

HM-10 Services and Characteristics

BLE is all about services and characteristics and like all BLE devices, the HM-10 has a set of services and each service has a set of related characteristics. Characteristics are where the values are, some are READ, some are WRITE, and some are READ and WRITE.

All the services on the HM-10 are predefined except one. This is a custom service that has one custom characteristic. Predefined services and characteristics are ones where the UUID and the name are set by the Bluetooth governing body. For example, the characteristic 0x2A00 is the device name and when a device has this characteristic it should always be the device name.

A full list of the predefined services can be found [here](#) and a list of the characteristics is [here](#).

The HM-10 uses the custom characteristic to send and receive the data it receives over the serial UART interface. It works by setting the value of the custom characteristic to the value of the data to be transmitted. It then sends out a notification to the remote device to say there is new data available.

When you tell the the HM-10 to transmit "HELLO", it first sets the value of the custom characteristic to "HELLO" and then it sends out a notification telling the remote device "Hey, I have new data, come and get it." The remote device is scanning for the notifications and when it receives one it knows there is a new value, so it reads the data and then sends back a message saying "Thanks, I have it".

The custom characteristic can hold up to 20 characters, this means to send a string longer than 20 characters the HM-10 splits the data in to 20 character segments and sends each one in turn until none are left.

SERVICE 1

UUID: 00001800-0000-1000-8000-00805F9B34FB

GENERIC ACCESS

- UUID: 00002A00-0000-1000-8000-00805F9B34FB
- DEVICE NAME
- READ
- UUID: 00002A01-0000-1000-8000-00805F9B34FB
- APPEARANCE
- READ
- UUID: 00002A02-0000-1000-8000-00805F9B34FB
- PERIPHERAL PRIVACY FLAG
- READ/WRITE
- UUID: 00002A03-0000-1000-8000-00805F9B34FB
- RECONNECTION ADDRESS
- READ/WRITE
- UUID: 00002A04-0000-1000-8000-00805F9B34FB
- PERIPHERAL PREFERRED CONNECTION PARAMETERS
- READ

SERVICE 2

UUID: 00001801-0000-1000-8000-00805F9B34FB

GENERIC ATTRIBUTE

- UUID: 00002A05-0000-1000-8000-00805F9B34FB
- SERVICE CHANGED
- INDICATE

SERVICE 3

UUID: 0000FFE0-0000-1000-8000-00805F9B34FB

CUSTOM SERVICE

- UUID: 0000FFE1-0000-1000-8000-00805F9B34FB
- CUSTOM CHARACTERISTIC
- READ/WRITE/NOTIFY

The main part of the custom service UUID (FFE0) the main part of the custom characteristic UUID (FFE1) can be changed via AT commands. A second characteristic can also be added.