

Getting Started

Kestrel 2-Digit Sign Kit

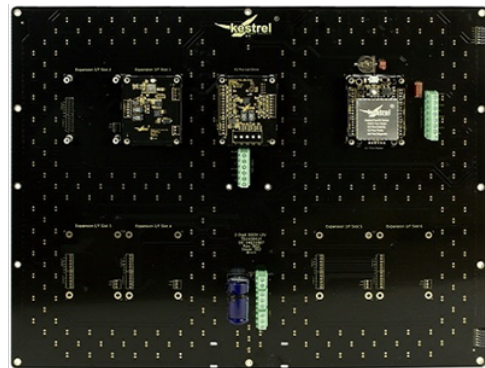
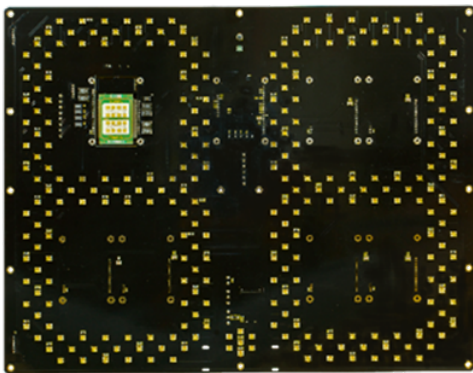


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Introduction

The Kestrel Radar 2-Digit Sign Kit is designed as an example of what can be created by using a Kestrel Radar. We have produced a simple Speed Indicator Display which is designed to be integrated into a final casing by the end user. The design is based on a plug and play architecture. This basic guide is designed as an add-on to already existing documentation. Please also have these ready to reference as needed (listed below). Our manuals are not exhaustive so please do not hesitate to contact our team for technical support or with specific queries which may be resolved with a quick email or phone call.

- K2 Pico Flex Operations Manual (All editions)
- Introduction to Kestrel Workbench (All editions)

You will need to have Kestrel Workbench installed on your PC, and have a Micro USB cable ready to connect the radar to a PC in order to operate and configure this device.

How does this Sign Kit work?

In short, this is a ready-made Speed-Indicator Display.

All that is required is a simple connection to 12V. Please use the photos below in the Making Connections section to help get you started about what wires to connect, and where.

The K2 Flex Radar, along with all other hardware supplied by Kestrel is completely flexible.

The radar that comes attached to this Sign Kit will have an Application Script pre-loaded. It has been set up to allow the 2-Digit LED Sign to Operate as a basic Speed Indicator Display. The Application Script can be completely customised if this is required. The script language used to create radar applications is called PAWN. You can have multiple applications on a single radar device and switch between them in Kestrel Workbench for different applications. An API is available from Kestrel Radar Sensors that will allow you to take full advantage of the K2 Series by controlling all aspects of hardware functionality.

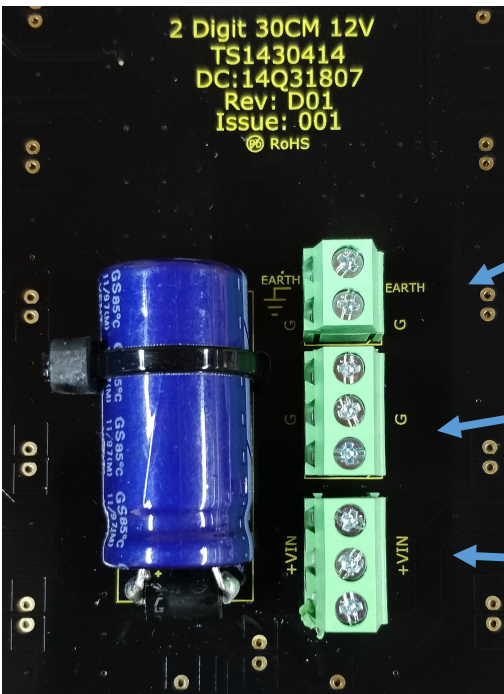
The pre-loaded application is just an example of what can be done with our 2-Digit Sign hardware. If you want to view the PAWN Project files or create your own application, please get in touch we will advise you further.

The Kestrel Sign Kit offers the following hardware:

- 4x Open Drain Outputs on the Radar
- 2x Digital Inputs on the Radar
- RS232 Serial Data output
- 2x Spare PWM outputs from the LED Segment Driver module (on the back of the sign)
- Ambient Light Sensor attached to the front of the 2-Digit Sign (for modulated display)
- Green ON LED that is not used, but could be used to flash at a given time interval (Script Controlled)
- Expansion slots for adding extra Devices from the Kestrel K2 Series

Making Connections:

Power Input Terminal Blocks

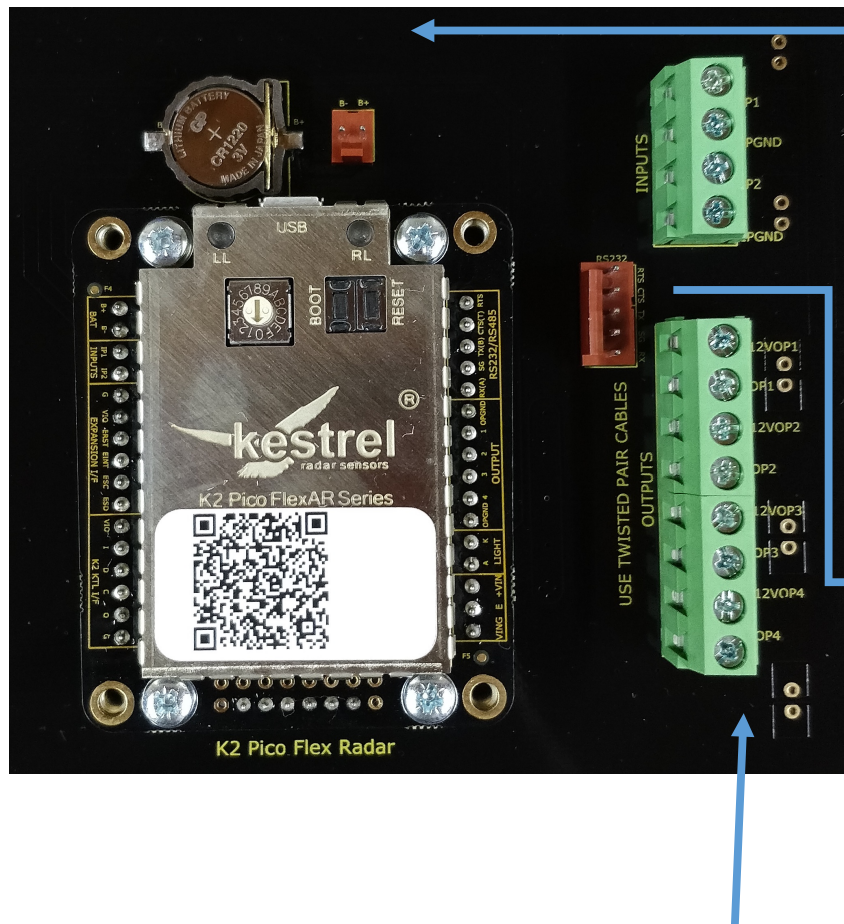


Jumper to connect the supply GND to the Chassis Earth.

Supply GND (0V) connection.

Supply +VIN (12V) connection.

Radar Connections



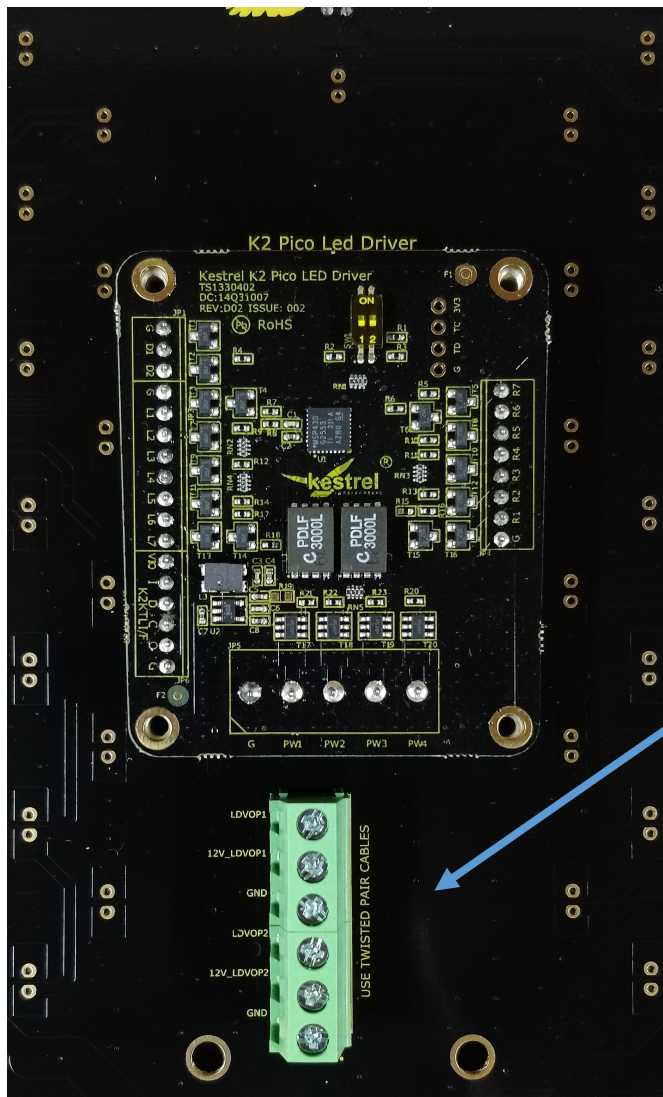
Location of Battery holder for a CR1220 3V battery. A non-rechargeable battery should be used. The connector adjacent to the battery mates with Radar battery input. The battery is only required for loggers or where Real Time Clock (RTC) functions are used.

RS232 Serial Connector to external equipment.

Four channel High current MOSFET outputs. Each Channel has 12V_OUT, SIG and GND connections. The 12V_OUT, and SIG are passed through a Common mode choke Filter. External current limit and Fuse protection is recommended for safe operation.

There are also 2-Digital Inputs, which are available via the Terminal Block above the Radar Outputs. These can be used in any number of ways, and are script controlled. The default Script does not make use of these as the functionality is undefined.

LED Driver Outputs



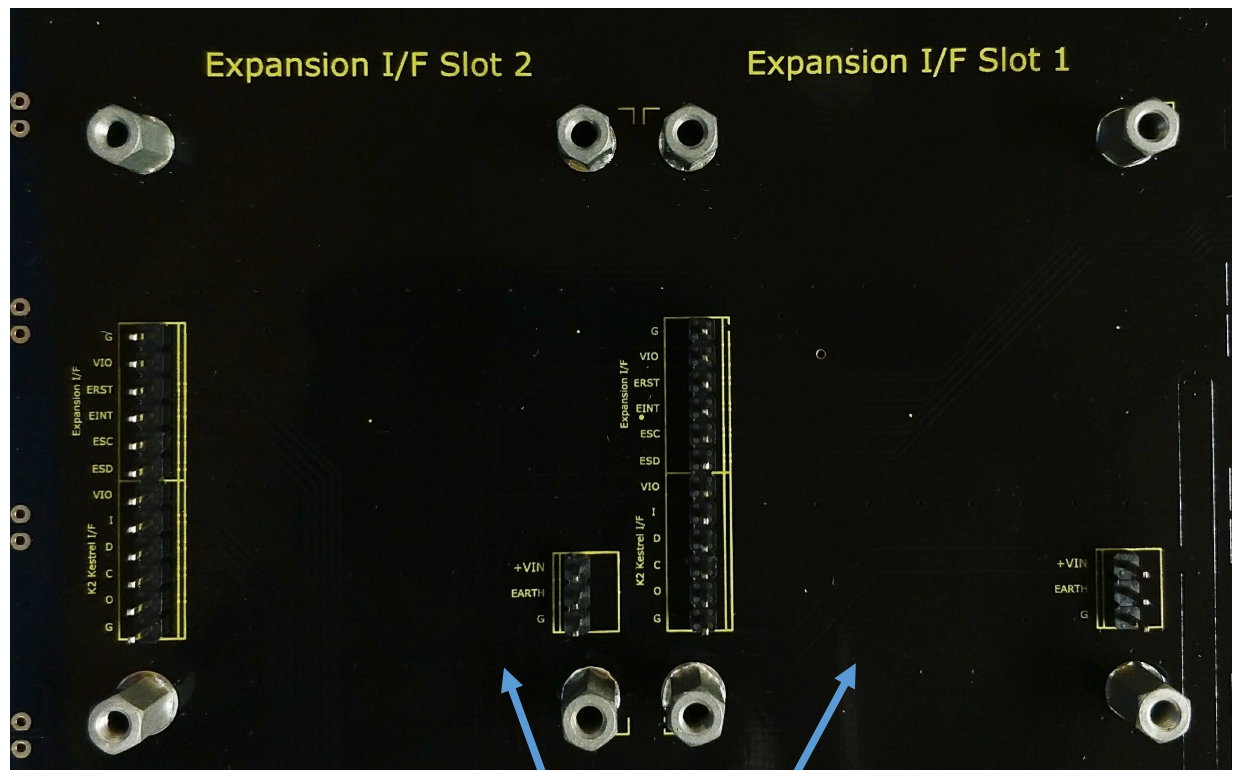
Two channel High current MOSFET outputs. Each Channel has 12V_OUT, SIG and GND connections. The 12V_OUT, and SIG are passed through a Common mode choke Filter. External current limit and Fuse protection is recommended for safe operation.

Powering Up

Connect the Sign to 12V and connect a MicroUSB Cable from the radar to your PC to configure the device using our Kestrel Workbench software tool. The radar controls the entire kit. It runs the core firmware and has the settings that will enable you to get set up for your application. Once USB is connected, Open Kestrel Workbench, and in the Devices area, expand the K2 Pico (USB) device to show the available tools.

You will see options for “Configuration”, “Data Download” and “Properties. Please refer to the “Introduction to Kestrel Workbench Guide” for more details on how the Kestrel Workbench software interface works. For more detailed guidance on radar Operation, please see the “K2 Pico Flex Operations Manual” documents. See Page 8 for more guidance on settings.

I/O Expansion Slots

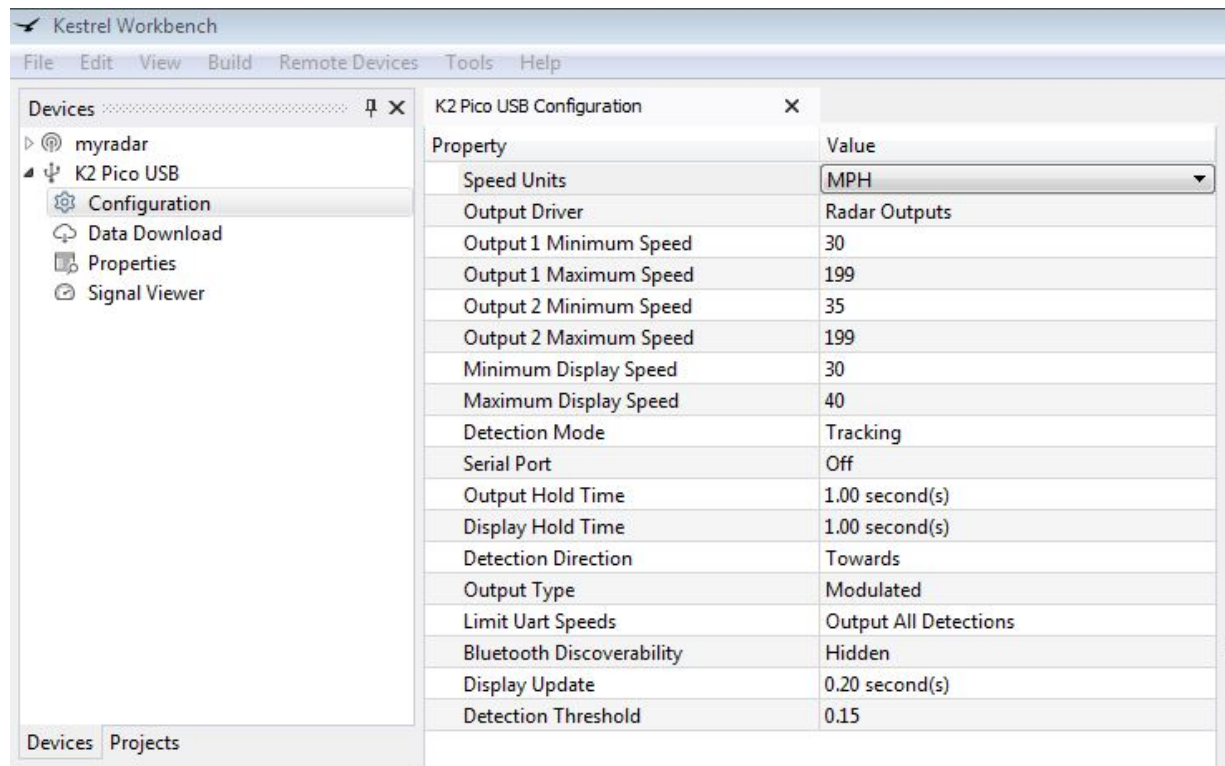


These are the Expansion Slots. Two are fitted as standard and can be used for Kestrel IO or Communications Modules. Up to 6 expansion slots are available in total, which can be added as optional extras.

The pictures above are just illustrations and serve as a general guideline as to how you should connect your devices together. Should you have further questions and/or technical requirements please do not hesitate to contact us.

Parameters – How to Configure the Sign.

Below you will see an example of the Configuration settings available on this default application.



There is also a Properties page, which contains the current active Script, and information such as Radar Serial Number, current version of Firmware, etc. The Operations Manual covers these in more detail.

Data Download will only work if you have purchased a Data Logging Radar, but will appear as a tool in all cases

In this Script (pictured above), the following Parameters are available for the User to configure how they want. Using your mouse hover over the drop down menus to show guidance on what each setting is for.

Speed Units – MPH/KPH

Outputs:

The radar can directly drive PWM outputs. The following settings relate to controlling the outputs.

Output Driver – The Sign Kit has 2 sets of outputs, 4 Open Drain outputs from the radar and 2 outputs coming from the K2 LED Driver available for use. In the default script you can select between these output locations but you can't have both. Connect your external hardware and select as the options in Kestrel Workbench as appropriate.

If you have a Kestrel Slow Down sign, please connect it to the LED Driver outputs as a 3-way linkage cable will be supplied, then select LED Driver Outputs. There is One Spare output available in this case for your own Auxiliary hardware. If you would like to write a custom script for you please get in touch and we will advise you further.

Output 1 Minimum Speed – Output 1 will be activated above this speed only

Output 1 Maximum Speed – Output 1 will stop activating if a detected speed is higher than this (to Stop people racing the sign)

Output 2 Minimum Speed - Output 2 will be activated above this speed only

Output 2 Maximum Speed - Output 2 will stop activating if a detected speed is higher than this (to Stop people racing the sign)

Minimum Display Speed – Set the speed at which you would like the 2-Digit Sign to start displaying the speed of the vehicle.

Maximum Display Speed – 2-Digit Sign will stop activating at this Speed

Detection Mode – Tracking Mode should be enabled to ensure best performance. For certain applications, this setting can be changed but we recommend leaving it in this mode.

Serial Port – If you make use of RS232, select the desired speed of output

Output Hold Time – Select the time period for which the Outputs remain Active after a detection event occurs.

Display Hold Time - Select the time period for which the 2-Digit Display remains Active after a detection event occurs.

Detection Direction – The radar can measure Towards, Away or Bi-Directional Traffic

Output Type – Mounted on the 2-Digit Display is a Vishay TEMD Light Sensor which can read in the light levels. If the “Modulated” Option is selected, the LEDs will activate and will modulate according to the light levels. You can use Kestrel Workbench to create your own calibrations to set your own curve for read in Values vs. Brightness. Alternatively, please select On/Off if you want to activate the sign with full power regardless of ambient light conditions.

Limit Uart Speeds – This setting concerns the Serial Port and how it is used. If the RS232 Data port is used, you can change the output between “Above Minimum Speed” or “Output All Detections”. Further settings can be created if you customise the output with Scripting, The output is ASCII text.

BlueTooth Discoverability – If you have a BlueTooth module, this setting by default should be set to Always Discoverable but you can also select the other options to save power.

Detection Threshold – Changes the sensitivity of the sensor – a larger target will be required to activate the sign if you change this value to a higher number. The 100m radar is set to a default value is 0.15, and the 200m radar should be set to 0.25-30. This setting reduces the sensitivity of the radar to noise in the environment.

Mechanical Information

