DIY aF4 Feeder Trigger Using Any Smart Plug

Trigger a feed cycle from any smart plug that supports a daily schedule

Works with Red Sea ReefControl Power, or any smart plug that supports a daily schedule — v1.0

Overview

This guide shows how to automate feeding cycles on an inD Aquatics aF4 feeder using any smart plug or smart power strip — no aquarium controller required. A small 5V USB power adapter, switched on a daily schedule by your smart plug, powers an MT3608 boost converter module, which steps that 5V up to a voltage the aF4 recognizes as a trigger. All that's needed on the smart plug side is the ability to run a plain daily on/off schedule — Red Sea's ReefControl Power, TP-Link Kasa, Shelly, and most others all work the same way here, since all that's needed is reliably switching AC power on and off at set times.

Before you start

This guide is provided as a reference based on testing and inD Aquatics' own published specifications — it isn't an official or guaranteed procedure. Component quality, wiring, and individual feeder units can vary, so verify each step against your own hardware (especially the voltage checks) as you go, and proceed at your own risk.

The aF4's Trigger Rules

These come from inD Aquatics' own reference card for the feeder's 0-10V input:

- The aF4 must receive a 9V+ signal for longer than 6 seconds to trigger a feed cycle.
- The aF4 must then see a 0V signal for longer than 30 seconds before another feed cycle can trigger.
- There must be a minimum 5-minute gap between feed cycles.

In practice, any normal daily schedule leaves the outlet off for minutes or hours between feeds, so the 30-second reset window is easy to satisfy without any special care.

Plain-English Glossary

- Boost converter module: a small circuit board that takes in a lower DC voltage and outputs a higher one you can dial in. It has a tiny adjustment screw (usually on a small blue or black component) that you turn with a small screwdriver while checking the output with a multimeter.
- USB power adapter: an ordinary phone charger — it outputs 5V DC, which is what we'll feed into the boost converter.
- Drain wire: on a shielded cable, the bare copper wire that runs alongside the foil shield and is electrically the same as it — you connect to the bare copper, and the foil comes along with it.
- Polarity: DC electricity has a + (positive) and a – (negative) side, and they need to go to the matching + and – connections. This guide includes a step to check which is which with a multimeter before connecting anything.
- Tip and sleeve: the two connections used on a 3.5mm plug (the same style of plug as a headphone jack). Even on a plug with three metal bands (a stereo/TRS plug), we only use the tip and the sleeve — the middle band goes unused.

Parts List

- A smart plug or smart power strip that supports a daily on/off time schedule — Red Sea ReefControl Power, TP-Link Kasa, Shelly, or similar.
- MT3608 DC-DC step-up boost converter module.
- 1 × USB power adapter (a basic 5V phone charger) and a spare USB cable you don't mind cutting.
- 1 × 3.5mm cable — ideally one already confirmed to fit this feeder from a previous setup, or one you've test-fit first (see Step 1 below).
- Soldering iron and solder (recommended for a permanent build), or alligator clip test leads if you'd rather not solder.
- Heat-shrink tubing or electrical tape, to insulate each connection.
- Wire strippers (or small, sharp scissors and care).
- A small screwdriver, for the MT3608's adjustment screw.
- Multimeter.
- Small project box (optional, but keeps things tidy and protected).

1. Test-Fit Your 3.5mm Cable First

This step will save you a headache. Even among 3.5mm plugs that are nominally the same size and type, dimensions vary slightly between manufacturers — tip length, barrel diameter, and how deep the plug seats can all differ enough that a plug makes rock-solid contact on a multimeter but fails to connect once seated in the aF4's jack.

1. Before cutting or modifying anything, plug the bare 3.5mm cable you intend to use straight into the aF4's jack and confirm the indicator light behaves normally (steady, indicating it recognizes a cable is connected).
2. If you have a cable already confirmed to work with this feeder from a previous setup, that's the safest option to reuse or match, since it's already confirmed to fit this exact jack.
3. If a cable doesn't seat well — the light doesn't come on, or it's inconsistent when you wiggle it — try a different cable before investing time wiring it into your circuit.

2. Prepare the USB Cable

1. Cut your spare USB cable a few inches from one end — either end works. Strip about 1/2 inch (1.5cm) of the outer jacket to expose the wires inside.
2. Inside, USB cables almost always use red for +5V and black for ground, plus a green and a white wire for data that you won't need — leave those two untouched and taped off.
3. Strip a small bit of insulation off the very tips of the red and black wires so bare metal is exposed.

3. Prepare the 3.5mm Cable

1. Cut one end off your 3.5mm cable (the end that would plug into a controller, not the end that plugs into the aF4). Strip about 1/2 inch (1.5cm) of the outer jacket to see the wires inside.
2. Identify the tip (signal) wire and the sleeve/ground wire — on a shielded cable this is often a bare copper drain wire wrapped in foil. If there's a third wire (common on stereo cables), it's unused — tape it off by itself.

3. Before wiring it into your circuit, confirm which wire is which with a multimeter's continuity setting: touch one probe to a stripped wire and the other to the plug's tip, and again to the plug's sleeve (the metal barrel behind the tip). A near-0Ω reading confirms the match.
4. Strip a small bit of insulation off the very ends of the confirmed tip and sleeve wires so bare metal is exposed.

4. Connect the MT3608

The MT3608 board is labeled near its four pads: VIN+ and VIN− on the input side, VOUT+ and VOUT− on the output side. Solder is recommended for a permanent build; alligator clips work fine for initial testing.

1. If soldering: slide a small piece of heat-shrink tubing onto each of the 4 wires before you start (it can't be added after). Tin the tip of your iron and both surfaces of each joint, then touch them together and heat until they flow into one joint. Once cooled, slide the heat-shrink down over the joint and shrink it with gentle heat.
2. If using alligator clips instead: clip each connection the same way, and give each clip a gentle tug afterward to confirm it's gripping.
3. Connect: USB red wire → MT3608 VIN+.
4. Connect: USB black wire → MT3608 VIN−.
5. Connect: 3.5mm tip wire → MT3608 VOUT+.
6. Connect: 3.5mm sleeve/drain wire → MT3608 VOUT−.

5. Set the Voltage

Aim for about 9.5–10V — comfortably above the 9V trigger threshold, at or just under the feeder's 10V maximum.

1. Plug the USB adapter into a normal wall outlet for now (not the smart plug yet), so the MT3608 powers up.
2. Set your multimeter to DC volts and touch the probes to the VOUT+ and VOUT− pads — red on VOUT+, black on VOUT−.
3. Find the small adjustment screw on the MT3608 board (a tiny blue component with a brass screw on top). Turn it slowly with your screwdriver while watching the multimeter, until it reads about 9.5–10V. Small turns make a difference — go slowly.
4. Unplug the USB adapter from the wall once you're done.

6. Connect to Your Smart Plug and Test

1. Plug the USB adapter into your smart plug or power strip instead of the wall. Leave its schedule off for now.
2. Turn that outlet on manually from its app. Re-check the VOUT+/VOUT− voltage with your multimeter — it should still read about 9.5–10V.
3. Turn it off and confirm the voltage drops to about 0V within a second or two.
4. Plug the finished 3.5mm cable into the aF4's 0-10V input jack. The indicator light should turn steady, confirming it recognizes the connection.
5. Turn the outlet on manually for about a minute and watch the light: it should blink to show it received a valid trigger, and the feeder should run a feed cycle. Only once that works reliably, move on to scheduling.

7. Set the Schedule

1. Open your smart plug's app and select the outlet your feeder circuit is plugged into.
2. Set that outlet to run on a daily schedule (not a sensor- or condition-based rule).
3. Add a time slot for your feed time. Since the aF4 only needs 9V+ for 6+ seconds, a window of about 1 minute comfortably covers that without needing to cut it close — most apps schedule in whole minutes anyway.
4. For multiple feedings per day, add additional time slots, keeping them at least 5 minutes apart per inD's published rule, and leaving a reasonable gap between windows so the 30-second reset requirement is comfortably satisfied.

8. Troubleshooting

- If everything tests correctly (right voltage, right polarity, right timing) but the feeder still won't trigger, try a different 3.5mm cable before assuming there's a deeper problem. This turns out to be one of the most common snags — see the next point.
- The indicator light is your best diagnostic: it stays steady when the feeder simply recognizes a cable is connected, and blinks when it actually receives a valid trigger signal. If it stays steady through what should be a trigger, the feeder isn't receiving the signal — the electronics may be fine but something isn't reaching it.
- If your multimeter shows correct voltage and polarity measured directly on the plug's tip and sleeve, but the feeder still won't trigger once the plug is seated in its jack, suspect the physical fit of the plug rather than your wiring. This is a real, documented failure mode — two 3.5mm plugs that are nominally identical can differ just enough in dimensions that one makes full contact and the other doesn't.
- To test that theory, gently wiggle the plug while it's connected and powered, watching for a flicker or brief trigger — that indicates an intermittent or misaligned contact. If you have another cable confirmed to work with this exact feeder, swap it in as a test.
- Always check voltage right at the plug during a live test, not just from an earlier bench measurement — confirm the signal is actually present at the moment you expect it to trigger.
- Double check the smart plug's outlet is actually switched and live — plug something else into it to confirm, and confirm the USB adapter itself outputs 5V when the outlet is on.

9. Enclosure Notes

If you're housing the MT3608 in a small project box near the sump:

- Keep the box sealed against salt creep — avoid open vents; sump areas have high evaporation and fine salt aerosols that corrode exposed connections over time.
- Make sure any unused wires (like a stereo cable's middle conductor) are fully insulated and tucked away where they can't touch anything else.
- Label the box so it doesn't look like an unlabeled mystery circuit to whoever finds it next.