

Universal Soldering Controller 5.2 - Kit and General Construction Questions! (Read 26945 times)

[Chris56000](#)

[Universal Soldering Controller 5.2 - Kit and General Construction Questions!](#)

« on: October 27, 2017, 07:30:25 pm »

Hi!

Some questions about the Universal Soldering Controller o/s 5.2 project, with regard to building one at home:-

- 1) Are complete kits of the PCB and electronic parts used on it available for home assembly, and can anyone recommend a good metal bench-top case that's not too difficult to drill etc;
- 2) Are there any Mounting Bezels compatible with LCD Display Modules (character or graphic) that only need a simple rectangular cut-out to mount that will provide a nice "factory assembled" type finish?
- 3) Does it need anything unusual in the way of transformers or chokes? - I'm happy to use more than one mains transformer!
- 4) Can anyone recommend a good iron? Can I use Weller "Magnastat" irons on these and simply short-out the Magnastat switch, or would I be better getting a multicore DSX-type cable and bringing the "Magnastat" contacts back to the control PCB?

All the available info seems to be a bit scattered/fragmented and if any Member who's built a nice "Pace Style" one can point me in the direction of hints/tips/docs/suggested part types/construction blog I'd be very grateful!

In addition to that, if there's any UK member with access to routing/milling/drilling facilities who's willing to do the front & rear panel cutouts for a reasonable price that'd be a great help as I'm absolutely useless with metalwork!

I'm thinking of using a simple self-adhesive or plain-paper front & rear panel overlay covered with that matt film used for covering maps on wall display, and using Abacom's "Front Designer" to make artwork - it's not building it & getting it to work that puts me off but rather rounding up bits from a multitude of suppliers and making it look presentable and not a bodged-up mess full of innumerable gashes and scratches!

I know there's any number of ready-made ones in all sorts of price-ranges and quality, but I especially enjoy kit/equipment building and having the knowledge that it's fully documented and I know exactly what parts are in it (for future replacement purposes!) down to the last screw & washer! Also limited funds mean bits have to be purchased in easy monthly instalments!

Chris Williams

« Last Edit: October 27, 2017, 07:37:31 pm by Chris56000 »

[CCB](#)

[Re: Universal Soldering Controller 5.2 - Kit and General Construction Questions!](#)

« Reply #1 on: October 28, 2017, 05:15:30 am »

Hi Chris,

I've built the UniSolder 5.2 and am very happy with it. Thanks to SparkyBG !

<http://dangerousprototypes.com/forum/viewtopic.php?f=56&t=7218&p=61175>

I did manage to purchase a kit from a guy in Russia through Ebay but he doesn't sell them anymore . If you have trouble tracking down all the parts then project might be a bit much?

You can purchase the PCB here: <https://www.ebay.com/itm/UniSolder-5-2-DIY-PCB-Universal-soldering-station-for-Hakko-JBC-Stock-EU-Spain/152735966660?hash=item238fc5e5c4:g:umEAAOSwi7RZHfti>

Instead of purchasing an enclosure and cutting the front etc you can purchase the BK2000+ soldering station, that's what the UniSolder was designed for so it mounts easily. It comes with an iron holder and isn't too badly priced considering you don't need to pay to have a front machined etc. You basically remove the insides and

install the UniSolder PCB's.

https://www.amazon.com/Blackjack-SolderWerks-BK2000-Soldering-Station/dp/B00CXAC3PK/ref=sr_1_4?ie=UTF8&qid=1509166893&sr=8-4&keywords=blackjack+soldering

See here for a demo showing the case

Transformer is suggested to use a Toroidal 120w 24v.

I purchased a Hakko clone handle and bare T12 Contoller/tips to use to assemble the UniSolder. The iron then works fine on the UniSolder and I'm going to purchase a JBC handle and tips soon.

I wouldn't say the project is cheap to finish. But considering that in New Zealand the Hakko FX-951 costs about \$600-800 then this is cheaper. When you consider the cost of JBC stations this is much cheaper.

Cheers, Carl

« Last Edit: October 28, 2017, 09:46:48 pm by CCB »

Chris56000 **Universal Soldering Controller 5.2 - Kit and General Construction Questions!**

« Reply #2 on: October 28, 2017, 01:19:00 pm »

Hi!

Thanks for your tip Carl - unfortunately the seller at the link you posted doesn't ship to the UK, but I've found the very thing to build the UniSolder in:-

<http://www.ebay.co.uk/itm/T12-Digital-Soldering-Iron-Station-aluminum-shell-case-Power-IEC-Socket-kits/152761328551?epid=706328148&hash=item239148e3a7:g:mt8AAOSwNrBZ8w1y>

So I've ordered one plus a UniSolder PCB - all I need now is a link to the Construction Docs, BOM, etc., etc!

Chris Williams

ciccio **Re: Universal Soldering Controller 5.2 - Kit and General Construction Questions!**

« Reply #3 on: October 28, 2017, 07:32:48 pm »

Be cautious: te link you post is offers the case for another kit, the ubiquitous T12 clone kit.

<https://www.ebay.com/itm/Digital-Soldering-Iron-Station-Temperature-Controller-DIY-Kits-For-HAKKO-T12/122752642940?hash=item1c94a0af7c:m:mpLxpSTSj8LyqPMMXfd9ZsA>

There is no room inside for a suitable power transformer, the front panel is completely different, no pushbuttons, no correct diplay cut-out.

I mounted the above kit (one similar, in effect) and it is very good. The only problem is tip grounding, which in my case causes instability in the tip temperature display.

Best regards

CCB **Re: Universal Soldering Controller 5.2 - Kit and General Construction Questions!**

« Reply #4 on: October 28, 2017, 08:46:01 pm »

Hi Chris,

Looking back through my emails I actually purchased the BK2000+ via Circuit Specialists Ebay site and they do ship internationally. I used Paypal.

<https://www.ebay.com/itm/BK2000-premium-digital-soldering-station-temperature-controlled-solder-iron/221584087075?hash=item339770d823:g:3SYAAOSwcnpTqual>

Sellers name is csi4u

The BOM is on the first page of the dangerous prototypes project log in the first link in my first post. There are no step by step instructions. You purchase the components and solder them on the PCB . You really need to spend a little time reading/skimming through at the first 50-100 pages and make your own notes.

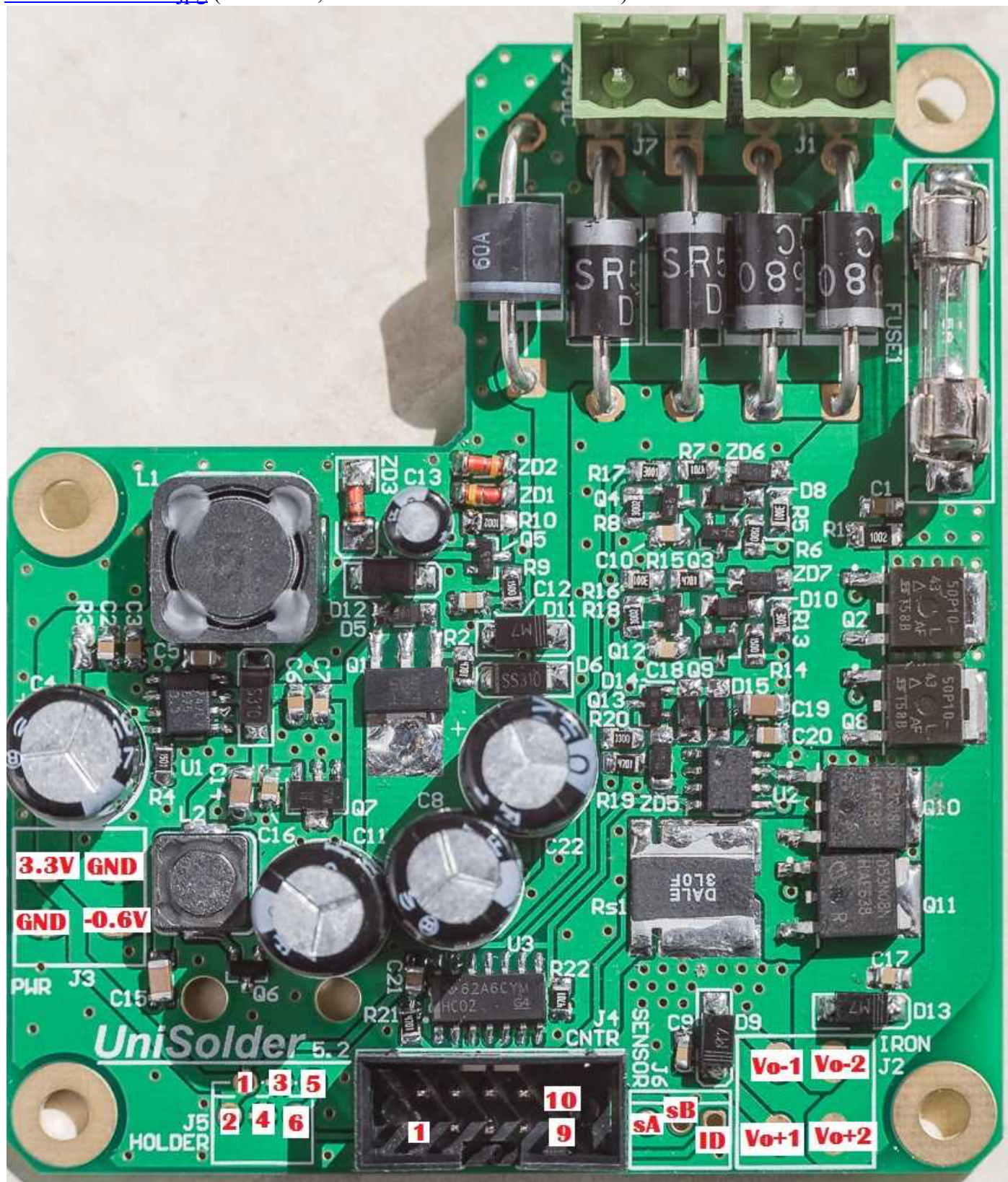
Once assembled power up the back board and check voltages before connecting it to the front board. There are forum posts on that also.

I did come across this github repository which attempts to add some documentation: <https://github.com/5N44P/unisolder-notes>

I don't want to replicate the info from DP forums. But these pics really helped me..

Cheers ,Carl

[PUZZ1026b.jpg](#) (175.42 kB, 1000x806 - viewed 4353 times.)

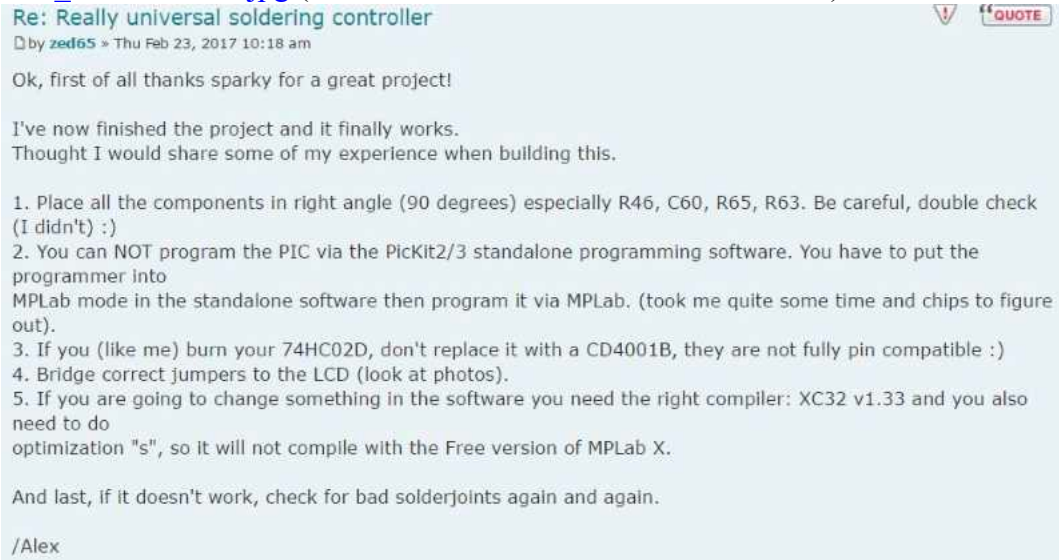


[PUZZ1024a-Pano.jpg](#) (132.96 kB, 853x1000 - viewed 3342 times.)

[PUZZ1027a.jpg](#) (82.96 kB, 800x760 - viewed 2884 times.)

[front-oled2.jpg](#) (52.46 kB, 600x493 - viewed 3299 times.)

[20160503_135557-klein.jpg](#) (50.32 kB, 800x600 - viewed 2629 times.)



Re: Really universal soldering controller
by zed65 » Thu Feb 23, 2017 10:18 am

Ok, first of all thanks sparky for a great project!

I've now finished the project and it finally works.
Thought I would share some of my experience when building this.

1. Place all the components in right angle (90 degrees) especially R46, C60, R65, R63. Be careful, double check (I didn't) :)
2. You can NOT program the PIC via the PicKit2/3 standalone programming software. You have to put the programmer into MPLab mode in the standalone software then program it via MPLab. (took me quite some time and chips to figure out).
3. If you (like me) burn your 74HC02D, don't replace it with a CD4001B, they are not fully pin compatible :)
4. Bridge correct jumpers to the LCD (look at photos).
5. If you are going to change something in the software you need the right compiler: XC32 v1.33 and you also need to do optimization "s", so it will not compile with the Free version of MPLab X.

And last, if it doesn't work, check for bad solderjoints again and again.

/Alex

[Assembly Tips.jpg](#) (35.73 kB, 800x421 - viewed 2144 times.)

« Last Edit: October 28, 2017, 09:35:55 pm by CCB »

[TheAmmoniacal](#) [Re: Universal Soldering Controller 5.2 - Kit and General Construction Questions!](#)

« Reply #5 on: May 15, 2018, 06:35:47 pm »

Time to revive this old thread.

What would you expect to get on the OLED if you power the board without an iron, holder or sensor?

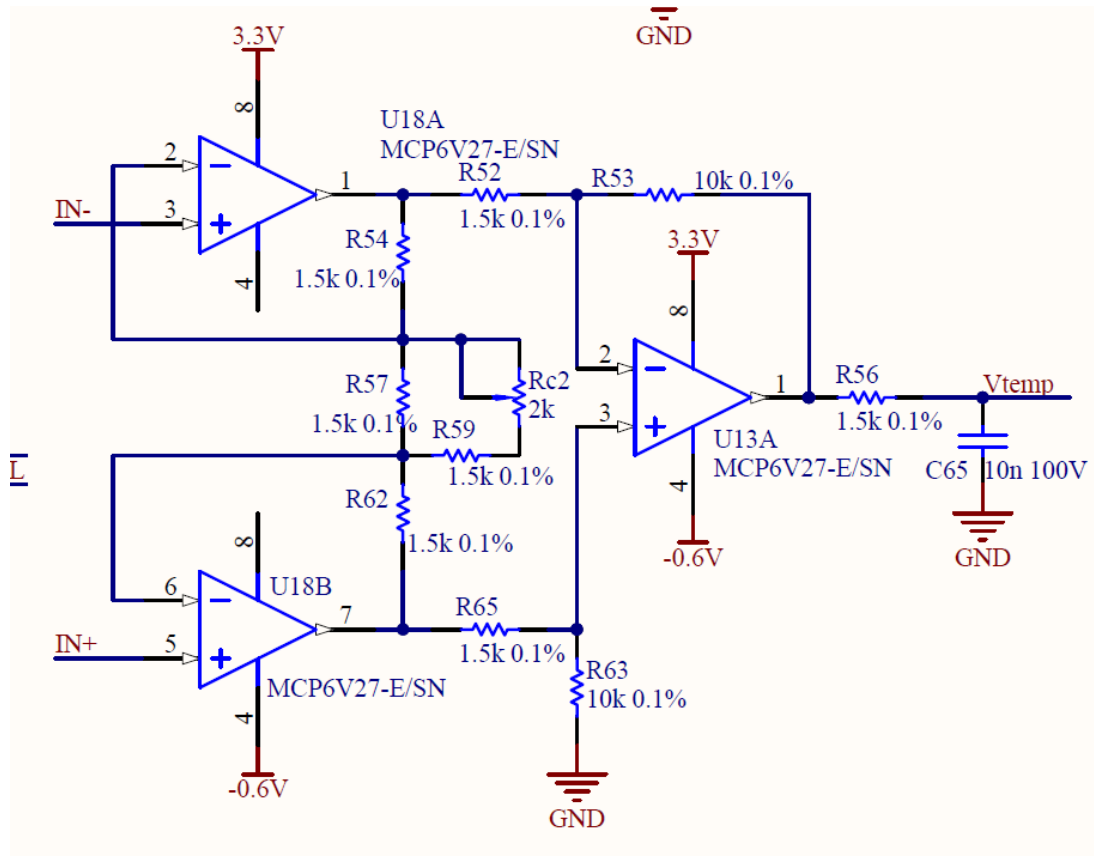
Mine displays "21" followed by "45", small text in the upper left. Buttons do nothing.

[anilverma.b](#) [Re: Universal Soldering Controller 5.2 - Kit and General Construction Questions!](#)

« Reply #6 on: September 18, 2018, 12:10:36 pm »

not sure if someone would respond on this topic but i thought would be worth trying and would really appreciate any help here as the original thread and site is not accepting any queries.

i had built this project couple of months back but did not have a decent temperature tester to measure the accuracy, i found the C245 tip was off by about -70C at a set temperature of 350C after calibrating with a decent 10Ohm 0.1% resistor. So i pushed the trimmer to both ends on the calibration menu and found the gap reduce to 20C from 70C at the anti-clockwise end. I think ill have to play around the values on R57 and R59 and probably go higher to get close to the actual temperature but my PCB is pretty beaten up and i dont think the pads will survive anymore heat cycles. If someone has any insight on what values needs to be updated in this part of the circuit so that i can jump right to it?



[Capture.PNG](#) (52.71 kB, 907x715 - viewed 1664 times.)

[anilverma.b](#) Re: Universal Soldering Controller 5.2 - Kit and General Construction Questions!

« Reply #7 on: September 18, 2018, 12:16:45 pm »

[Quote from: TheAmmoniacal on May 15, 2018, 06:35:47 pm](#)

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Mine displays "21" followed by "45", small text in the upper left. Buttons do nothing.

I used to get 21 while powering the PIC32 with the Pickit3 for programming. I suggest you check both the four pin power and 10pin ribbon for connection issues with the back board.

[TheAmmoniacal](#) Re: Universal Soldering Controller 5.2 - Kit and General Construction Questions!

« Reply #8 on: September 18, 2018, 12:55:52 pm »

[Quote from: anilverma.b on September 18, 2018, 12:16:45 pm](#)

[Quote from: TheAmmoniacal on May 15, 2018, 06:35:47 pm](#)

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I used to get 21 while powering the PIC32 with the Pickit3 for programming. I suggest you check both the four pin power and 10pin ribbon for connection issues with the back board.

That problem has long been fixed, but now I've got a new one. Using a JBC C245 the station outputs 130W continuously while the temperature displays 21-84 C. Will have to recheck the wiring...

[anilverma.b](#) Re: Universal Soldering Controller 5.2 - Kit and General Construction Questions!

« Reply #9 on: September 18, 2018, 01:45:58 pm »

That problem has long been fixed, but now I've got a new one. Using a JBC C245 the station outputs 130W continuously while the temperature displays 21-84 C. Will have to recheck the wiring...

[/quote]

That's because PIC32 is not getting any VTemp data from ADC and it keeps sending full power to the iron, is your iron getting red hot?
Disconnect C245 goto calibration menu and see what the ADC is outputting. Move the trimmer and see if the ADC value changes if not then its something wrong with ADC or the path before that. I had the same problem U15 had a loose solder joint.

[w9gb](#) [Re: Universal Soldering Controller 5.2 - Kit and General Construction Questions!](#)

« **Reply #10 on:** October 30, 2018, 03:29:05 pm »

Regarding the Magnistat ... NO.

The Universal Controller is designed for Heater and Temperature Sensor (PTC, resistive, thermocouple, etc.).

Magnistat (Magnetic Switch with Ferrous plug tips) uses "Curie Effect" with NO electronics.

Designed and Patented in 1959-1964 when electronics (Triac, ICs, modern solid-state) did not heat exist.

Damn innovative by Carl Weller's team (adjacent to world's best ferrous metallurgists at Bethlehem Steel).

Metcal/OKI uses magnetic switches with Inductive (RF) heating in its high-end solder stations.

The following users thanked this post: [cpt.armadillo](#)

[usabyken](#) [Re: Universal Soldering Controller 5.2 - Kit and General Construction Questions!](#)

« **Reply #11 on:** December 15, 2018, 03:37:48 pm »

[Quote from: TheAmmoniacal on May 15, 2018, 06:35:47 pm](#)

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Hi TheAmmoniacal

How do you fixed this?

I has the same problem display 21 then 45 in the upper left.

[TheAmmoniacal](#) [Re: Universal Soldering Controller 5.2 - Kit and General Construction Questions!](#)

« **Reply #12 on:** December 15, 2018, 03:40:56 pm »

[Quote from: usabyken on December 15, 2018, 03:37:48 pm](#)

[Quote from: TheAmmoniacal on May 15, 2018, 06:35:47 pm](#)

Time to revive this old thread.

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I did fix this problem, sadly I don't remember how. The project remains in my drawer unfinished, the problem I have now is that the iron just heats up at max power continuously.

[sixtimesseven](#) [Re: Universal Soldering Controller 5.2 - Kit and General Construction Questions!](#)

« **Reply #13 on:** April 14, 2019, 08:36:01 pm »

I have a question regarding calibration:

I got the ADC on the calibration screen to show something now but I cannot get down to R=1000, lowest would be about R=1400.

Also, there one can set "Current" from 0 to 1023(?), but as soon as I touch that value ("current") my ADC readings change and my "R" goes all over the place. At "Current: 0 0" the ADC and R stays at 0. What does that variable "Current" set?

Is there a list of the error codes somewhere? I get error 21 but have no idea what it means...

This hole Unisolder thing is really frustrating. I should have looked into it more before starting on that one. I cannot help but think that this project is far too complicated for what it is trying to archive. The BOM alone is huge and it baffles my why that should be. Documentation is pretty much non-existent (unfortunately).

[L.R Johansson](#) [Re: Universal Soldering Controller 5.2 - Kit and General Construction Questions!](#)

« **Reply #14 on:** July 02, 2019, 04:15:53 pm »

Hiya', EEVbloggers - newbie here - my pursuit of obtaining the necessary materials for developing my skills for serious electronics-work, has finally led me here. (I wanna' make motherboards for computers)

Unisolder 5.2 seems like the only way someone in my economic situation can ever (I'm about to enter long-term sick-leave) hope to obtain a quality soldering iron. Plus, it's just cool...

Anyways, I have some questions which I haven't quite been able to figure out yet, after checking youtube videos and reading here and on the Dangerousprototypes forum:

1. How many LAYERS does the pcb have? Is it merely two? 4? I can't see anyone mentioning this, anywhere. *(yes, I admit it, I haven't looked at the gerber files yet)*
2. Is it plausible that PCBWay could manufacture the pcb for me, with their free prototype program? How much does one get, when it comes to their capability? What dimensions, how many layers, how complex, et c.
3. Is it plausible that Unisolder could function reasonably well with the tips from PACE ADS200? This has been asked in the past, but no one seems to be quite sure.
4. How does the compatibility actually work here? There's a list of multiple tips and manufacturers which are confirmed to be working - but is that just "PLUG AND PLAY", or does that mean that someone has created complex firmware-profiles for these brands, to make Unisolder work with those tips?

[Shock](#) [Re: Universal Soldering Controller 5.2 - Kit and General Construction Questions!](#)

« **Reply #15 on:** July 03, 2019, 12:09:36 am »

[Quote from: L.R Johansson on July 02, 2019, 04:15:53 pm](#)

3. Is it plausible that Unisolder could function reasonably well with the tips from PACE ADS200? This has been asked in the past, but no one seems to be quite sure.

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[Sparkybg](#) the owner of the project hasn't been on the eeVBlog forums in a few years. Send him a message with the link to this thread hopefully he will get the email notification. Otherwise you could also ask him on the dangerous prototypes forum.

I believe you add a resistor to the handpiece. Software matches the detected resistance to the profile.

The Unisolder seemed to support the Pace TD-100 handpiece. It may work with the TD-200, from what I can tell the new tips are a series wired k type thermocouple and that is supported on other Unisolder handpieces. So at a minimum a new profile, but there may be other requirements for the power delivery. If you intend to run the new 120W aluminum tweezers for the ADS200 some time in the future that is a consideration as well.

I don't want to put you off your project, but assembling a Unisolder is a lot of work, once you do all the parts ordering, assembly, troubleshooting it's far easier just ordering a complete ADS200. I was looking at making a Unisolder myself, but it's an overkill if the station is already reasonably priced and efficient.

Edit:

Now you can buy complete pcbs so much less effort and expense.

« *Last Edit: April 25, 2021, 11:56:54 pm by Shock* »

[TheAmmoniacal](#) [Re: Universal Soldering Controller 5.2 - Kit and General Construction Questions!](#)

« **Reply #16 on:** July 03, 2019, 10:19:44 am »

I would also advice against the UniSolder project, I'm a year into it, almost \$200 in parts and it's still not working properly.

L.R Johansson Re: Universal Soldering Controller 5.2 - Kit and General Construction Questions!

« **Reply #17 on:** July 03, 2019, 11:49:20 am »

Quote from: Shock on July 03, 2019, 12:09:36 am

Quote from: L.R Johansson on July 02, 2019, 04:15:53 pm

3. Is it plausible that Unisolder could function reasonably well with the tips from PACE ADS200? This has been asked in the past, but no one seems to be quite sure.

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Hmm, I suppose it is... Money is immensely tight right now though, so I have to find some other solution. Cheers for the info though.

Quote from: TheAmmoniacal on July 03, 2019, 10:19:44 am

I would also advice against the UniSolder project, I'm a year into it, almost \$200 in parts and it's still not working properly.

DAMN! : O Yeah... 200\$ worth of parts, et c, to make the project, is certainly a bit too much.

All right, you guys have given me some more realistic perspectives on things, so I'll be leaving Unisolder for the time being - I'll revisit it in the future, once I've gotten some more skills and, above all, funding.

TheAmmoniacal Re: Universal Soldering Controller 5.2 - Kit and General Construction Questions!

« **Reply #18 on:** July 04, 2019, 08:26:52 am »

Even with a fully assembled and tested UniSolder, it will give you a lot of headache correctly wiring the iron, changing the socket/plug, adding sense resistor, calibration etc. The documentation is just not good, you pretty much have to go through 200 pages of forum posts to find information piece by piece.

sixtimesseven Re: Universal Soldering Controller 5.2 - Kit and General Construction Questions!

« **Reply #19 on:** July 04, 2019, 11:48:57 am »

I assembled my unisolder now and it works. Only problems are that at power up, it does not detect an iron. After 20-30s it does and it heats up... Second problem is that I had to replace Q1 which forms the overvoltage circuit.

I think the unisolder was a good idea, but just looking at the schematic gives you the impresion that there is FAR to much stuff on there.

Marco Reps did a short youtube video regarding the JBC245 irons. All he used was a triac, a small micro and

some jellybean parts. That should give you an idea...

EDIT: Ok, it was a bit more involved. But not much... I like his DIY Station, very very simple... Link to the video:

« *Last Edit: July 04, 2019, 11:51:33 am by sixtimesseven* »

sixtimesseven **Re: Universal Soldering Controller 5.2 - Kit and General Construction Questions!**

« **Reply #20 on:** July 04, 2019, 12:00:07 pm »

Quote from: TheAmmoniacal on December 15, 2018, 03:40:56 pm

Quote from: usabyken on December 15, 2018, 03:37:48 pm

Quote from: TheAmmoniacal on May 15, 2018, 06:35:47 pm

Time to revive this old thread.

What would you expect to get on the OLED if you power the board without an iron, holder or sensor?

Mine displays "21" followed by "45", small text in the upper left. Buttons do nothing.

Hi TheAmmoniacal

How do you fixed this?

I has the same problem display 21 then 45 in the upper left.

I did fix this problem, sadly I don't remember how. The project remains in my drawer unfinished, the problem I have now is that the iron just heats up at max power continuously.

I noticed this behaviour when I would Power up the iron and disscnect the sense wires after it starts to heat up. Which is a bit worrisome since a failure of those wires could pose a fire risk.

However, I cannot start the iron without the sense wires attached. Are you sure the heating is comanded by the micro? Is there a Power indicator on the Oled? If not I would suspect the drive circuit.

TheAmmoniacal **Re: Universal Soldering Controller 5.2 - Kit and General Construction Questions!**

« **Reply #21 on:** July 04, 2019, 01:10:01 pm »

The status of my UniSolder project remains the same, when I power on the station it just feeds full power to it continously. It would glow red hot if I didn't put it in a glass of water. The OLED correctly display the power being delivered (125-127W) for a JBC C245 tip, however the temperature reading is stuck at ~RT (24-27 C). The current source is working.

It's difficult to troubleshoot without the iron connected, but neither do I want to destroy my tips..

martin1454 **Re: Universal Soldering Controller 5.2 - Kit and General Construction Questions!**

« **Reply #22 on:** July 04, 2019, 01:29:12 pm »

Just a heads-up if you plan to just use the JBC T245, this is cheaper, but only works for the T245:

<https://www.tindie.com/products/soguklehim/soldering-iron-controller-v32-for-jbc-t245c245/>

sixtimesseven **Re: Universal Soldering Controller 5.2 - Kit and General Construction Questions!**

« **Reply #23 on:** July 04, 2019, 02:47:14 pm »

Quote from: TheAmmoniacal on July 04, 2019, 01:10:01 pm

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It's difficult to troubleshoot without the iron connected, but neither do I want to destroy my tips..

Sounds about the same as when I disconnect the sense wire. The temperature would be stuck around 25-30degC (on the display). I would double check all the soldering points, values and connections to the iron in the temp. sense section.

Try Power the Unisolder via a lab supply. When I did so and limited to 20V 1A, the iron would only pull about 15W. Maybe by limiting it even lower you could manage the heat.
In addition, try putting the iron into a cup of water before you power it on. That way it could not go far above 100degC.

Shock **Re: Universal Soldering Controller 5.2 - Kit and General Construction Questions!**

« **Reply #24 on:** July 04, 2019, 05:01:36 pm »

Quote from: martin1454 on July 04, 2019, 01:29:12 pm

Just a heads-up if you plan to just use the JBC T245, this is cheaper, but only works for the T245

A heads up as well, the tindie JBC controller has no power supply. You can setup a Pace ADS200 for the same price but get everything included and it runs both standard and high mass tips in the same handpiece.

Tips are only \$11-\$13 each instead of ~\$30-\$50 and the tip working distance is superior to both the T245, T470 handpieces due to Pace going with an aluminum design (better heat spreading).

Quote from: sixtimesseven on July 04, 2019, 11:48:57 am

Marco Reps did a short youtube video regarding the JBC245 irons. All he used was a triac, a small micro and some jellybean parts

After that video Marco made two more stations, but ended up getting an ADS200 which he is still using as of his latest video. He did a quick comparison and showed the same heating speed on the Pace ADS200 vs a JBC handpiece running on a Unisolder station. The JBC CDB stations do appear slightly faster, but my guess is the heating profile sacrifices regulation (overshoot) for speed, it's a double edged sword.

vulkan35 **Re: Universal Soldering Controller 5.2 - Kit and General Construction Questions!**

« **Reply #25 on:** July 16, 2019, 10:23:50 am »

Unisolder + JBC

<https://youtu.be/-9ToURbpEdM>

Shock **Re: Universal Soldering Controller 5.2 - Kit and General Construction Questions!**

« **Reply #26 on:** July 16, 2019, 11:42:56 am »

Quote from: vulkan35 on July 16, 2019, 10:23:50 am

Unisolder + JBC

About 3 seconds it looks, just tested the Pace ADS200 and got the same at 300C on the 1/128" Conical Special (0.20mm) standard tip. People will see that video and think it's amazing until they use it to solder a large ground plane heheh.

I like though that the Unisolder tracks more accurately than the JBC station, it makes it look super responsive. The firmware needs a little tweak to add an option to switch off the temp bobbing around set temp, that would get annoying after a while.

vulkan35 **Re: Universal Soldering Controller 5.2 - Kit and General Construction Questions!**

« **Reply #27 on:** July 17, 2019, 02:52:17 am »

Quote from: Shock on July 16, 2019, 11:42:56 am

People will see that video and think it's amazing until they use it to solder a large ground plane heheh.

Unisolder + JBC C210-020 Conical (0.1mm).

<https://youtu.be/P6qSktUEUMs>

Unisolder + 2245-SK3.0 (cutter 3mm, clone china).

<https://youtu.be/4VizCWBZDJA>

Shock **Re: Universal Soldering Controller 5.2 - Kit and General Construction Questions!**

« **Reply #28 on:** July 17, 2019, 05:00:53 am »

Quote from: vulkan35 on July 17, 2019, 02:52:17 am

Unisolder + JBC C210-020 Conical (0.1mm).

<https://youtu.be/P6qSktUEUMs>

At 5 seconds you can see it display 2 degrees, that doesn't seem right.

vulkan35 **Re: Universal Soldering Controller 5.2 - Kit and General Construction Questions!**

« Reply #29 on: July 17, 2019, 07:13:03 am »

Quote from: Shock on July 17, 2019, 05:00:53 am

display 2 degrees, that doesn't seem right.

what 2 degrees are you talking about

Shock **Re: Universal Soldering Controller 5.2 - Kit and General Construction Questions!**

« Reply #30 on: July 17, 2019, 09:14:52 am »

Quote from: vulkan35 on July 17, 2019, 07:13:03 am

Quote from: Shock on July 17, 2019, 05:00:53 am

display 2 degrees, that doesn't seem right.

what 2 degrees are you talking about

Slow the video down the first displayed measurement appears to be 2 degrees C. On the other iron it measured 10 degrees C. Unless this is not a measurement and something else, but it looks like a bug.

vulkan35 **Re: Universal Soldering Controller 5.2 - Kit and General Construction Questions!**

« Reply #31 on: July 17, 2019, 11:01:25 am »

Quote from: Shock on July 17, 2019, 09:14:52 am

Slow the video down the first displayed measurement appears to be 2 degrees C. On the other iron it measured 10 degrees C. Unless this is not a measurement and something else.

what measurement are you talking about, on the video at what point in time is happening?
since 0.31 or later, specify the exact time.

SiliconWizard **Re: Universal Soldering Controller 5.2 - Kit and General Construction Questions!**

« Reply #32 on: July 17, 2019, 01:05:06 pm »

Yes, 2°C is the very first displayed temp measurement value that we can see at about 5s.

I don't know whether it's just a display problem, an initialization problem or whether the measured tip temperature is really off at room temperatures.

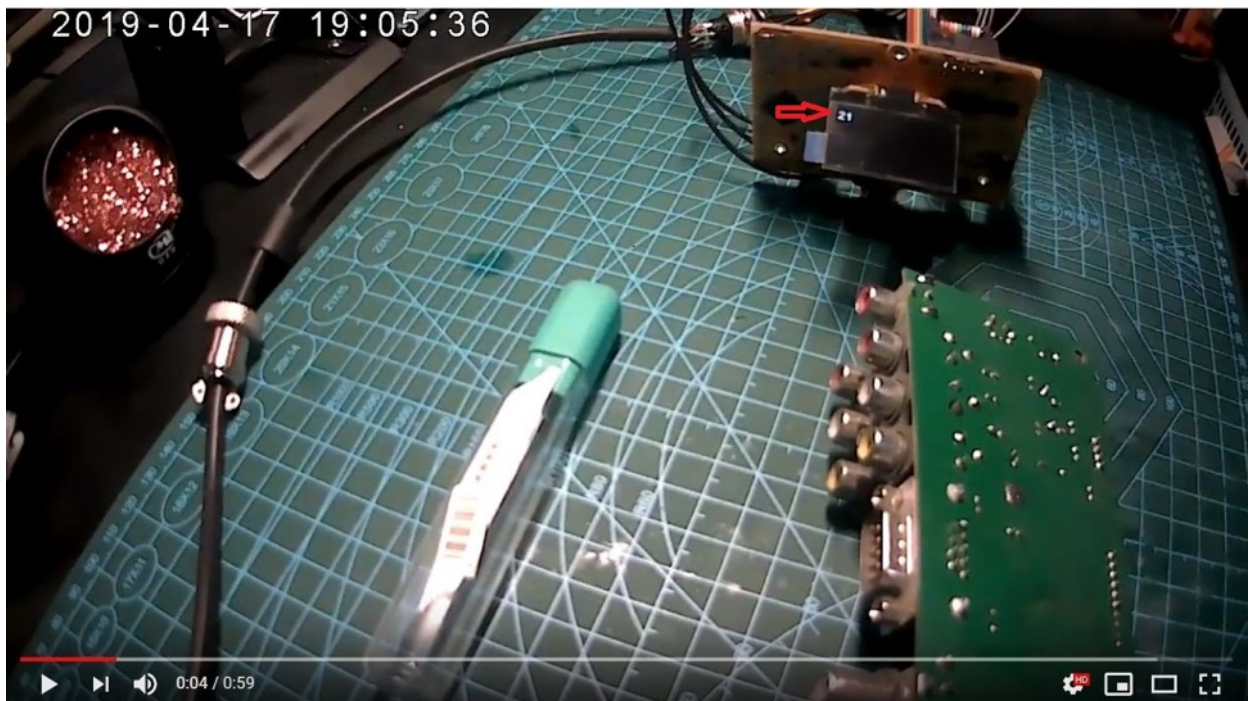
vulkan35 **Re: Universal Soldering Controller 5.2 - Kit and General Construction Questions!**

« Reply #33 on: July 17, 2019, 02:07:20 pm »

Quote from: SiliconWizard on July 17, 2019, 01:05:06 pm

Yes, 2°C is the very first displayed temp measurement.

Input power initialization code 21 AC or DC, not temperature.



[uni.jpg](#) (230.35 kB, 1225x690 - viewed 305 times.)

SiliconWizard **Re: Universal Soldering Controller 5.2 - Kit and General Construction Questions!**

« Reply #34 on: July 17, 2019, 02:16:55 pm »

Not what we were talking about...



[c210_020.png](#) (1147.36 kB, 1264x723 - viewed 236 times.)

vulkan35 **Re: Universal Soldering Controller 5.2 - Kit and General Construction Questions!**

« Reply #35 on: July 17, 2019, 03:30:52 pm »

Quote from: SiliconWizard on July 17, 2019, 02:16:55 pm

Not what we were talking about

seems to understand what you mean, 4-5s set degrees begins.
scale set from 0 to 350 degrees.

SiliconWizard **Re: Universal Soldering Controller 5.2 - Kit and General Construction Questions!**

« Reply #36 on: July 17, 2019, 03:37:47 pm »

I suspect a few possibilities:

- that the controller doesn't do any kind of cold-temperature compensation (haven't looked closely at this project, so this may actually be obvious), in which case the measured tip's temperature can't really reflect room temperature when it's at room temperature...
- that they have implemented some kind of low-pass filtering of the temperature readings, with the low-pass filter initialized to zero °C, so this would just be the low-pass filter settling,
- that the temperature sensing is not properly calibrated,
- that it's a bug.

It's likely one of the first 2 or 3, or even a mix of all these.

vulkan35 **Re: Universal Soldering Controller 5.2 - Kit and General Construction Questions!**

« Reply #37 on: July 17, 2019, 03:49:09 pm »

Quote from: SiliconWizard on July 17, 2019, 03:37:47 pm

- that the controller doesn't do any kind of cold-temperature compensation

from this temperature begins the set, therefore the number 2 can be seen at 5 s.



[IMG_0059.jpg](#) (493.71 kB, 1600x1200 - viewed 500 times.)

marchtmdsmiling Re: Universal Soldering Controller 5.2 - Kit and General Construction Questions!

« Reply #38 on: July 19, 2019, 12:54:31 am »

I want to represent the other side of this a little bit, as noone else has. This project is definitely complex, and can end up costing more than you bargained for if you make some costly mistakes, however it is also an extremely rewarding project upon completion. Partly because you get to count yourself amongst the people who did it successfully and partly because you now have a top notch tool that you yourself made, although did not design.

I took longer than id like to admit to finish the project, about a month. If i had correctly identified my problem in the beginning it would have been a week. My problem was that i somehow put a 1% 10k resistor in the adc instead of the specced 0.1%. I blame lcsc and all their 0's and 1's jumbling together and not my dumb ass. Anyway. If you are careful assembling the board, very very careful, you can get it right the first time and not need to do any troubleshooting.

O and you can search the 200 pages of forum posts using google site search to not have to read it all. And in my experience, you can thermal cycle the hell out of alot of components without damaging them, right away at least. Especially with 2 oz copper it seems.

sparkybg Re: Universal Soldering Controller 5.2 - Kit and General Construction Questions!

« Reply #39 on: November 07, 2020, 10:54:24 pm »

Just to inform you that the development continues.

New:

- Added 1/2 and 1/4 power for small irons - no need of lower voltage transformer on small irons - drives them all from 24V toroidal transformer.
- Added JBC C105/C115 nano iron
- Added JBC Nanotweezers (although not tested - waiting it to arrive)
- Added PACE TD200 iron
- JBC C210 and microtweezers works on 1/4 power MUCH more smoothly
- Added support for SH1106 display controller
- Added holder sensor filtering
- Added wake up by key or sensor
- Revised almost all iron profiles (due to malfunction in my controller some of them were incorrect)

Here is Git repo with really good notes and explanation for everything:

<https://github.com/valerionew/unisolder-notes>

Here is my repo (linked to the above), where I upload latest firm ware etc.

<https://github.com/sparkybg/UniSolder-5.2>

There are various places on the web where PCBs, sets of parts, and even ready assembled board can be purchased, Tindie for example.

P.S: Small movie driving JBC C105 (these are TINY):

« Last Edit: November 07, 2020, 10:59:12 pm by sparkybg »

The following users thanked this post: [Chris56000](#), [girishv](#)

Shock **Re: Universal Soldering Controller 5.2 - Kit and General Construction Questions!**

« Reply #40 on: November 08, 2020, 03:42:37 am »

Hey Sparkybg welcome back and congrats on the update! Awesome to see you into your project again. Was a bit of a coincidence as a few days ago I was going over your old videos admiring your Blackjack cases again and noticed the new video up (which I watched of course).

Couple of questions if you don't mind. Can the detection resistors be easily added into dongles/adapters so you don't need to modify the handpieces at all? What do you think the current BOM cost is (rough cost of everything but the transformer and case)? How is calibration of individual tips currently dealt with?

This last one is more a cosmetic question (so an after thought) but I was thinking about a slightly larger display and if you had considered some optional software smoothing to reduce the idle temp jitter (but better than how JBC CDB stations do it). How easy it would be to implement in the current firmware/software?

sparkybg **Re: Universal Soldering Controller 5.2 - Kit and General Construction Questions!**

« Reply #41 on: November 08, 2020, 11:19:40 am »

Idle temp jitter is already filtered more then you can imagine. I am just showing the real temperature. Many controllers dont - they show the set temperature if the real one is close enough. I tried this - it sucks IMHO.

The cost of assembled PCBs in Tindie is \$99. With slightly larger display.

There are working displays upto 2.5 inch I think. You will have to find this in the thread at dangerous prototypes.

<http://dangerousprototypes.com/forum/index.php?topic=10358.msg70400#msg70400>

Just ask the user what display it uses.

The ID resistors can be anywhere, as long as they are connected to the wires needed. It is your choice is you make dongle, cable adapter to the original connector or resistors in the very connector as I did.

Chris56000 **Re: Universal Soldering Controller 5.2 - Kit and General Construction Questions!**

« Reply #42 on: November 09, 2020, 06:33:25 pm »

Hi!

There doesn't seem to be any new B.J. type soldering stations for sale at the moment when I checked a fortnight ago, but I managed to win a good used one from Spalding in Lincolnshire (my favourite "Police Interceptors" series!!), so my UniSolder will begin when I find where I've put the PCBs!

Member SparkyBG has come back at just the right time, I can use his very latest firmware and code now!

Chris Williams

sparkybg **Re: Universal Soldering Controller 5.2 - Kit and General Construction Questions!**

« Reply #43 on: November 09, 2020, 09:01:21 pm »

There is:

<https://www.circuitspecialists.eu/soldering/hot-tweezer-stations/bk-3000-multipro-blackjack-solderwerks->

...but a guy here even sold some completely finished stations:

<http://dangerousprototypes.com/forum/index.php?topic=10358.msg70400#msg70400>

And some other guy made a dedicated case for it:

<https://www.prusaprinters.org/prints/40735-unisolder-52-case-wip>

Just to be clear - I have nothing to do with either of these. I made it for BlackJack case just because I had one. I just admire everyone that adds something from themselves in this project.

ov darkness **Re: Universal Soldering Controller 5.2 - Kit and General Construction Questions!**

« **Reply #44 on:** January 02, 2021, 01:38:37 am »

Wow, thanks @sparkybg!

I just found this project, and I was terrified by amount of problems people have. But with this update and even an printable enclosure (I was planning to design printable one myself) and Pace costing near 450EUR in Poland i think I'll give it a try.

Is there any possibility to use larger 2.42" OLED? They are mainly using SPD0301 controler.

I like large displays, as my vision is not as good as 20 years ago

sparkybg **Re: Universal Soldering Controller 5.2 - Kit and General Construction Questions!**

« **Reply #45 on:** January 02, 2021, 10:18:34 am »

There are some people that are using 2.47 display. SPD0301 seems compatible with SSD1306 the project was made for, so you should be able to use a display with SPD0301. Although there are displays with SSD1309 with is also compatible.

The problems come when someone was not prepared for soldering a project with this kind of complexity, or did not read at least the first page of the thread carefully.

There are maybe thousands made already (500 at least), so definitely there are no problems with hardware for a long time, and there are no major problems with firmware that weren't fixed shortly after they are reported.

Here is it with larger display:

« *Last Edit: January 02, 2021, 10:30:56 am by sparkybg* »

ov darkness **Re: Universal Soldering Controller 5.2 - Kit and General Construction Questions!**

« **Reply #46 on:** January 03, 2021, 05:22:55 pm »

Reading The Friendly Manual is always good practice

As is triple checking solder joints.

Jane **Re: Universal Soldering Controller 5.2 - Kit and General Construction Questions!**

« **Reply #47 on:** January 14, 2021, 05:40:27 pm »

Is it possible to use that controller with JBC nano-tweezer AN115-a ?

sparkybg **Re: Universal Soldering Controller 5.2 - Kit and General Construction Questions!**

« **Reply #48 on:** January 15, 2021, 12:03:32 pm »

Yes, it is. It drives C105/C115 tips, and it can definitely drive AN115.

Although there is no profile for nanotweezers in the firmware for the moment, it will be available soon - I am waiting for my nanotweezers to arrive.

The following users thanked this post: [Jane](#)

Jane **Re: Universal Soldering Controller 5.2 - Kit and General Construction Questions!**

« **Reply #49 on:** January 15, 2021, 12:36:22 pm »

Great. Do you know the timeline when you will be able to confirm it will work with AN115(when profile for nanotweezers in the firmware will be available)?

Do you think it will not be a problem (regarding lifetime) in comparison with the original JBC station?

(In the past I built a station from one soldering kit - built for Weller - but the problem was that the original Weller tip was burnt in a short time.

Are there any users that already uses C105/C115 tips?

sparkybg **Re: Universal Soldering Controller 5.2 - Kit and General Construction Questions!**

« **Reply #50 on:** January 15, 2021, 02:30:50 pm »

I confirm that it will work! 1000000%

And there aren't any lifetime issues. From about 2 months I implemented 1/2, 1/4. 1/8 power regulations and it drives even tiny tips really well.

... and I am using my controller for more than 5 years now. No burnt tips whatsoever.

In nanotweezers the tips are the same C105/C115 it already handles pretty well. The only difference is that there's two of them in one instrument, just like the two C210-like tips in Microtweezers I have for a looong time already. No problems with them also.

« *Last Edit: January 15, 2021, 02:33:46 pm by sparkybg* »

Jane **Re: Universal Soldering Controller 5.2 - Kit and General Construction Questions!**

« **Reply #51 on:** January 15, 2021, 08:54:12 pm »

And what is a current price of the Unisolder 5.2?

sparkybg **Re: Universal Soldering Controller 5.2 - Kit and General Construction Questions!**

« **Reply #52 on:** January 15, 2021, 09:02:13 pm »

\$99 for assembled boards on Tindie. I am not selling it - chinese guy does.

Doomedahab **Re: Universal Soldering Controller 5.2 - Kit and General Construction Questions!**

« **Reply #53 on:** February 03, 2021, 02:09:00 pm »

As someone who built several sets of unisolder 5.2 and 5.2c boards I can testify that it really is not hard if you can work methodically, use copious amounts of flux, and know how to handle a soldering iron.

I built my first set in 2018 with a cheap T12 station and without hardly any soldering experience. I did run into some small issues, but nothing that could not be solved with the help of the great community over at dangerousprototypes (the existence of that community is another great reason to build this station over all other clones imho).

And like someone said before: there is a great sense of satisfaction when after the build, you load the firmware, and *beep* the station springs to life

The latest firmware supports rotary encoder operation, which brings the operation of the station to the next level. There really is no other station like it.

Ground Loop **Re: Universal Soldering Controller 5.2 - Kit and General Construction Questions!**

« **Reply #54 on:** April 25, 2021, 10:51:36 pm »

I got my hands on a Unisolder kit. It's been a bit of trial by fire as my first SMD project, but after a few setbacks I have the boards built, connectors made up and PIC programmed. Now I'm getting the 21 then 45 display on power up. Anyone know what this means and how to fix it?

sparkybg **Re: Universal Soldering Controller 5.2 - Kit and General Construction Questions!**

« **Reply #55 on:** April 26, 2021, 12:06:23 am »

You have either I2C pullup resistors rotated 90 degrees on PCB (very common error), or a device on I2C bus is malfunctioning.

21 is not an error. Init step 21 is detecting if AC or DC power is using, so it is normal to show for a while at startup. Step 45 means that I2C bus is initialized, and right after it the MCU tries to read from the EEPROM, which is I2C device.

The following users thanked this post: [Shock](#)

Ground Loop **Re: Universal Soldering Controller 5.2 - Kit and General Construction Questions!**

« **Reply #56 on:** April 26, 2021, 01:12:17 am »

Thanks for the quick response Sparky! Found the I2C clock pin on the uC flapping in the wind. Now it appears to work.

Ground Loop **Re: Universal Soldering Controller 5.2 - Kit and General Construction Questions!**

« **Reply #57 on:** Yesterday at 05:55:52 pm »

Quote from: sparkybg on April 26, 2021, 12:06:23 am

You have either I2C pullup resistors rotated 90 degrees on PCB (very common error), or a device on I2C bus is malfunctioning.

21 is not an error. Init step 21 is detecting if AC or DC power is using, so it is normal to show for a while at startup. Step 45 means that I2C bus is initialized, and right after it the MCU tries to read from the EEPROM, which is I2C device.

Ok Sparky, one last hurdle. I have it built, programmed, calibrated and recognizing resistors for TD-200. Now I just need to connect the TD-200. In my TD-200 handle I have two wires (red, blue) for the heater that I assume connect to Vout1+ and Vout1-. I have two that appear to connect to a thermocouple (grn+ and wht-). I assume grn connects to SENSEA, but where does wht- connect to? Vout1-? Also, for the other channel Vout2+, Vout2-, SENSEB, do I just leave those hanging or do they need to be terminated somehow. Thanks for your help.

sparkybg **Re: Universal Soldering Controller 5.2 - Kit and General Construction Questions!**

« **Reply #58 on:** Yesterday at 06:23:04 pm »

1. Red (heater+ and TC+) to SenseA and Vout1+
2. Green (outer shell) and blue (heater-, TC- and Cold junction sensor-) to EARTH and Vout1-
3. White(Cold junction sensor +) to SenseB

This way the controller uses also the cold junction compensation sensor, located in the TD200 handle (more precise, because it is located exactly where the cold junction is), instead of controller's interna room temperature sensor (the sensor itself is very accurate, but is too far away from the real cold junction and can be influenced by the PCB temperature when a case with inappropriate ventilation is used for the controller.

And as I wrote in the main thread - the EARTH (Mains EARTH) is different from GND(power ground) and is not connected to anywhere but the controller's case (if made from conductive material) and to iron's connector, where it is connected to the iron depending on iron's model.

« *Last Edit: Yesterday at 06:29:27 pm by sparkybg* »

The following users thanked this post: [Shock](#)

Ground Loop **Re: Universal Soldering Controller 5.2 - Kit and General Construction Questions!**

« **Reply #59 on:** Today at 02:34:27 am »

That should do it. Thanks Sparky.

[blueskull](#)

[Yet Another DIY JBC](#)

« on: July 20, 2017, 09:31:06 pm »

Being inspired by a few YouTube EE bloggers, I decide to build my own JBC T470 controller.

However, I don't intend to use the same structure used by everyone else (triac controlled mains xfmr).

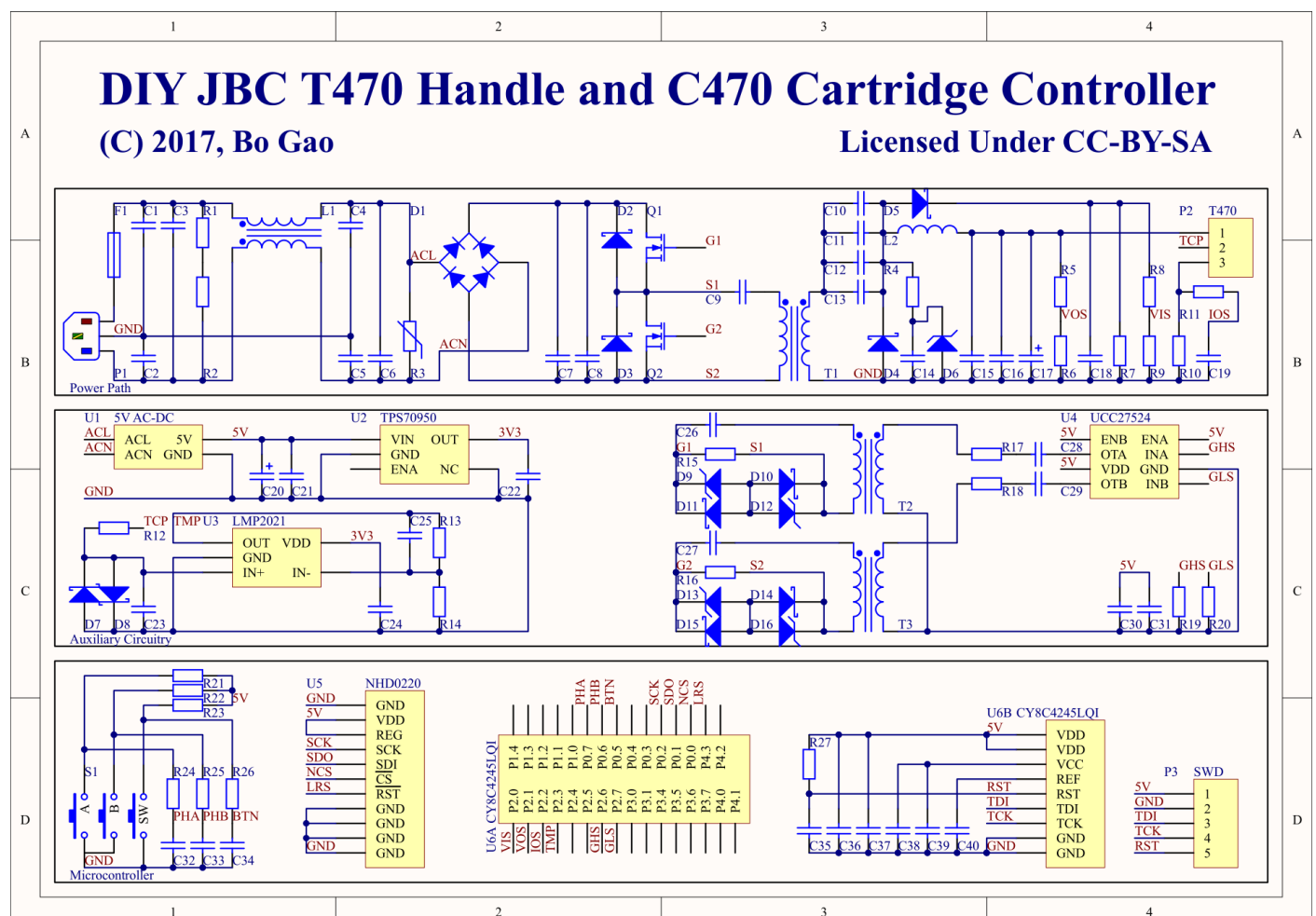
My goal is to build a small, portable T470 controller that occupies very little space, it better not be bigger than my FX888D.

So, some details of implementation must be different. Here I used a high frequency half bridge converter to regulate power.

Since the bus capacitors on both sides are very low compared with the rated 250W power, the heating element effectively sees only rippling mains frequency AC, therefore PFC is not needed while PF can still be very high.

Also due to the bus capacitance is very small, and the RC/LC constant is far below mains frequency (yet considerably higher than switching frequency, 200kHz), so I can still skip mains cycles to read thermocouple voltage accurately.

The UI is a 2002 character SPI OLED module from Newhaven and a rotary encoder with push button. Auxiliary power supply is a Traco 5V power module with very low standby power consumption.



[Schematic.pdf](#) (201.92 kB - downloaded 109 times.)



[Schematic.png](#) (289.49 kB, 1896x1334 - viewed 2148 times.)