

## Applications

- Replaces the magnetic pickup with an optical pickup using photodiodes
- MIDI Guitar Controller converts periodic analog signal into a MIDI control signal.

## Advantages

- Optical pickup allows for cleaner and more natural sound.
- Cost-effective, modular system that can be retrofitted to any commercial guitar
- MIDI Guitar Controller allows for a wider range of available sounds.
- Not susceptible to string damping, 60 Hz noise, or non-linear frequency response

## Inventors

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## Market Need

Currently, magnetic pickup of an electric guitar does not allow for the cleanest and most natural sound. Other drawbacks are string damping caused by the magnet's pull on the strings, susceptibility to 60Hz noise, and non-linear frequency response due to the inductive nature of the electromagnetic coils. Additionally, the range of available sounds is limited.

## Technology Summary

VCU inventors have created a modular device that can be retro-fitted to replace the magnetic pickup of an electric guitar with an optical pickup. This allows for a cleaner and more natural sound than that provided by current magnetic pickups and is not susceptible to the other drawbacks of magnetic pickups. This design differs from current optical pickups by using photodiodes instead of phototransistors, which allow for a linear frequency response. In contrast to current systems, it enables the analog signal to be easily converted into a digital signal. It could be also manufactured as a modular system that can be mounted on virtually any guitar with little modification.

Additionally, they have invented a Musical Instrument Digital Interface (MIDI) Guitar Controller where periodic analog signal is converted into a MIDI signal. Its advantage is a wider range of available sounds. Also, the algorithms allow for greater speed and accuracy. The controller was created using off the shelf parts and any commercial electric guitar can be outfitted with the design.

## Technology Status

Patent Pending: US and foreign rights available.

There is currently a working model for this technology.

The technology is available for licensing to industry for further development and commercialization.