UART protocol and device assembly

For our project we are using the following devices:

- Raspberry Pi Pico H
- Fasizi v2.0 5V wireless quad-band GSM unit and transmitter
- Grove GPS air530
- External power source (battery box or bench supply)

UART protocol

UART protocol stands for Universal Asynchronous Receiver-Transmitter, and is designed to allow devices to communicate over a single connection without having to maintain a synchronised clock rate, so long as they share a uniform data transmission speed (known as baud rate, and referred to as such henceforth).

The Receiver-Transmitter part of the name comes from the fact that transmitters are connected to receivers, and vice versa.

The raspberry Pi Pico H has the capability to operate with 2 UART devices at any given time. UART 0 makes use of GPIO (General-Purpose Input/Output) pins 0 and 1 (physical pins1 and 2), and UART 1 makes use of GPIO pins 4 and 5 (physical pins 6 and 7 respectively).

Device connections

Whilst there is no difference in the order of connecting the devices, for the purpose of ease of physical layout the GSM module will be attached to UART 1 and the GPS unit attached to UART 0.

UART 0:

TX pin: GPIO 0 (Physical pin 1)
RX pin: GPIO 1 (Physical pin 2)
Closest ground: Physical pin 3

Connected device: GPS unit

Baud rate: 9600

UART 1:

TX pin: GPIO 4 (Physical pin 6)
RX pin: GPIO 5 (Physical pin 7)
Closest ground: Physical pin 8

Connected device: GSM unit

Baud rate: Undetermined

Sources:

Campbell, Scott. 2016. "Basics of UART Communication." Circuit Basics. February 13, 2016.
        https://www.circuitbasics.com/basics-uart-communication/.

Pena, Eric, and Mary Grace Legaspi. 2024. "UART: A Hardware Communication Protocol Understanding Universal Asynchronous Receiver/Transmitter | Analog Devices." Analog.com. 2024. https://www.analog.com/en/resources/analog-dialogue/articles/uart-a-hardware-communication-protocol.html.