CLAIMS

WHAT IS CLAIMED IS:

1. A non-transitory computer-readable medium storing instructions that, when executed, causes a processor to perform operations, comprising:

receiving at a field tool, a challenge message from an advertising device via a Bluetooth low-energy (BLE) advertisement message, the challenge message including a challenge;

calculating, based at least in part on the challenge, a challenge key and a secure hash algorithm (SHA), a response solution;

sending the response solution to the advertising device; and

receiving from the advertising device a confirmation message indicating that the response solution is verified as correct,

wherein the challenge key is calculated using the SHA based at least in part on inputs known to the advertising device and the field tool, the challenge key further including a fixed value, and

wherein the fixed value is specific to a manufacturer of the advertising device and known to the field tool and the advertising device.

2. The non-transitory computer-readable medium of claim 1, the operations further comprising:

receiving from the advertising device a directed advertising message to a Bluetooth device address (BDA) of the field tool based at least in part on the response solution being verified by the advertising device; and

pairing to the advertising device based at least in part on receiving the directed advertising message.

3. The non-transitory computer-readable medium of claim 1, wherein the advertising device is a battery-powered device (BPD).

4. The non-transitory computer-readable medium of claim 1, the operations further comprising activating a scan mode of the field tool to detect the BLE advertisement message from the advertising device.

5. The non-transitory computer-readable medium of claim 1, the operations further comprising adding the advertising device to a device list stored in memory accessible by the field tool.

6. The non-transitory computer-readable medium of claim 1, wherein the response solution includes a hash-based message authentication code (HMAC).

7. A method of pairing a battery-powered device (BPD) with a field tool, the method comprising:

with the BPD and over a Bluetooth low-energy (BLE) network:

generating a challenge message, the challenge message including a challenge;

issuing the challenge message in a scannable undirected advertising message;

receiving from the field tool a response solution to the challenge message, the response solution being calculated based at least in part on the challenge and a challenge key associated with the challenge; and

verifying the response solution based at least in part on a secure hash algorithm (SHA),

wherein the challenge key is calculated using the SHA using inputs known to the BPD and the field tool, the challenge key further including a fixed value, and

the fixed value being specific to a manufacturer of the BPD and known to the field tool and the BPD.

8. The method of claim 7, further comprising broadcasting an advertisement of the BPD.

9. The method of claim 8, further comprising based at least in part on the response solution being verified, adding the field tool to a device list stored in memory accessible by the BPD.

10. The method of claim 8, wherein the advertisement is broadcast based at least in part on instructions received from a headend device, an indication that communication with the headend device is lost, or combinations thereof.

11. The method of claim 7, further comprising:

sending a confirmation message to the field tool indicating that the response solution is verified as correct; and

sending a directed advertising message to a Bluetooth device address (BDA) of the field tool based at least in part on the response solution being verified, the directed advertising message including a BDA of the BPD.

12. The method of claim 11, further comprising:

receiving a connection request from the field tool based on the directed advertising message sent to the BDA of the field tool;

verifying the BDA of the field tool; and

based on the verifying of the BDA of the field tool, pairing the BPD and the field tool.

13. The method of claim 7, wherein the response solution includes a hash-based message authentication code (HMAC).

14. A field tool comprising:

a processor; and

a non-transitory computer-readable media storing instructions that, when executed by the processor, causes the processor to perform operations comprising:

receiving at the field tool, a challenge message from an advertising device via a Bluetooth low-energy (BLE) advertisement message, the challenge message including a challenge;

calculating, based at least in part on the challenge, a challenge key and a secure hash algorithm (SHA), a response solution;

sending the response solution to the advertising device; and

receiving from the advertising device a confirmation message indicating that the response solution is verified as correct,

wherein the challenge key is calculated using the SHA using inputs known to the advertising device and the field tool, the challenge key further including a fixed value, and

wherein the fixed value is specific to a manufacturer of the advertising device and known to the field tool and the advertising device.

15. The field tool of claim 14, the operations further comprising:

receiving from the advertising device a directed advertising message to a Bluetooth device address (BDA) of the field tool based at least in part on the response solution being verified by the advertising device; and

pairing to the advertising device based at least in part on receiving the directed advertising message.

16. The field tool of claim 14, wherein the challenge key includes the SHA using inputs known to the advertising device and the field tool.

17. The field tool of claim 14, wherein the advertising device is a battery-powered device (BPD).

18. The field tool of claim 14, the operations further comprising activating a scan mode of the field tool to detect the BLE advertisement message from the advertising device.

19. The field tool of claim 14, the operations further comprising adding the advertising device to a device list stored in memory accessible by the field tool.

20. The field tool of claim 14, wherein the response solution includes a hash-based message authentication code (HMAC).