You may scan and analyze two kinds of data:

- Data just captured, which is temporarily stored in memory until you turn off the workstation.
- Data previously captured and saved to the hard drive in a captured data file.

Four mathematical processes are built into the Realtel workstation to help you analyze data. These processes extract specific information from data and are useful for digital filtering and signal processing. After you select a process, the Realtel workstation applies the process to the waveform, then displays the transformed waveform on the screen:

- **Magnitude Fast Fourier Transform (MFFT)** – the waveform is transformed from the time domain to the frequency domain using the Fast Fourier Transform (FFT) process. The workstation displays the magnitude of the FFT response.

- **Power Spectral Density (PSD)** – the waveform is transformed from the time domain to the frequency domain using the FFT process. The FFT response is then squared to get the PSD response. The workstation displays PSD response.

- **Cross Power Spectral Density (CPSD)** – two waveforms are transformed from the time domain to the frequency domain using the FFT process. The FFT responses are multiplied together to see what their common frequencies are. These common frequencies yield the CPSD response. The workstation displays CPSD response.

- **Finite Impulse Response (FIR) Filter** – the waveform is transformed to simulate the behavior of analog filters—you can apply a highpass, lowpass, band-pass, or stopband filter to the waveform to accentuate or suppress certain frequencies. The workstation displays FIR Filter response.