

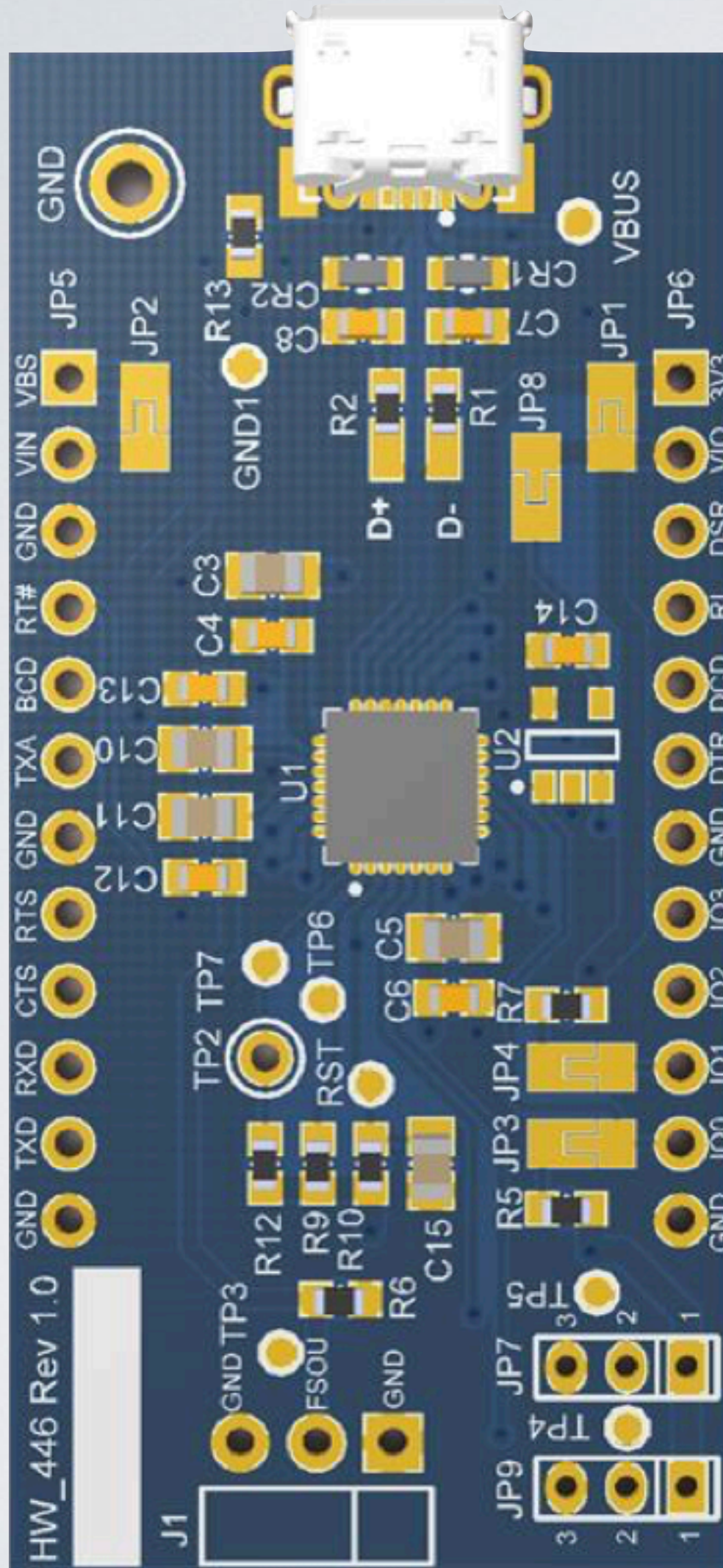
PRIME CONNECT+

Mark Power



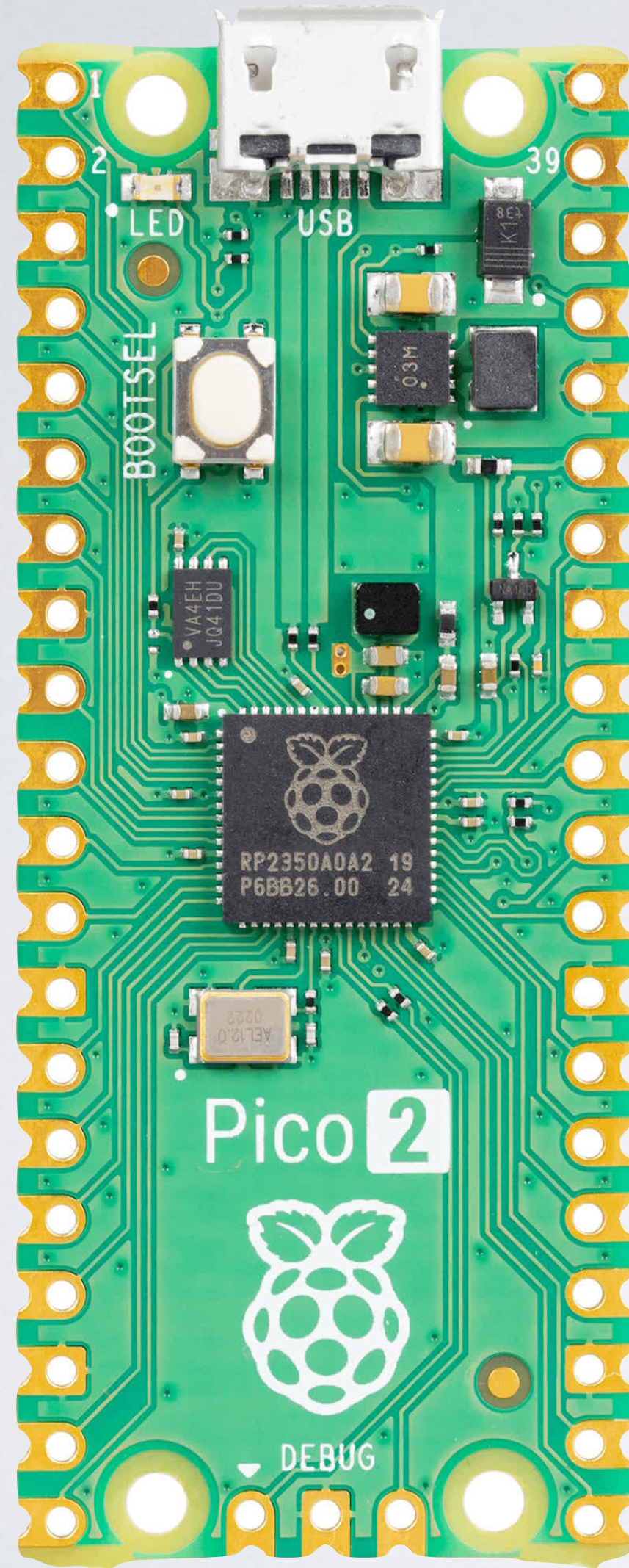
HP PRIME TO USB DEVICES

- HP Prime firmware includes:
- USBOpen() returns a list of connected USB-HID devices
- USBOpen(vid, pid) opens a specific device and returns a list of the output and input report lengths
- USBSend({data}) sends one USB packet of data
- USBRecv() returns a list of data items



2023 - FT260

- I2C to connect to sensors
- Unable to configure UART from Prime
- Relatively expensive (£15)
- All software must run on the Prime
- Used for environmental sensing, tilt detection, waveform generation and eclipse monitoring

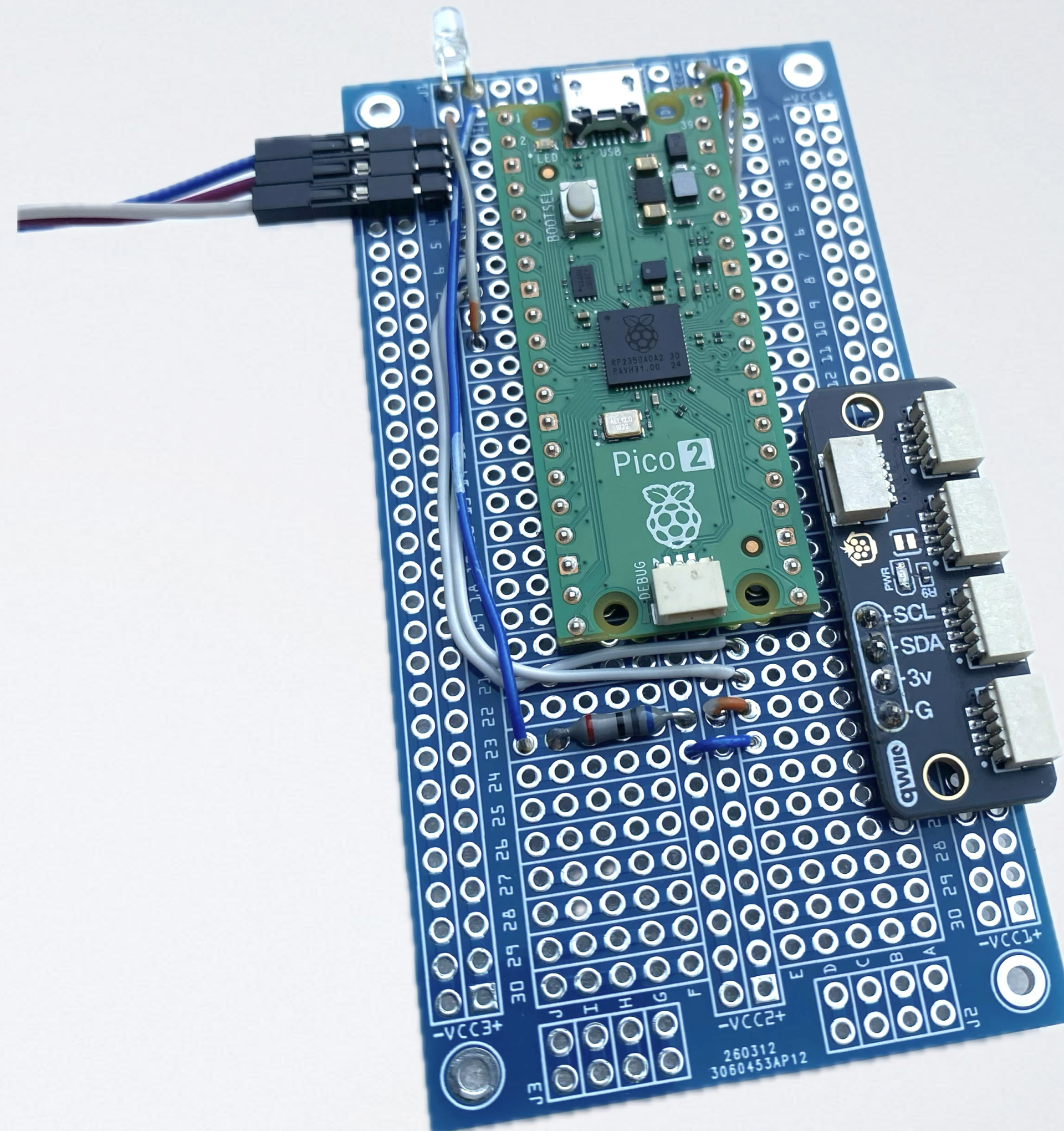


2026 - PICO 2

- I2C to connect to sensors
- UART configurable from Prime and Pico
- IR support with a IR LED and resistor
- Cheap (£5)
- Software can be developed on Prime / Pico
- Pico SDK and AI to aid development
- Upgradeable to add new features

PROTOTYPE FEATURES

- QWIIC connectors for multiple I2C devices
- Rx/Tx/Gnd UART pins for conversion to RS232 or USB
- IR printing to HP82240B



PICO LIBRARY COMMANDS

- `Pico.Open()` establishes comms to the Pico
- `Pico.Send(cmd)` sends a command string to the Pico and returns a status message or data
- `Version()` sends “V” and returns the software version
- `LedOn()/LedOff()` sends “L” or “O” appropriately

PICO UART COMMANDS

- SetBaudRate(baud) for UART sends “U *baud*”
- SendUart(string or list of bytes) sends “S msg” to UART
- ReceiveUartBytes() sends “R” and returns a list of bytes
- Accompanying ANSI terminal app for the Prime

PICO I2C COMMANDS

- ScanI2C() sends “Q” and returns a list of connected device addresses
- SetRegs(device, {reg1, val, reg2, val, ...}) sends “I dev data” to the device address or registered device by name
- GetRegs(device, {reg1, reg2, reg3, ...}) sends “J dev data” to device and returns a list of bytes one per register
- Send “K dev data” directly to control devices

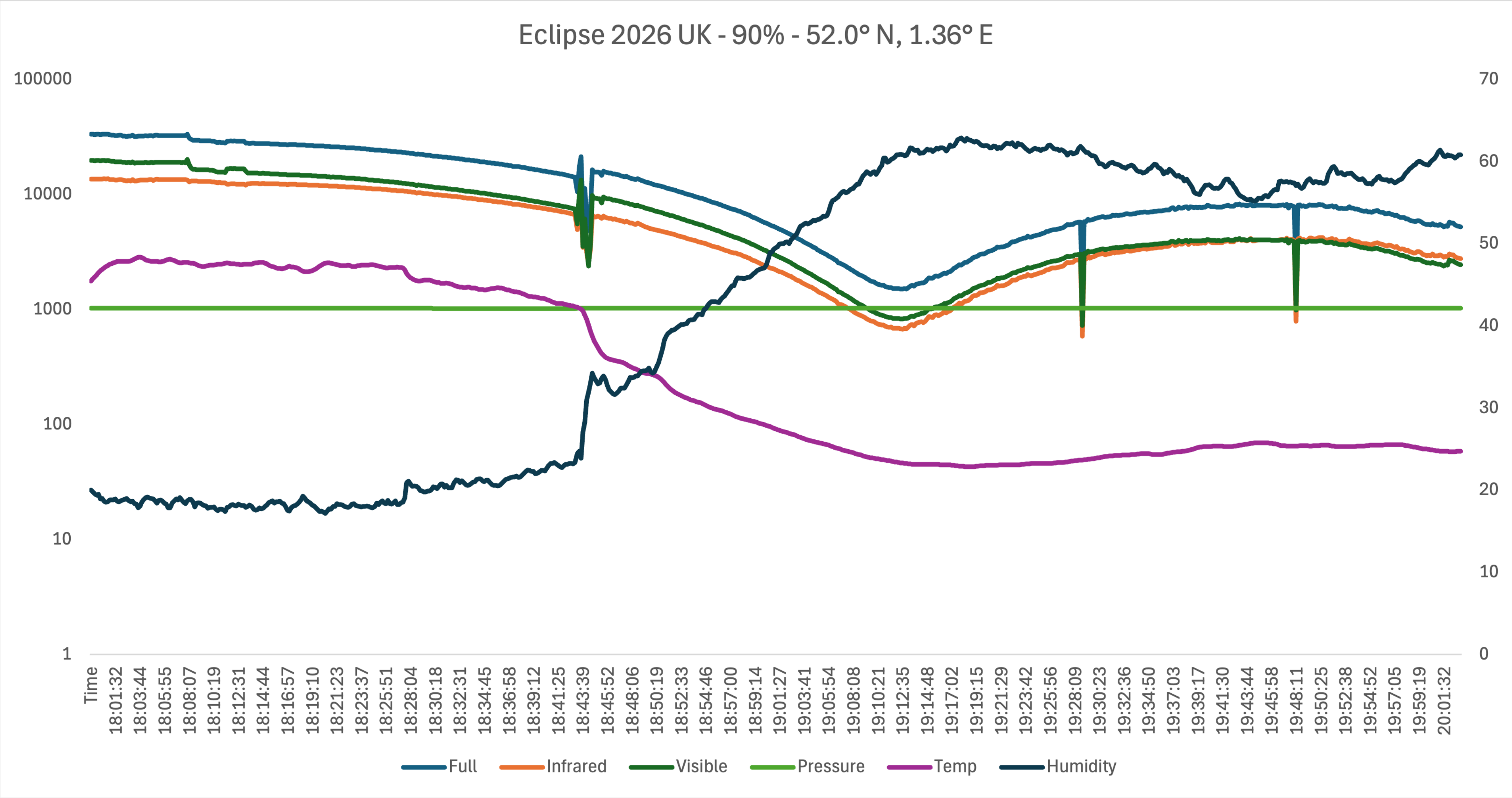
MORE I2C COMMANDS

- Manufacturer C code on the Pico for devices replaces code on the Prime e.g. BME68x
- Configure the BME68x sensor by sending “M bme68x {gas_en,heater_ms_h,heater_ms_l,heater_temp_h,heater_temp_l,filter,osr_hum,osr_temp}”
- Read calibrated BME68x sensor data “N bme68x” which returns {temperature, pressure, humidity, gas resistance}

IR PRINTING

- P <text>: Send plain text bytes over IR using HP 82240B byte-frame LUT encoding (quotes are not required)
- P {b1,b2,...}: If the first parameter character is {, parse explicit decimal byte values (0-255), including 0/null bytes
- T: Send a fixed HP 82240B IR self-test line (HP82240B SELF-TEST OK) followed by newline

ECLIPSE APP



FINALLY

Available at <https://github.com/mpjpower/hid-pico-a>

