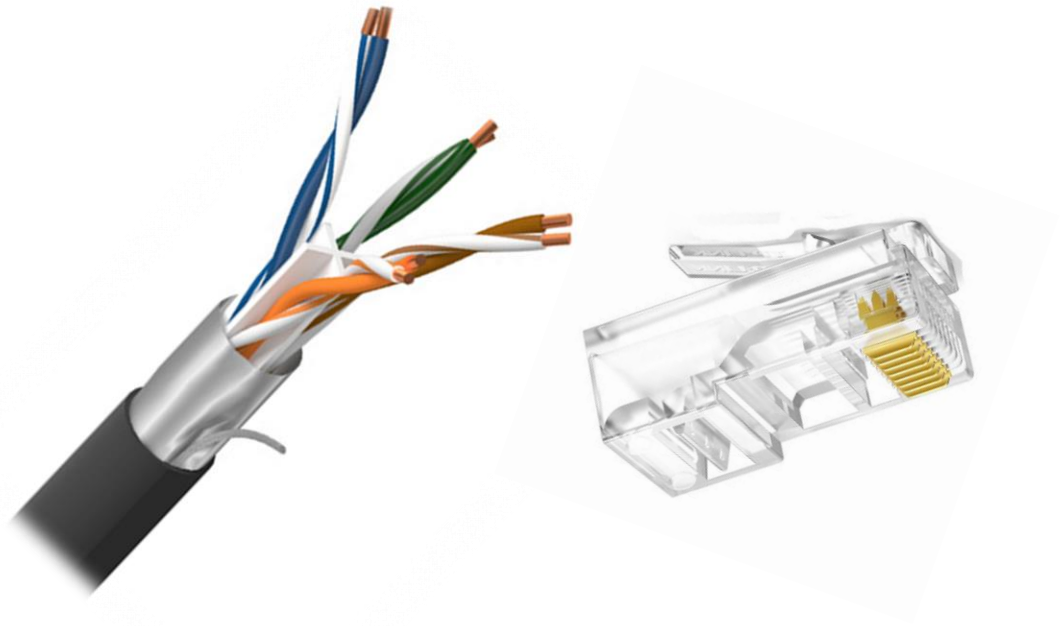
Communications Cable Preparation



Overview

It may be necessary to create a communications cable on-site. This work instruction outlines the steps for preparing, terminating, and testing a communications cable between the aGate and the aPower batteries or the aGate and the homeowner's network router. The cable is essential for communication between FHP components and shall be constructed according to the guidelines provided in this work instruction.

For information regarding CAN input and output locations and Ethernet communication configuration, please refer to the FranklinWH System Installation Guide.

Work Instruction details include:

- Cable preparation
- Installing the RJ45 connector
- Communications cable inspection and testing

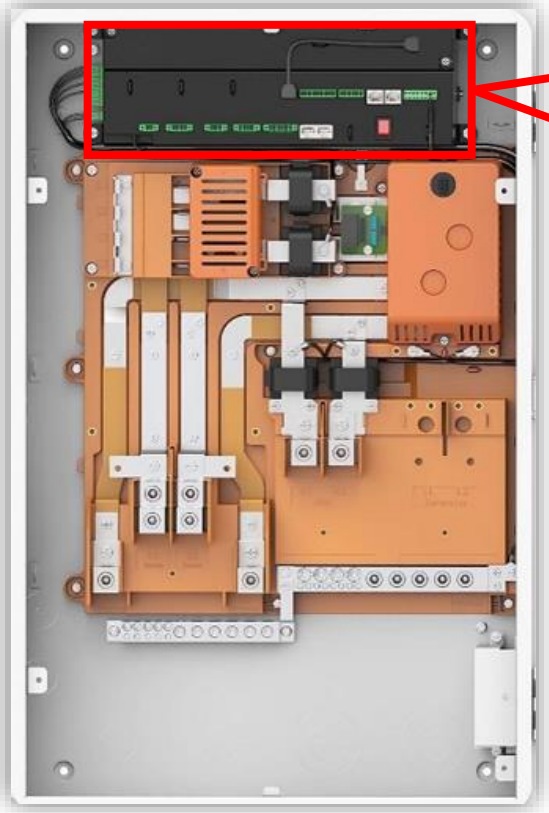
Tools And Materials

Estimated Time	• 5 minutes per RJ45 connector
Materials	• Belden CAT5 or CAT6 shielded communications cable (CAT6 recommended) • Pass-Thru style communication connectors
Tools	• RJ45 Pass-Thru crimping tool • RJ45 connection tester • Radial communications cable stripper

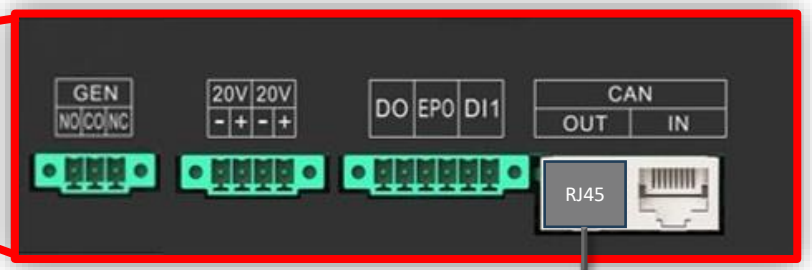
IMPORTANT: When installing communications cables in conduit with other conductors, verify that the cable used is Type 600V TC insulated and shielded.

FranklinWH Communications Cable

Proper use of CAN communications is necessary during the installation of the Franklin Home Power system. The aGate controller and aPower batteries must be connected using a communications cable, which can also connect the aGate with a network router or additional aPower batteries if needed. Ensuring the cable is prepared and installed correctly is crucial to avoid FHP functionality issues. Failure to do so could result in the aPower being unable to send or receive charge and discharge commands from the aGate or damage to the EMS Module.



aGate



aGate EMS Module

aGate – aPower CAN Communications Connection Cable

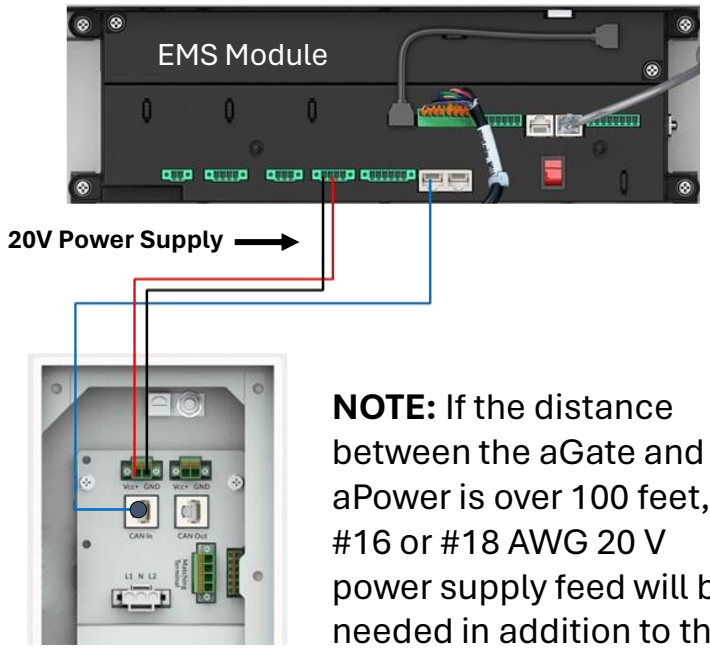
aPower Wiring Compartment (Optional Multiple aPowers Pictured)

Step 1 – Cable Preparation

Trimming The Cable To Length

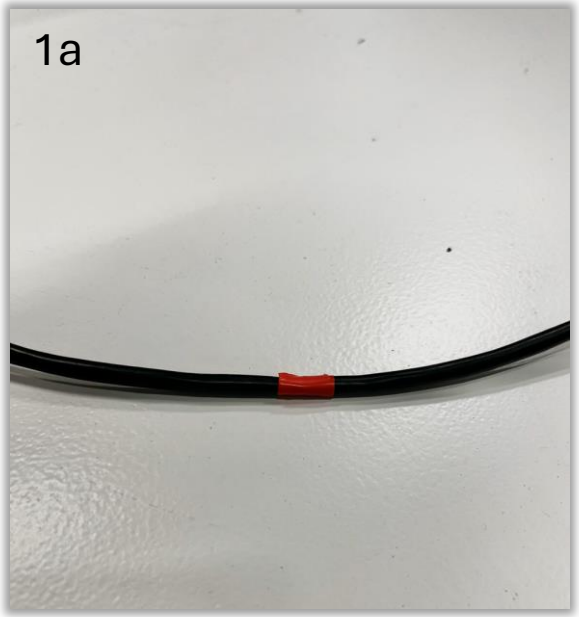
IMPORTANT: To avoid FHP equipment damage, verify that the communications cable is completely disconnected from all sources before cutting or terminating.

Pro Tip: If applicable, it is best practice to pull the cable through any conduit before installing the RJ45 connectors. A terminated communications cable will be difficult to pull through a conduit with other conductors and may damage the RJ45.



aPower

NOTE: If the distance between the aGate and aPower is over 100 feet, a #16 or #18 AWG 20 V power supply feed will be needed in addition to the communications cable.



After determining the communications cable length, mark with tape or a pen.

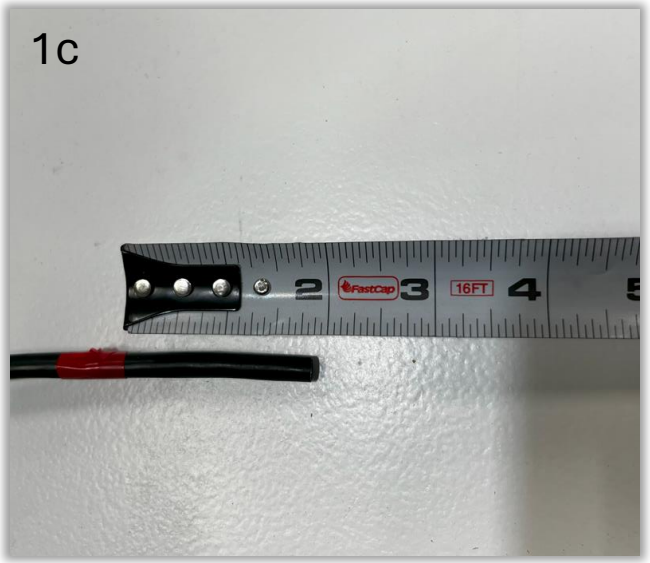
Once marked, cut the cable.
In this example photo, a Klein Pass-Thru VDV226-110 modular crimper is being used.

Step 1 Continued – Cable Preparation

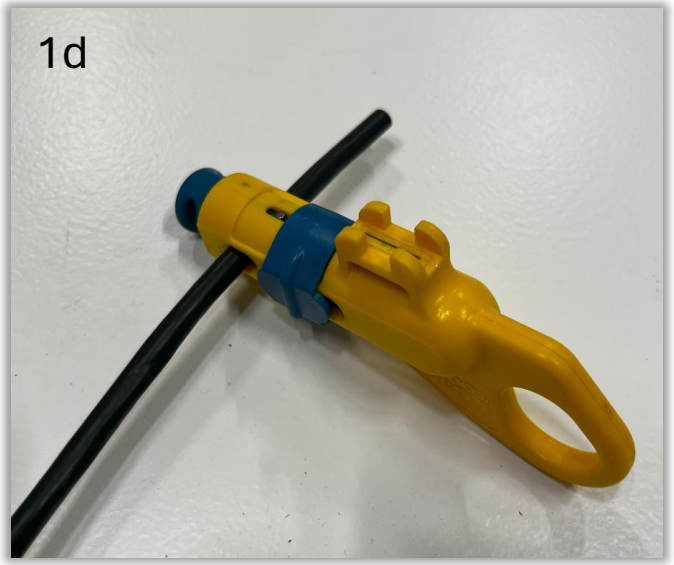
Stripping The Outer Jacket

NOTE: If the communications cable being terminated contains drain wire, it can be removed along with the jacket.

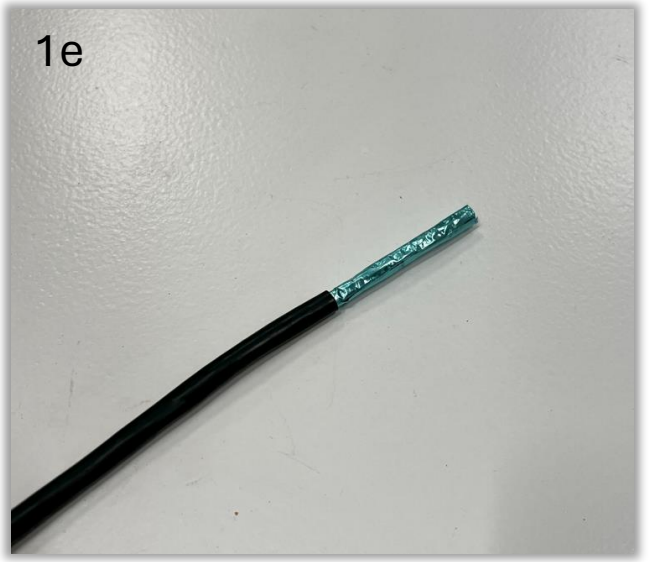
IMPORTANT: Avoid cutting into the cable conductors when scoring the outer jacket. If the cable conductors are cut or nicked, cut the end of the cable clear and start over. Always inspect conductors for damage before termination.



Measure 1.5” to 2” from the cable end and mark.



Score the cable jacket at the mark. In this example photo, a Klein VDV110-295 radial stripper is being used.



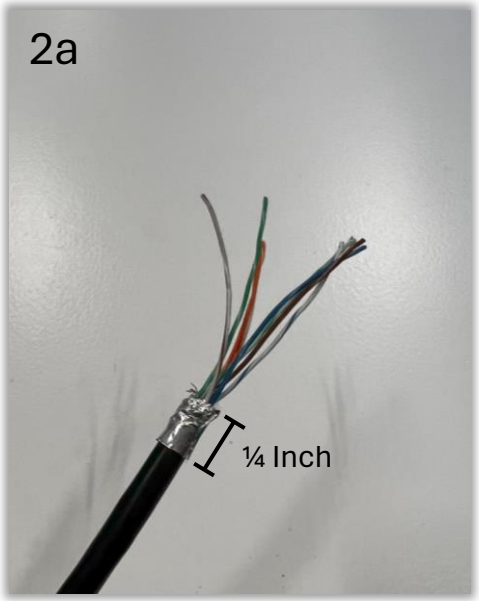
Once scored, remove the cable jacket to expose the foil shield.

Step 2 – Conductor Preparation

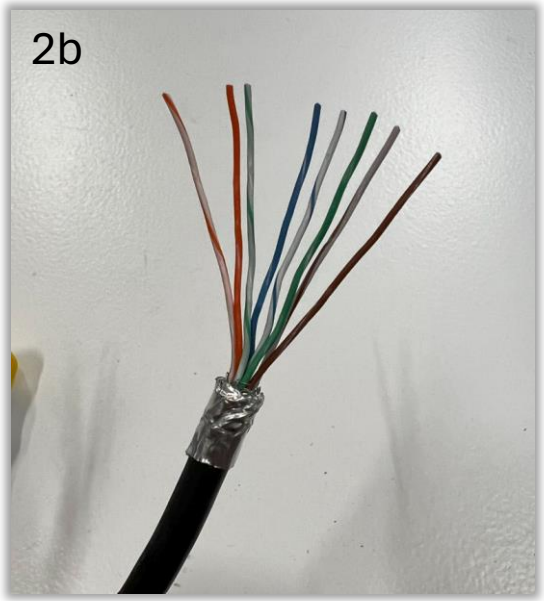
Separate The Conductors

IMPORTANT: The 568B standard configuration shall be followed when making CAN communications cables for FHP equipment.

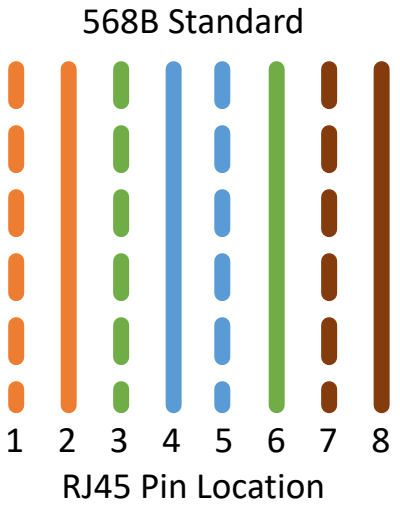
Pro Tip: Most modular crimping tools have the 568B wiring diagram enclosed with the tool instructions, printed on the tool, or available for download.



After removing the cable jacket, separate the conductors and trim the foil shield to a ¼ inch.



After separating the conductors, align them to match the 568B standard sequence. Wrap the foil shield around the cable.

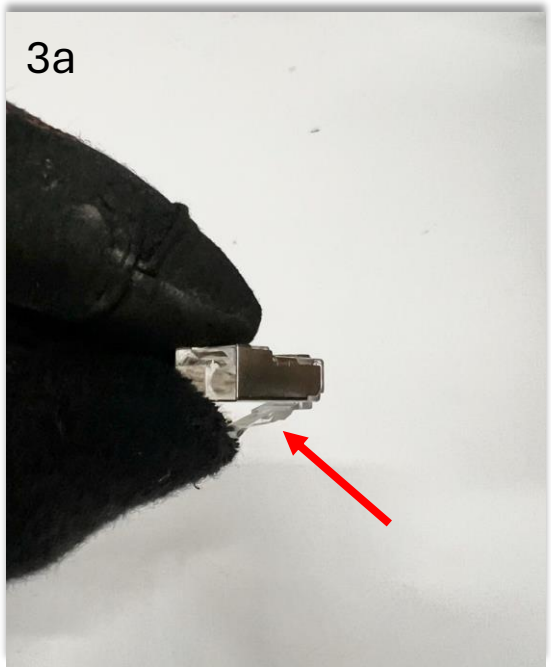


Pin 1 White-Orange
Pin 2 Orange
Pin 3 White-Green
Pin 4 Blue
Pin 5 White-Blue
Pin 6 Green
Pin 7 White-Brown
Pin 8 Brown

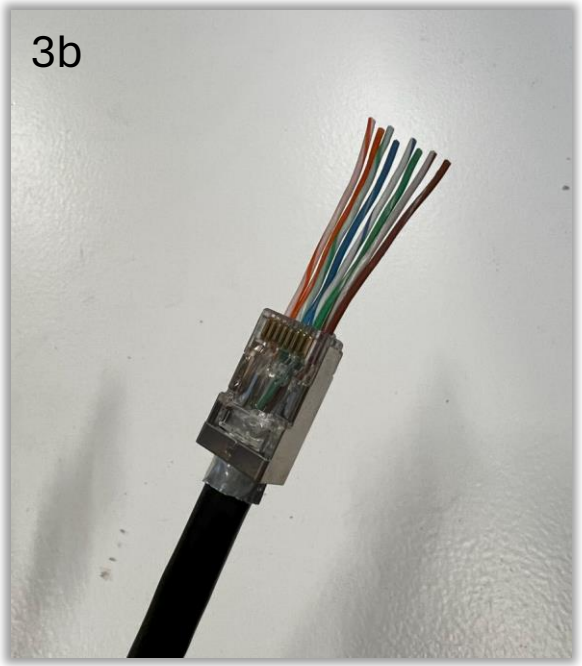
Step 3 – RJ45 Connector

Installing The RJ45 Connector

- After the conductors have been prepared according to the 568B standard, prepare the RJ45 connector.
- Once the conductors have been inserted into the RJ45 connector, verify the correct color to pin orientation before crimping.



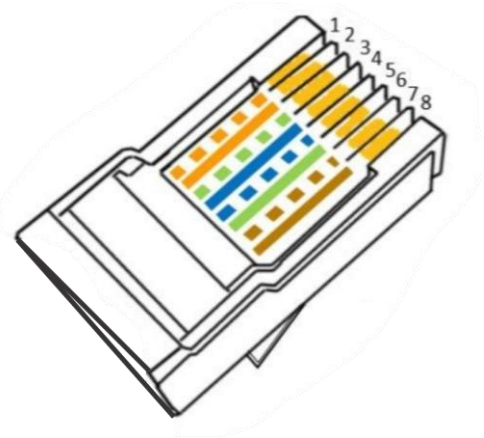
Hold the RJ45 connector so that the plastic spring clip is facing down.



Next, carefully insert the conductors into the RJ45 connector, maintaining the 568B color convention.

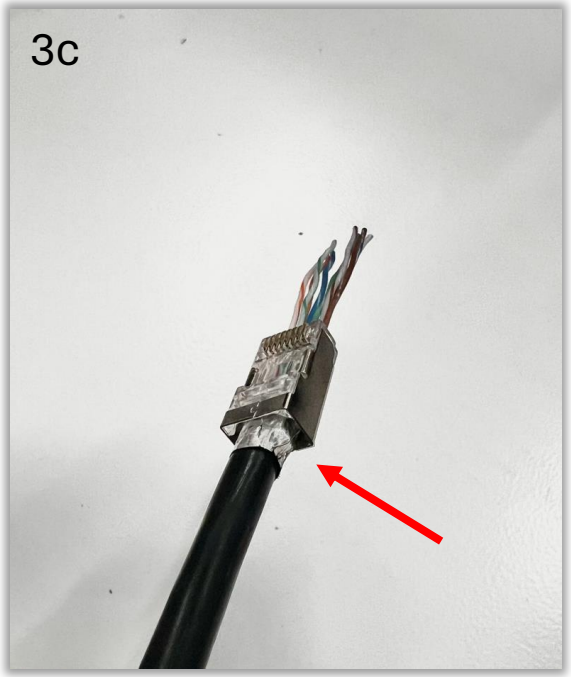
Pin 1 White-Orange
Pin 2 Orange
Pin 3 White-Green
Pin 4 Blue
Pin 5 White-Blue
Pin 6 Green
Pin 7 White-Brown
Pin 8 Brown

RJ45 Pin Location



Step 3 Continued – RJ45 Connector

Crimping The RJ45 Connector



Verify the communications cable is fully seated, and that the foil shield is in contact with the connector. No conductors shall be exposed between the connector opening and the cable jacket.

Next, insert the RJ45 connector into the crimping tool.

Crimp the connector until all excess conductors are trimmed, and the tool handle is fully closed.

Remove the RJ45 connector from the tool for visual inspection and testing.

Step 4 - Verification

Before testing the RJ45 connections, verify the following:

- ❑ Communications cable termination was made according to the 568B standard.
- ❑ The communications cable is fully inserted into the RJ45 connector without exposed conductors between the cable jacket and connector.
- ❑ The communications cable foil shield is in contact with the connector body.
- ❑ The RJ45 connector is correctly crimped, and conductors are trimmed flush.
- ❑ The communications cable has been completely removed from all FHP equipment.
- ❑ If applicable, miswired connectors have been removed and re-terminated.

Step 5 – RJ45 Connector Testing

Testing The Connection

- To ensure proper installation of the communications cable, all connections shall be tested before being placed in service. This testing includes aGate to aPower, aPower to aPower for multiple batteries, and aGate to network router.

- In this example, a two-piece Klein VDV256-100 cable tester is being used.

IMPORTANT: Damage to FHP equipment can occur if communications cable ends are not removed from all FHP equipment before testing, cutting, or terminating. A two-piece cable tester shall be used to establish continuity between cable ends.

If the Pass light illuminates, the cable can be placed into service, providing essential communications between the aGate and aPowers.

If a Fault light illuminates, inspect the connections for the correct 568B color convention and proper termination. If the fault cannot be cleared, cut off both RJ45 connectors and re-terminate following the instructions in this SOP.