

SYNERGIC IS NOT AUTOMATIC

What the machine is really doing, what trim actually does, and the four things it cannot see.

What a synergic machine actually is

WIRE TYPE

WIRE SIZE

GAS TYPE

ONE STORED RELATIONSHIP
between amps and volts

Somebody measured it once, in a laboratory, on that wire, in that gas, at one stick-out. Four points on a graph. Straight lines in between. That is the whole thing.

It is not controlling your arc. It never was.

Trim is not a heat knob

Trim shifts the volts off the stored line. Volts is arc length. Reckon on about 1 mm of arc for every volt of trim.

TRIM DOWN

Shorter arc. Harsh popping, stubbing, whiskers, and lack of fusion.

TRIM UP

Longer arc. Lazy and wandering, undercut at the toes, gas coverage lifting.

It does not touch the wire feed speed. Deposition does not change and the amps barely move. Wind trim up to cure a fusion problem and you have cured nothing.

The four things the machine cannot see

1 YOUR STICK-OUT

About 7 amps per millimetre. Reach into a joint, 16 mm out to 25 mm, and 200 amps at the arc becomes 174. Nothing on the display moves. Same bead. Not the same fusion.

2 LEADS AND EARTH

It reads volts at its own terminals, so it always reads high. Four volts lost on a 31 volt arc is a 13 per cent error. Clamp on the work, not the table. Warm connections mean resistance.

3 THE GAS IN THE BOTTLE

80 argon 20 CO2 and 82/18 are one program. A nominal 20 per cent CO2 can arrive anywhere from 18 to 22 and still be compliant. No idea which bottle it is on.

4 THE WIRE LOADED

Two spools of ER70S-6 are not the same wire. And cored is not solid, it burns off faster at the same current. Cored on a solid wire program gives you undercut.

Trim on the stops is telling you something

Always need a lot more or a lot less than the machine offers? One of three things is wrong, and all three are a five minute check.

1. The stick-out is too long.
2. The program does not match the wire, the diameter or the gas actually loaded.
3. Volts are being lost in the leads, the connections or the work return.

Past plus or minus 3 volts, go and look.

Every machine calls it something else

Lincoln	Trim, 0.50 to 1.50, no volts published
Fronius	Arc length correction, per cent
Kemppi	Fine tuning, volts
EWM, Migatronic	Arc length correction, volts
Cigweld Transmig	Heat Control, volts
Cigweld BlueVenom	Volts Trim, volts
Miller	Arc Length, 0 to 99

The numbers do not transfer. Plus 2 volts on one machine means nothing on the next. And the same knob does a different job in different modes: a voltage offset on synergic CV, an arc length target on synergic pulse, and on a Lincoln in STT it really does change heat input.

Before you strike an arc

- 1 Check the program against what is actually in the machine. Wire type, diameter and the gas in the bottle.
- 2 Set the main knob in amps if the machine lets you. Same units as the procedure sheet.
- 3 Start at trim zero. That is the line the maker measured. Then tune off it.
- 4 Hold the stick-out the wire wants. About 10 to 12 mm on 0.8 and 0.9 dip, 15 to 20 mm on 1.2 spray, out to 25 mm on 1.6 cored.
- 5 Tune by ear. Dip is a fast even crackle, like bacon. Spray is a smooth hiss. Harsh popping means the arc is too short.
- 6 Write the trim down next to the amps. If it is sitting on the stops, tell your supervisor.

The full technical resource, and a live version of every curve:

grahamfry.com.au/technical-resources/synergic-mig-welding

Graham Fry | Welder, International Welding Engineer | September 2026 | Free to print and post up.

