Dremel 3D45: Connecting to the Polar Cloud

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Chapter 1

Prerequisites

In order to connect the Dremel 3D45 printer to the Polar Cloud, you must have the printer connected to the Internet (see Section 1.1), and you must have a Polar Cloud account (see Section 1.2).

1.1 Network connection of the Dremel 3D45 printer

An Internet connection is required to connect the Dremel 3D45 printer to the Polar Cloud. And you must connect your Dremel 3D45 printer to a (local, Internet-connected) network via either WiFi or Ethernet to achieve Internet connection.

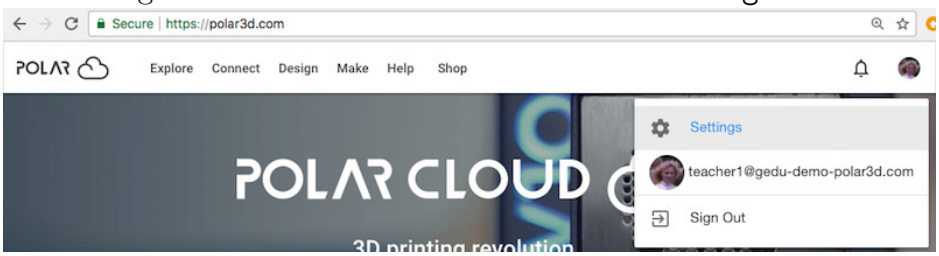
For details on connecting your printer to a local network, see your Dremel printer documentation.

Or a video walk-through of connecting your Dremel 3D45 printer to your local network may be found at the Polar 3D YouTube channel: Polar Cloud Enabling your Dremel 3D45.

1.2 Required Polar Cloud account information

To connect (register) your Dremel printer to your Polar Cloud account, you will need to supply an email address associated with a Polar Cloud account, and that account's "`PIN Code`". If you do not already have a Polar Cloud account, you can create one by going to http://polar3d.com and logging in via Google, Facebook, Microsoft Live, or Microsoft Office 365. Once logged in, click on your account profile image – near the screen's upper right corner, as seen in Figure 1.1. (In Figure 1.1, the Polar Cloud member has set a profile image – but if you are a new Polar Cloud member, you may instead have a generic icon.) Then click on the "`Settings`" tab; see Figure 1.1.

Figure 1.1: Polar Cloud account menu `Settings` tab



At the resulting "`SETTINGS`" screen, see Figure 1.2, make a note of the "`Email`" address and "`PIN Code`" for the account, located towards the lower left; see Figure 1.3.

Figure 1.2: Polar Cloud account `SETTINGS` screen

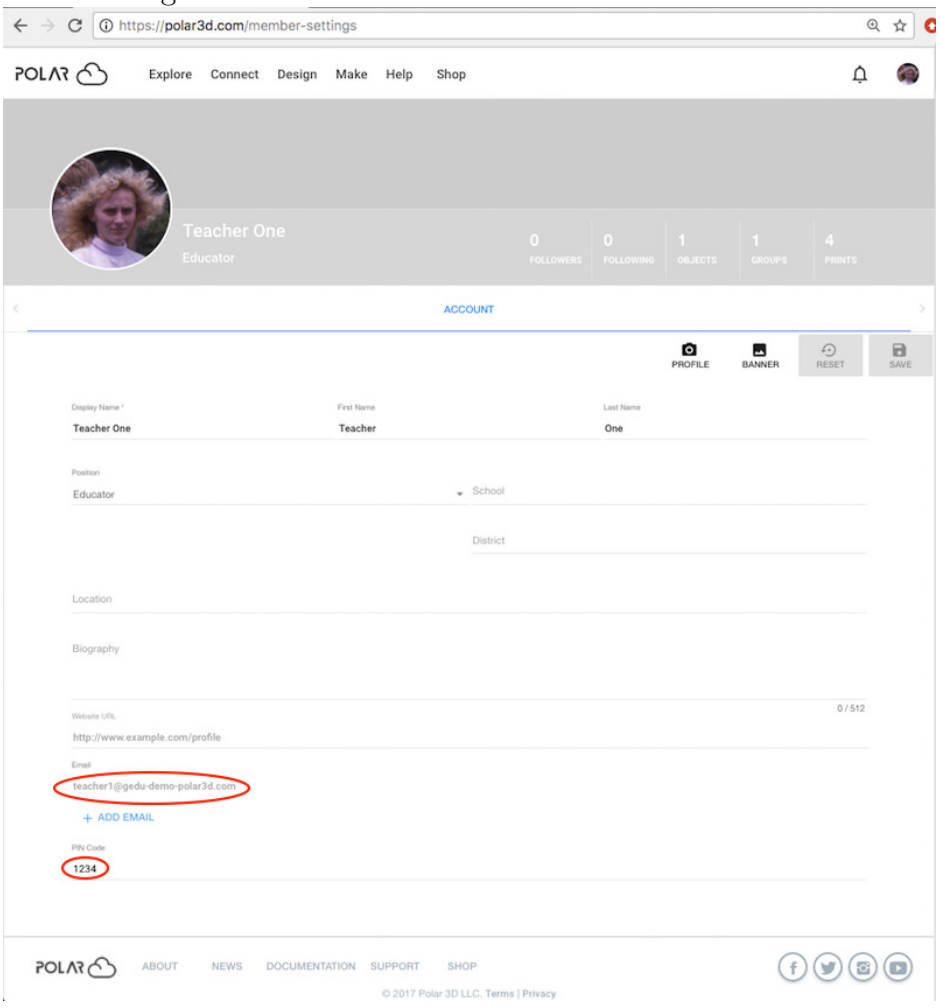
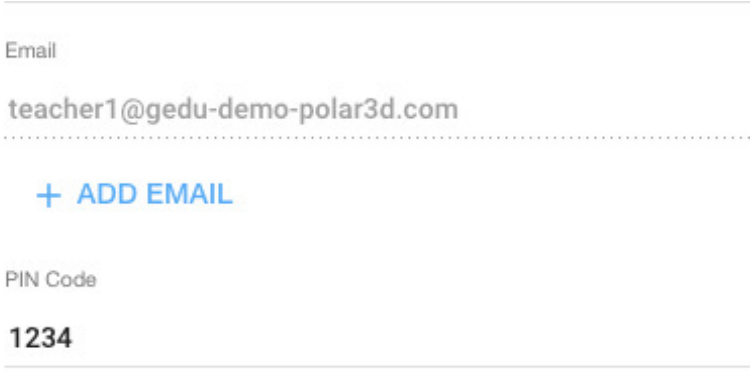


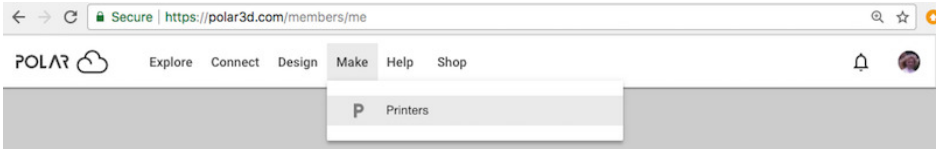
Figure 1.3: Polar Cloud account `SETTINGS` screen: close-up of `Email` and `PIN Code`



Shortly, you will be entering the information shown in Figure 1.3 into your Dremel printer's configuration: see Figure 2.7 and Figure 2.9.

But now for context (and to be able to compare later, *after* you've added your Dremel 3D45 to your Polar Cloud account), let's take a look at what your Polar Cloud list of printers might look like *before* you connect your Dremel 3D45 to your Polar Cloud account. When logged in to the Polar Cloud, expand the top menu and under "`Make`", select "`Printers`"; see for instance Figure 1.4.

Figure 1.4: Polar Cloud main menu `Make` → `Printers` (on large display)



If you are using a device with a narrow display (such as a smart phone), then instead of seeing menu tabs along the top

of the screen as in Figure 1.4, you will see an expandable menu icon at the upper left of the screen, see Figure 1.5. Click the menu icon to expand the menu, and then under "`Make`", click "`Printers`"; see Figure 1.6.

Figure 1.5: Polar Cloud main menu icon on small displays

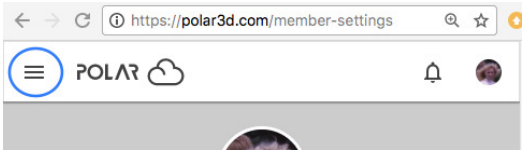
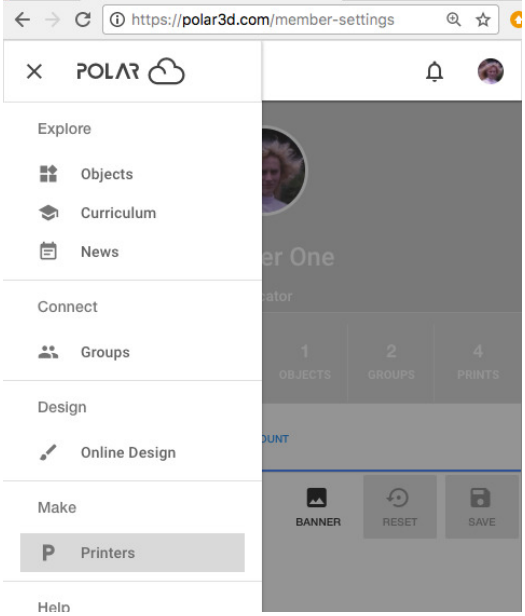


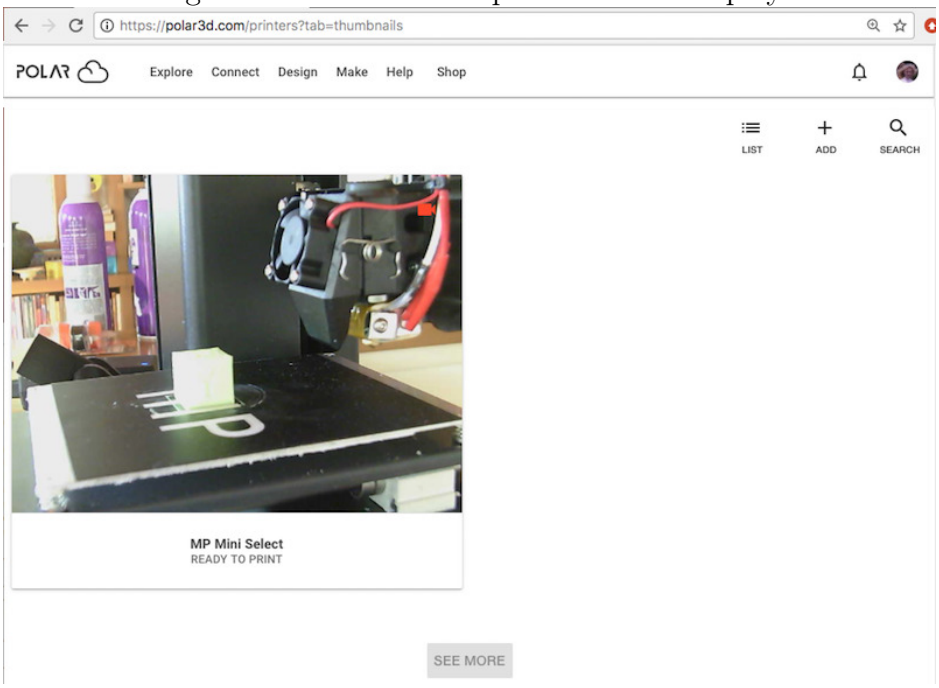
Figure 1.6: Polar Cloud main menu `Make` → `Printers` (on narrow display)



Selecting display of your printers in the Polar Cloud will bring up a screen that might appear something like that shown in Figure 1.7. (Figure 1.7 shows the "`TILES`" display of printers via image tiles; if you click "`LIST`", you will instead see any printers listed via a text list.) In this example, the account

already has one printer controlled via OctoPrint, but does not yet have a Dremel printer connected!

Figure 1.7: Polar Cloud printer `TILES` display



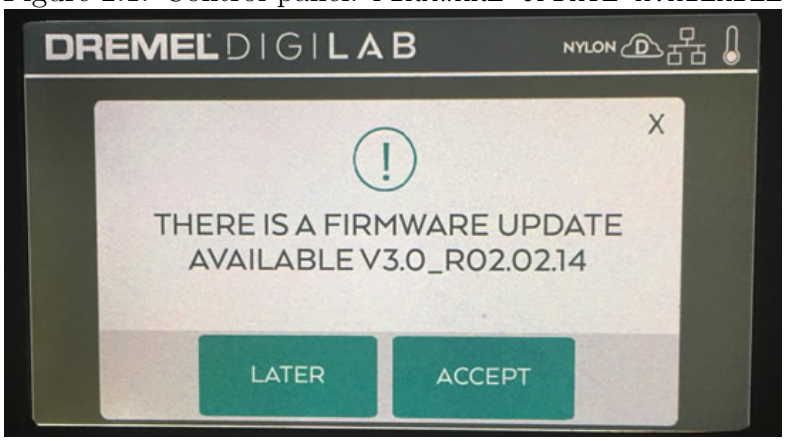
Chapter 2

Connect to the Polar Cloud

If you have not already done so, connect your Dremel 3D45 printer to a local network; see Section 1.1.

Then, when you power on (rocker switch on the right hand side of) your network-connected Dremel 3D45 printer, the printer's control panel touch screen may display a screen such as shown in Figure 2.1, indicating that there is a Dremel firmware update available for your printer.

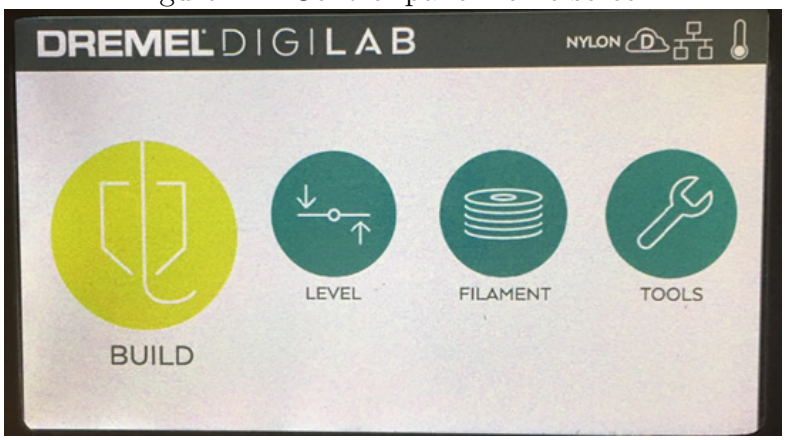
Figure 2.1: Control panel: `FIRMWARE UPDATE AVAILABLE`



If such a screen appears, then for the moment select "LATER", as some firmware updates could be problematic for Polar Cloud compatibility. (Check with both Dremel and Polar 3D before choosing to update your firmware, so as not to interfere with Polar Cloud compatibility.)

Figure 2.2 shows the control panel home screen; this is the first screen you will see if no firmware update is available for your printer, or is the screen you will see after declining to update your firmware.

Figure 2.2: Control panel home screen



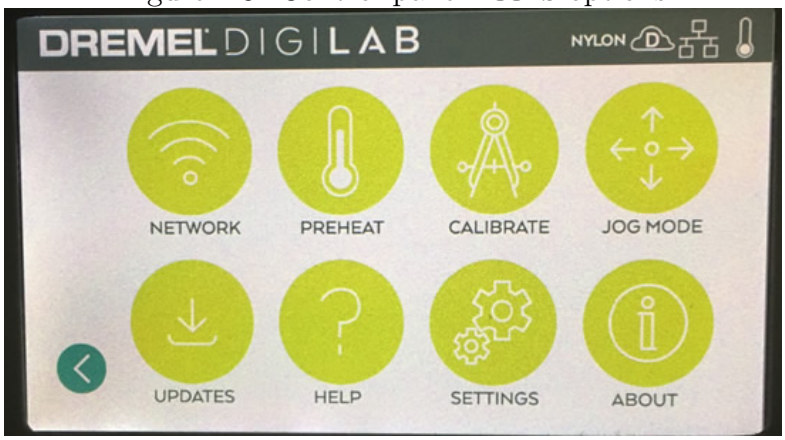
On this screen, note the icons at the top right. The icons shown in Figure 2.2 indicate, from left to right:

- filament type – the printer has detected that nylon filament has been loaded.
- cloud-based software – the cloud with a "D" inside indicates that the printer is currently connected to the Dremel cloud.
- network type – the printer is currently connected over Ethernet.

- thermometer – the low temperature thermometer icon indicates that the printer's extruder and/or build platform are currently cool.

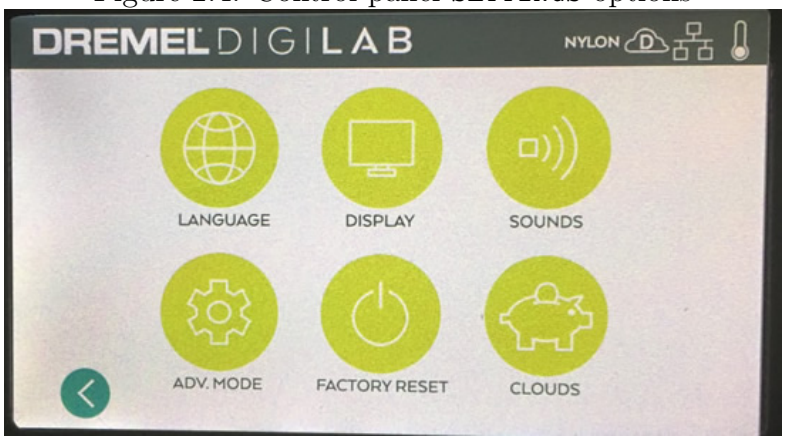
To begin configuration of Polar Cloud connection, at the control panel home screen, select "`TOOLS`"; that will take you to the screen shown in Figure 2.3.

Figure 2.3: Control panel `TOOLS` options



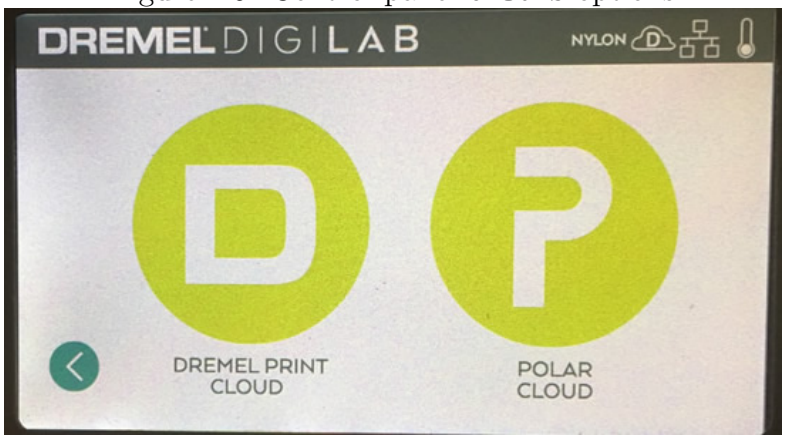
At the screen shown in Figure 2.3, select "`SETTINGS`"; that will take you to the screen shown in Figure 2.4.

Figure 2.4: Control panel `SETTINGS` options



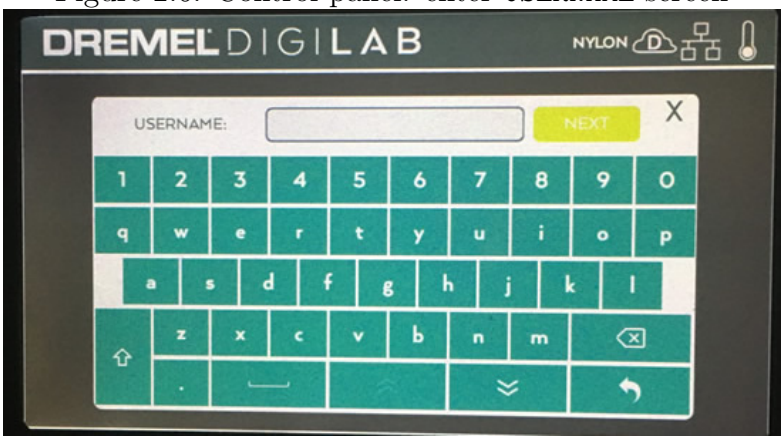
At the screen shown in Figure 2.4, select "`CLOUDS`"; that will take you to the screen shown in Figure 2.5.

Figure 2.5: Control panel `CLOUDS` options



Select "`POLAR CLOUD`"; that will take you to the screen shown in Figure 2.6.

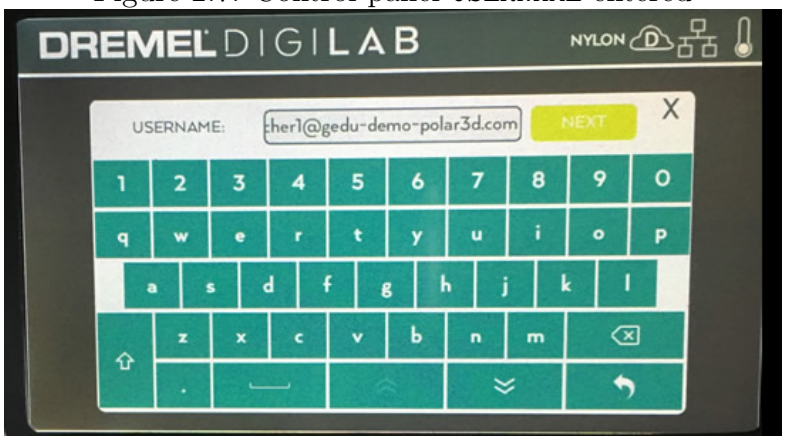
Figure 2.6: Control panel: enter `USERNAME` screen



At the enter "`USERNAME`" screen, enter the email address[1] associated with your Polar Cloud account (as seen in Figure 1.3); Figure 2.7 shows an example of the Dremel printer "`USERNAME`" entry screen with an email address typed in. Note that to enter "special" characters (such as the at character, `@`, or a hypen, `-`) you will need to press the double-down-arrow key (to get access to a screen of special characters).

[1]Note that if your Polar Cloud account has more than one email address associated with it, you may enter any of the email addresses associated with the account – although the original, primary email address associated with the Polar Cloud account is most commonly used.

Figure 2.7: Control panel `USERNAME` entered



Once you have finished typing in an email address associated with your Polar Cloud account, press the "`NEXT`" key; that will take you to the screen shown in Figure 2.8.

Figure 2.8: Control panel: enter `PIN` screen

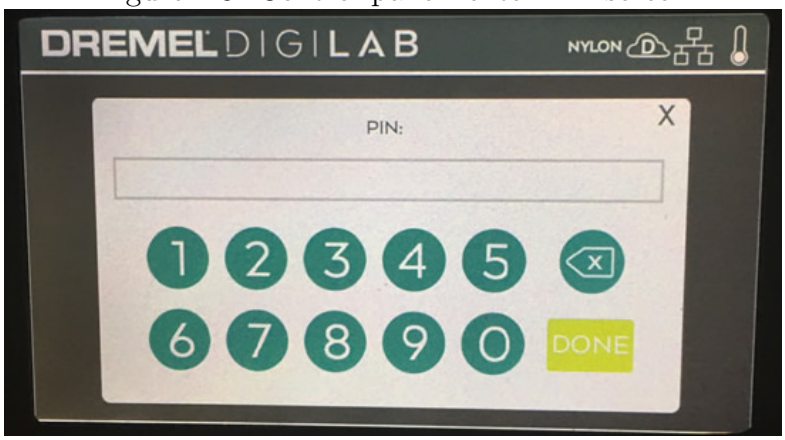
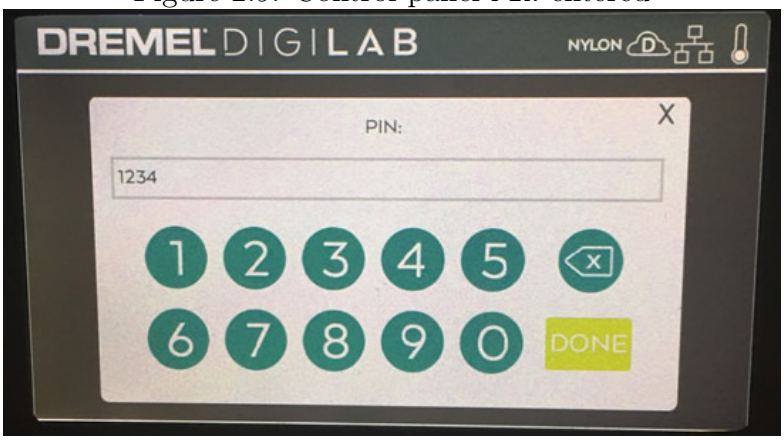
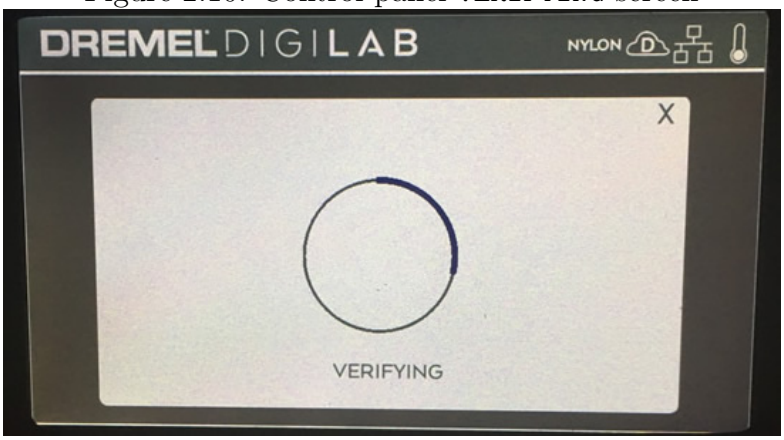


Figure 2.9: Control panel `PIN` entered



Enter your Polar Cloud account "`PIN Code`" (see for instance Figure 1.3) at the Dremel control panel "`PIN`" screen, as shown in Figure 2.9, and then press "`DONE`". After you press "`DONE`", you will see a "`VERIFYING`" screen, as shown in Figure 2.10.

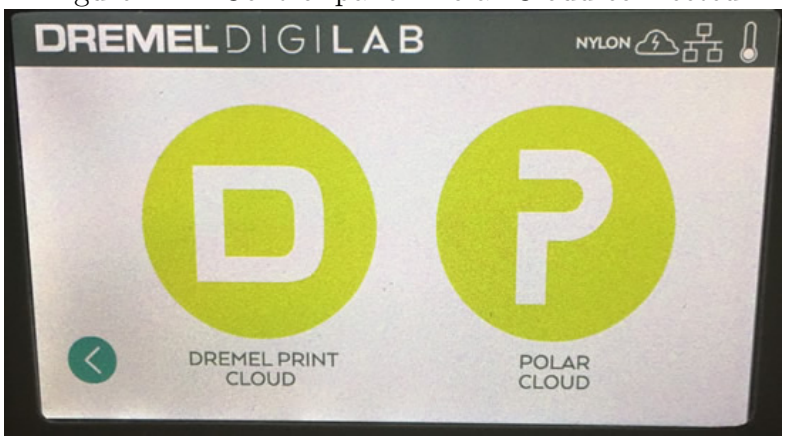
Figure 2.10: Control panel `VERIFYING` screen



If you entered your Polar Cloud account details correctly and your Dremel printer was able to verify that it successfully registered itself to your account in the Polar Cloud, then you will

return to the "CLOUDS" screen, but now the cloud icon will be updated indicating Polar Cloud connection; see Figure 2.11. (If instead you see an error screen, as in Figure 2.16, you likely have mis-entered your "Email" or "PIN Code"; see Section 2.2.)

Figure 2.11: Control panel: Polar Cloud connected



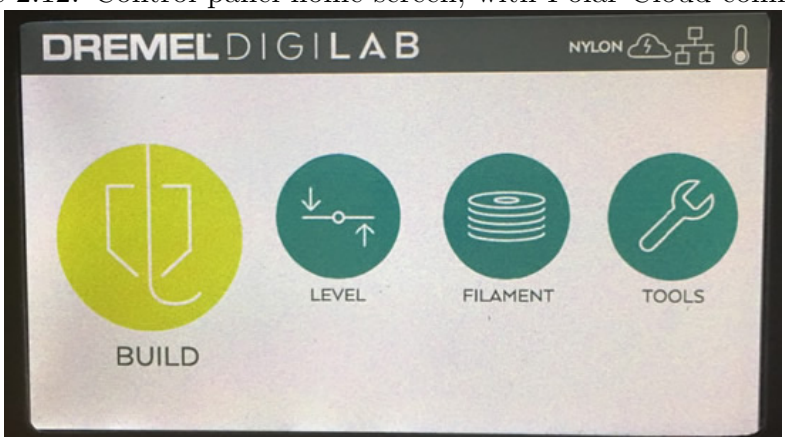
Note that a cloud icon with a lightning bolt (as shown in Figure 2.11 and Figure 2.12) means that the printer is connected to both the Dremel cloud and the Polar Cloud; a cloud icon with a "P" inside would indicate that the printer was connected *only* to the Polar Cloud (but not to the Dremel cloud).

Note that if the cloud icon continues to show a "D" inside, and does not change to showing a lightning bolt inside, that indicates that the printer, although connected to the Dremel cloud (so enjoying an Internet connection) has not been able to connect to the Polar Cloud. This likely means that your local network blocks outgoing TCP ports 80 and/or 443; you will probably need to talk to your network or IT administrator. See http://about.polar3d.com/yellow3d.

Press the back arrow key (towards the lower right of the con-

trol panel "CLOUDS" screen, as shown in Figure 2.11) to return to the control panel home screen, as shown in Figure 2.12.

Figure 2.12: Control panel home screen, with Polar Cloud connection

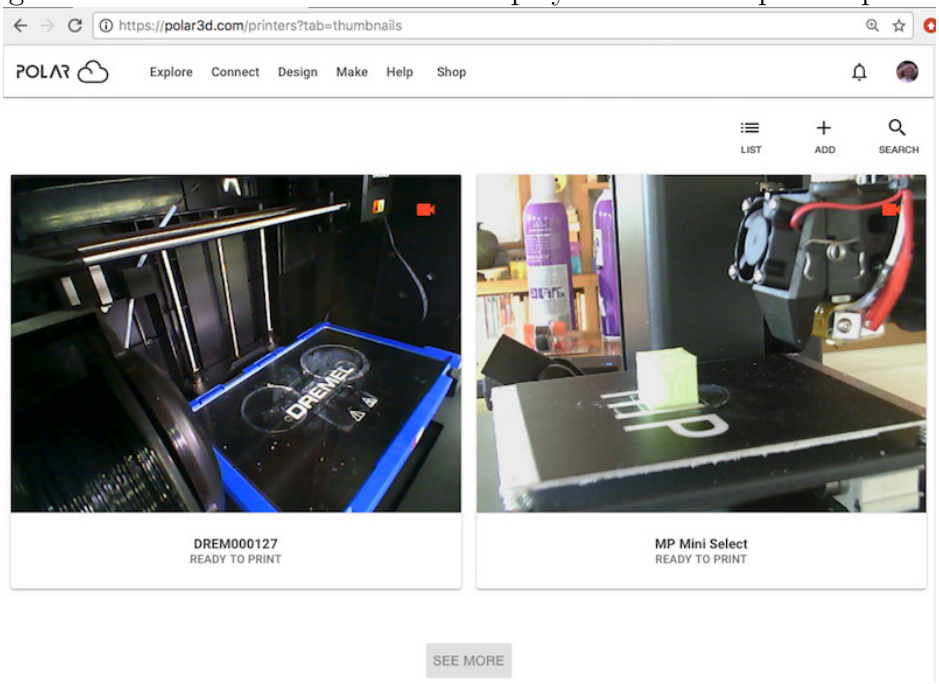


Now your printer is registered in the Polar Cloud!

2.1 Viewing and managing your Dremel 3D45 printer in the Polar Cloud

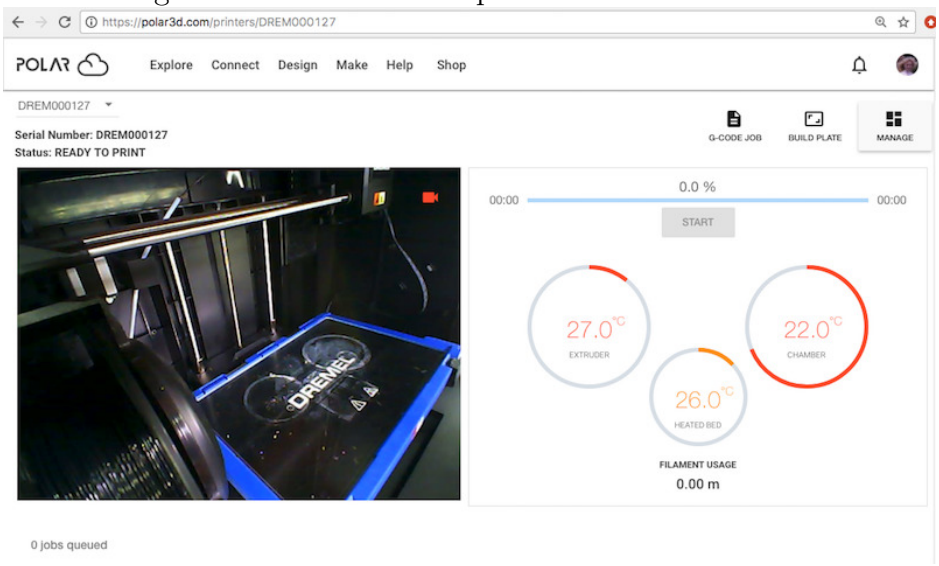
Now that you have added your Dremel 3D45 printer to your Polar Cloud account, you may view and control it from the Polar Cloud. If you now view your printers in the Polar Cloud, (from any Polar Cloud screen, expand the main left-hand menu and click "PRINTERS"), your Dremel printer will be present; see for instance Figure 2.13 (and compare it to Figure 1.7).

Figure 2.13: Polar Cloud `PRINTERS` display with Dremel printer present



Clicking on the image of the Dremel printer will take you to the printer dashboard screen; see Figure 2.14.

Figure 2.14: Polar Cloud printer dashboard screen

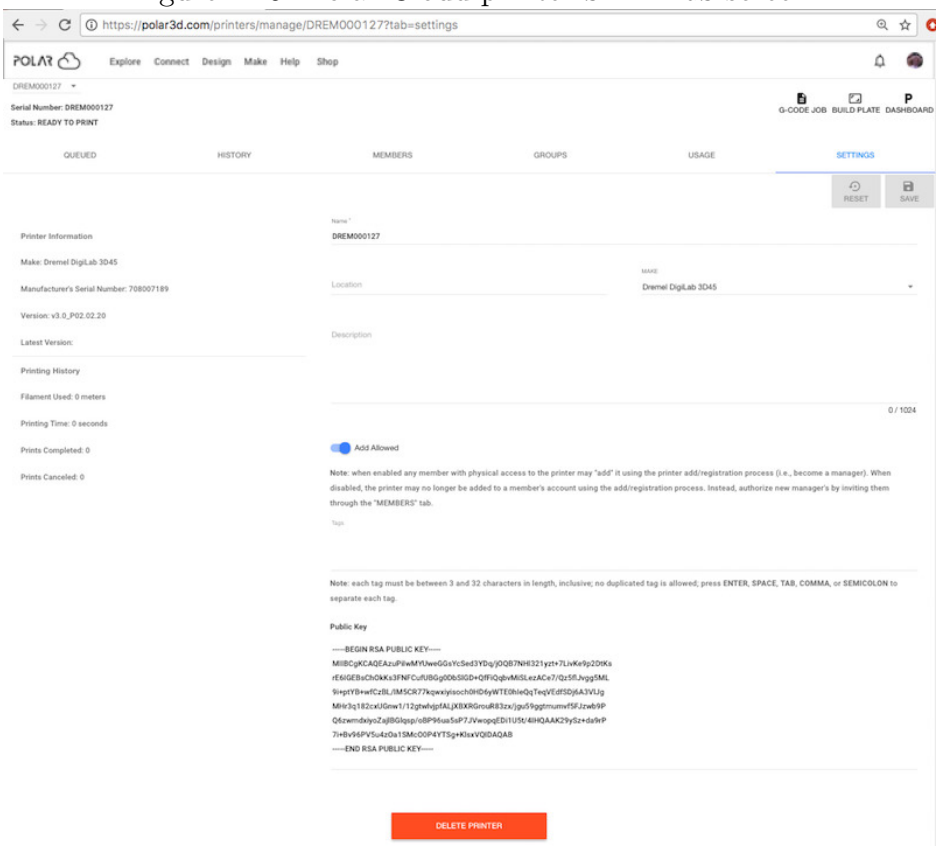


The printer dashboard screen is a main control screen for your printer in the Polar Cloud; at this screen you may view the current "`Status`" of the printer ("`READY TO PRINT`" in Figure 2.14), view the camera view of what the printer is currently doing, view the list of jobs queued to the printer (none yet, in Figure 2.14), adjust temperature via the temperature dials (note that these temperature dials are only active if you configure your Dremel printer to allow the Polar Cloud to override the printer's own normal settings – see Chapter 3), "`START`" printing a queued job, go to the virtual "`BUILD PLATE`", *etc.*; see the *Polar Cloud Guide* for detailed discussion of the printer dashboard screen.

In particular, clicking the "`MANAGE`" button towards the top right of the printer's dashboard screen (see Figure 2.14) will take you to the printer's "`MANAGE`" screen, which has a number of tabs along the top for selecting different management functions;

clicking "SETTINGS" will take you to the printer's "SETTINGS" screen, as shown for instance in Figure 2.15.

Figure 2.15: Polar Cloud printer SETTINGS screen



On the printer "SETTINGS" screen, note that by default, Dremel printers are given a "Name" corresponding to their Polar Cloud serial number ("DREM" plus six digits); if you wish, you can give your printer a more user-friendly name here, enter a "Location" (perhaps a building name and/or room number), or add "Description" text (which may be helpful if you end up with access to a lot of printers and you want to more conveniently search for this particular printer). If you do make any changes at this screen,

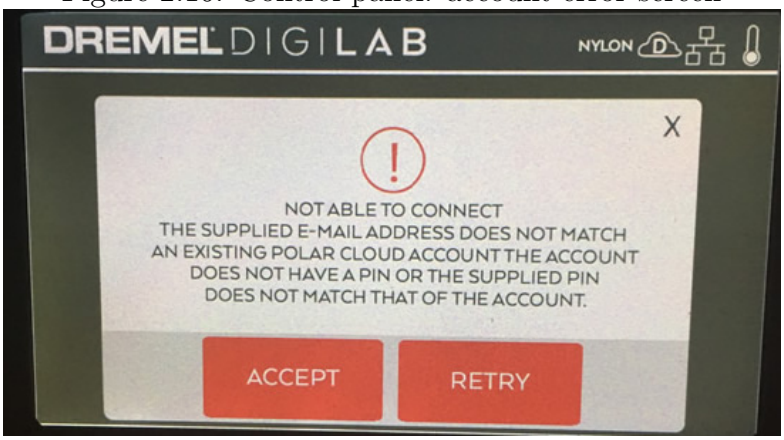
be sure to click the "SAVE" button (towards the top right – it will turn red instead of grey when there are changes to be saved) after making your changes.

Note: Do *not* alter the "Public Key" field (the very long field towards the bottom of the screen); that public key is generated during the registration of the printer in the Polar Cloud and then it (and the corresponding private key stored on the printer) are used to authenticate subsequent communications between the printer and the Polar Cloud.

2.2 Troubleshooting

If you mis-enter your Polar Cloud "Email" address or "PIN Code" (Figure 2.7 or Figure 2.9), then upon pressing "DONE", after the "VERIFYING" screen (Figure 2.10) instead of a success you will see an error screen as shown in Figure 2.16. Press "ACCEPT" at this error screen to return to the entry screens (Figure 2.6 and Figure 2.8) where you should re-enter your Polar Cloud information, double-checking that you have entered it correctly. (Note that the Dremel control panel "RETRY" key causes the printer to attempt the Polar Cloud connection again using the previously entered Polar Cloud account information – use "RETRY" only if you think the network connection may have had a blip.)

Figure 2.16: Control panel: account error screen



Tips: Double-check the spelling of your email address and particularly that you properly entered any special characters; also, if you changed your Polar Cloud "`PIN Code`" in preparation for registering your Dremel printer, double-check that in the Polar Cloud you pressed "`SAVE`" at the account "`SETTINGS`" screen after making the change!

With successful connection of your Dremel 3D45 printer to the Polar Cloud, the cloud icon on the printer's control panel should show either a lightning bolt inside the cloud (meaning that the printer is connected to *both* the Dremel cloud and the Polar Cloud) or a "P" inside the cloud (meaning that the printer is connected to *only* the Polar Cloud, not to the Dremel cloud).

If, after entering your Polar Cloud "`Email`" and "`PIN Code`" and pressing "`DONE`", you do not see the error screen of Figure 2.16 but nevertheless the cloud icon continues to show a "`D`" inside rather than changing to showing a lightning bolt inside, that indicates that the printer, although connected to the

Dremel cloud (so enjoying an Internet connection) has not been able to connect to the Polar Cloud. This likely means that your local network blocks outgoing TCP ports 80 and/or 443; communication with the Polar Cloud requires use of these ports. In this case, you will probably need to talk to your network or IT administrator to have them open up access to those ports for your printer. Note that at the Dremel 3D45 printer's main menu, pressing "`TOOLS`" and then "`ABOUT`" should display information about your printer, including its MAC address; make a note of the MAC address as your network administrator may need that information. See http://about.polar3d.com/yellow3d for some additional discussion.

If you do not see any cloud icon, even though either an Ethernet icon or (sufficiently strong) WiFi icon is displayed, that suggests that while the printer is connected to a local network, that local network is not (currently) enjoying an Internet connection. You cannot connect to Internet cloud-based services (such as the Dremel cloud or Polar Cloud) without a reliable Internet connection: your network or IT administrator may need to investigate your site's Internet connectivity.

Finally, note that captive portal Internet access (such as commonly offered at airports, coffee shops, business centers, *etc.*), will not suffice for a printer's connection, as the printer cannot navigate through "accepting" terms of such access.

Chapter 3

Honor Polar Cloud PRINT SETTINGS

The Dremel 3D45 printer is a rather automated printer. In particular, the printer detects the type of filament loaded, and then internally sets various printing options, such as temperature and fan speed, to correspond to that type of filament. The printer's internal settings are typically quite satisfactory. However, if you are using the Polar Cloud to control your printer, you may instead want to use Polar Cloud slicing profiles (collections of print settings – six slicing profiles are provided in the Polar Cloud for the Dremel 3D45 printer), as well as be able to further adjust such settings through the Polar Cloud.

To allow the Polar Cloud to fully override the Dremel printer's internal settings with Polar Cloud "PRINT SETTINGS", or override the printer's automatic temperature settings via the Polar Cloud printer dashboard temperature dials, you must configure your printer as follows. From the control panel main screen, select "TOOLS", then select "SETTINGS", then "ADV MODE" (visible in Figure 2.4 as the option at the lower left). Then turn on

"PRIORITIZE G-CODE SETTINGS" (meaning: prioritize the Polar Cloud's explicit settings, such as temperature settings, over the printer's internal defaults) by sliding the switch to the left, as shown in Figure 3.1. You will then need to press "ACCEPT" to confirm this setting; see Figure 3.2.

Figure 3.1: Control panel: PRIORITIZE G-CODE SETTINGS

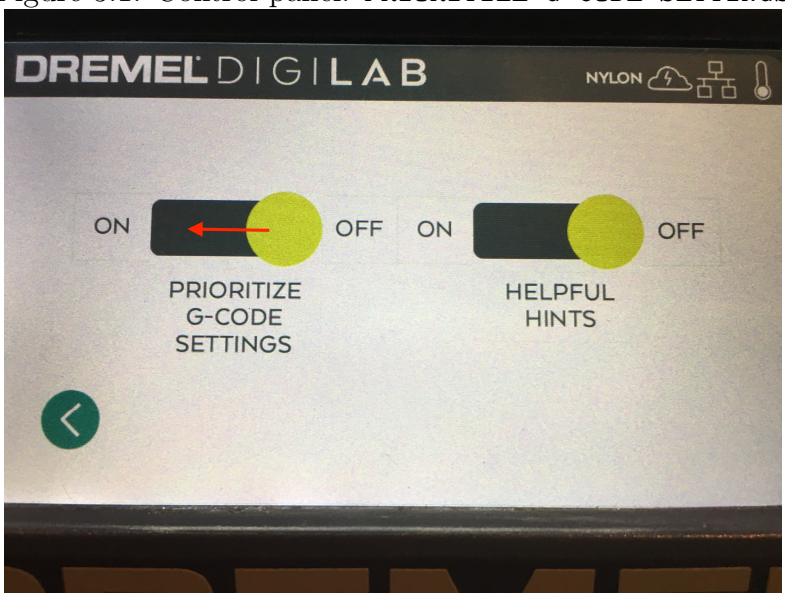
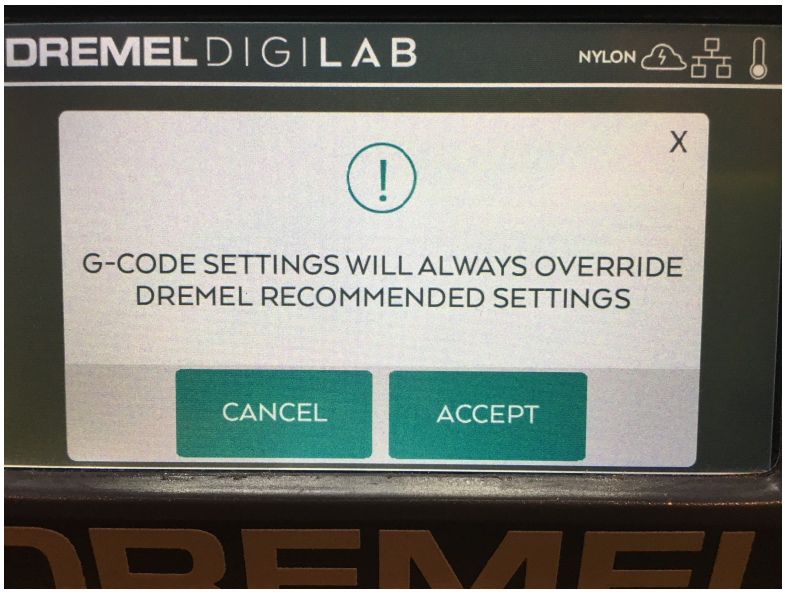


Figure 3.2: Control panel ACCEPT to confirm override of printer internal settings



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