

# i2x™ I/O Expanders: KP, D32, R16, LCD

TERN controllers are designed to offer a rich array of I/O, but experienced embedded engineers know you can never have enough. TERN's i2x™ I/O expanders are intended to solve this problem once and for all by providing a low cost, simple, reliable, and nearly limitless expansion for TERN controllers. TERN's i2x product line adds an unprecedented degree of flexibility to your application design.

## Bus Details

TERN i2x™ I/O expansion is designed around an i2c-compatible bus. The bus is driven by only two host TTL signals: one output line acting as **clock**, and one bi-directional I/O acting as **data**. This allows a TERN controller, with its many tens of TTL I/O lines, to control numerous buses at a single time (even better since the **data** line can be shared by multiple buses). Each bus, with its integrated support for node addressing, can further support up to 16 remote node addresses used to control and communicate with remote i2x expanders.

The expanders can be addressed at a maximum rate of approximately 1 KHz; Expander I/O lines can sink up to 25 mA each, making it useful for driving LEDs, lights, or even small relays.

All remote i2x nodes must be used within 5 meters of the host controller. The i2x network consists of up to 5 physical wires: **CLK**, **GND**, **5V**, **DAT**, **INT**(optional). Each i2x expander device has the same standard 5-pin header for easy wiring.

## i2x Devices

Available i2x devices: **LCDs**, **KP**, **D32**, and **R16**. TERN provides software drivers and sample programs.

### i2x-LCD™

**TERN81S**: 8 white Segment-Digits on blue background.

These LCDs have a large font, are impressive looking and easy to use. The display text can be clearly see from 15 feet away.



### i2x-KP™

The **KP** is a simple user interface solution supporting a LCD display (16x2 character LCD by default, or 132x32 graphics LCD), and 8x2 dome keys occupying two i2x node addresses. The keys are covered by a blue color plastic overlay with clear windows, allowing the user to use custom key legends.

The optional graphics LCD can display standard 18x2 ASCII characters, or a range of Chinese/Japanese characters. Optional



7 solenoid drivers, 7 high voltage inputs, and 2 mechanical relays can be installed (requires additional i2x node addresses). The KP can be powered by 9-12V unregulated DC with on-board 5V regulator or powered with a regulated 5V DC power.

### i2x-D32™

The very small foot-print **D32** occupies four i2x node addresses, and can provide an 32 I/O lines. It also supports a character/graphics LCD. It has 14 hardware configurable high voltage I/Os, capable handling upto 30V DC.

### i2x-R16™

The **R16** can be used for driving high voltage load, signal switching and isolation. It features 16 REED relays, occupying two i2x node addresses. Each relay has two normal open contacts.

These relays are capable of far higher switching speed when compared to standard electro-mechanical relays. Each output is specified to support a maximum of 200 V, 1 Amp peak current, 0.5 Amp switching current; each output is also rated for up to 100 million switches.



## Ordering Information: Qty 1/100/1K

<b>TERN81S</b> , 8 Segment-Digits LCD .....	\$50/\$40/\$30
<b>KP-C</b> , 16x2 character LCD, 8x2 keys.....	\$79/\$49/\$29
<b>KP-G</b> , 144x32 graphic LCD, 8x2 keys .....	\$89/\$59/\$34
<b>D32</b> , 32 I/O lines.....	\$39/\$29/\$19
<b>D32-C</b> , 16x2 character LCD+16 I/Os.....	\$49/\$35/\$24
<b>D32-C20x4</b> , 20x4 character LCD+16 I/Os.....	\$69/\$45/\$29
<b>D32-G</b> , 144x32 graphic LCD+16 I/Os .....	\$59/\$45/\$32
<b>R16</b> , 16 relays .....	\$69/\$49/\$24

## Add-on options:

- 1) 14 high voltage I/O, 2 relays on **KP** ..... \$20
- 2) **i2x** cable (3 ft, 4 i2x connectors)..... \$10
- 3) **W40** (40 screw terminal-pin headers) .....
- 4) **W20** (20 screw terminal-pin headers) .....

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