

Add Connectivity to Existing Hardware with Our UART to Wi-Fi Bridge



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I am sure this has happened to many of you: One morning, the engineering manager comes to you and says, “we need to add Wi-Fi® capability to product ‘x’, but I don’t want the circuit in product ‘x’ changed in order to add the capability.” If the existing system already has a universal asynchronous receiver/transmitter (UART) connection to a host processor, Wi-Fi capability can easily be added.

TI has created a reference design for a [UART to Wi-Fi Bridge with 24 VAC Power \(TIDA-00375\)](#) that is targeted for use in building automation and HVAC systems. This design features a low-power [SimpleLink™ Wi-Fi CC3200 wireless MCU](#) to enable Internet connectivity. This design also includes a power supply section that can be used with 24 volt AC systems found in HVAC applications and thermostats. The design can be interfaced to systems with either 3.3 volt or 5 volt logic.

The TIDA-00375 reference design is presented as a wireless bridge. (See [Figure 1](#)) The software included in the design creates a connection between two TIDA-00375 boards using a Wi-Fi connection provided by an external access point. Bidirectional communication is provided. The UART communications between the existing system hardware nodes appear as if a cable is connected between the two UARTs.



Figure 1. Wireless bridge over an existing Wi-Fi network

While this method is documented in the reference design, it is by no means the only use for this hardware. If no existing network is available, one of the two TIDA-00375 boards can be configured as an access point and the other board can then be connected to this network. Communications between the end systems would again appear as if the two systems were connected by a cable. This is shown in [Figure 2](#).

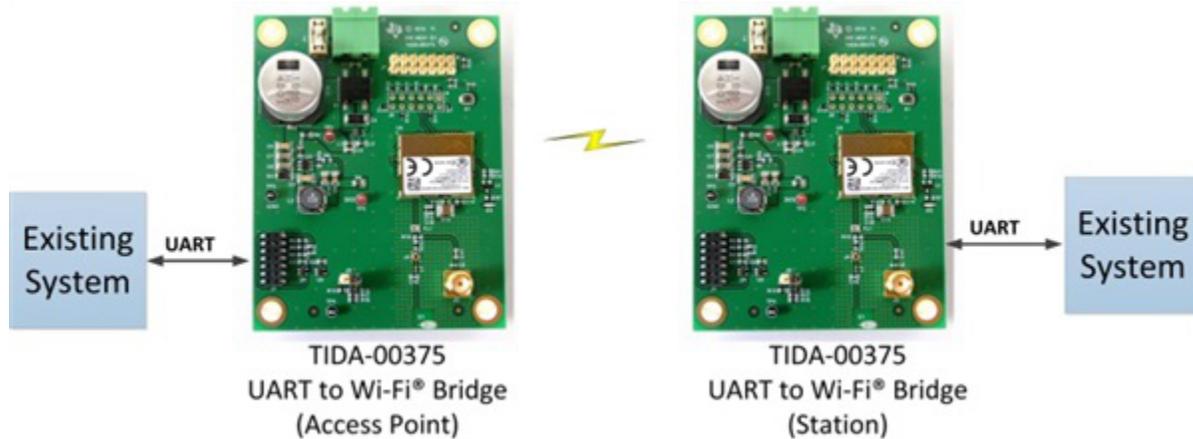


Figure 2. Wireless bridge using one TIDA-00375 as an access point

Figure 3 shows a third possibility. In this configuration, one TIDA-00375 board is connected to an access point that has Internet access. Communication from the existing system can be sent to a cloud location on the Internet for remote monitoring of data, data analysis or even system control.



Figure 3. Wireless data connection to the cloud

In addition to the HVAC and thermostat applications, there are many other possible applications for this design in building automation and factory automation. So, next time you are tasked with connecting existing hardware to Wi-Fi, remember our wireless bridge designs and the SimpleLink Wi-Fi CC3200 platform can help make the process easier. Let us know how you will use this reference design.

Additional Resources:

- Download the [UART to Wi-Fi Bridge with 24 VAC Power \(TIDA-00375\)](#) reference design for design guide, schematics, test data, design files, bill of materials and more
- For a design with an RS-485 interface, see TI Designs [TIDA-00485](#) and [TIDA-0486](#) for non-isolated and isolated RS-485 to Wi-Fi Bridge with 24 VAC Power. These can also communicate with TIDA-00375 to provide cable replacement

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