



//Configurable Macro Display Pad (CMDP)

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/*Abstract*/

CMDP (Configurable Macro Display Pad) is an **HID input device** designed to simplify typing **engineering** and **math symbols** in **Windows 11**. Instead of memorizing **complex keyboard shortcuts** or searching through **extensive symbol libraries**, users can instantly type characters using **mechanical keys with built-in displays**. Unlike existing macro pads, **CMDP** is built specifically for **technical users** and features a unique **display-on-key design** that shows the function of each key. This makes it **intuitive** and **satisfying to use**, especially for those who already enjoy **mechanical keyboards**.

CMDP is a tool which combines **speed**, **clarity**, and **tactile feedback**, ultimately enhancing **productivity** in many **technical writing applications**, and beyond.

/*Summary of Results*/

The final **CMDP prototype** successfully **types and sends** all targeted character. Each **OLED display** correctly **renders** its assigned symbol, enabling quick entry of **engineering and math characters**.

A **slide potentiometer** enables “**scrolling**” **functionality**, increasing the number of **accessible characters** possible in such a **compact** and **cost-effective form factor**. This **slide potentiometer** also allows for **volume control**.

CMDP was tested during the completion of my own coursework. This **hands-on** use confirmed **CMDP's effectiveness** in improving **efficiency**, suggesting **broader uses** beyond the tested scenario.

/*Conclusion*/

CMDP simplifies complex symbol entry through a **compact, intuitive interface** combining **mechanical keys** and **dynamic displays**. It demonstrates clear **productivity gains** for **technical users**.

Further improvements could include:

- **MacOS/Linux support**
- A **PC configuration app**
- **Expanded functionality** for the **slider input**

