



Connection Validation™ (CV) technology helps operators achieve perfect solder joints by providing instant feedback on the intermetallic compound (IMC) formation

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INTRODUCTION

This document is an addendum to the [Connection Validation™ User Guide](#) covering the updates and new features included in the 2022 CV Firmware Upgrade.

For complete information on system hardware and software features, setup, technical specifications, and CV operation, refer to the User Guide.

UPGRADING TO THE LATEST FIRMWARE ON YOUR CV SYSTEM

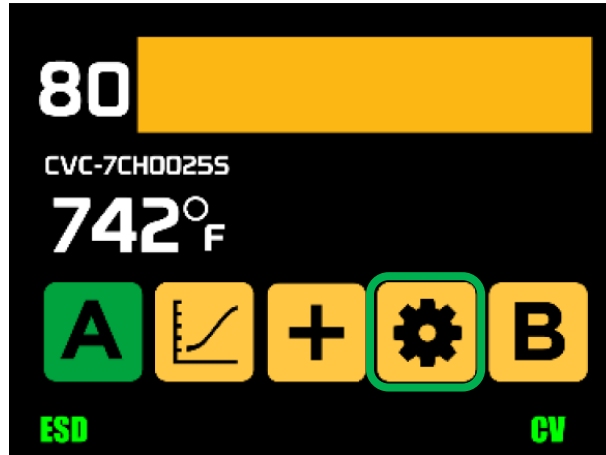
To take advantage of the new features of the latest CV firmware release, you will need to update your firmware.

- For a simplified explanation of the firmware updating process, download the document [“CV Firmware Update.”](#)
- For a more comprehensive explanation of the firmware update process, download this document [“CV-5200 Firmware Update Loading Instructions.”](#)



THE CONNECTION VALIDATION™ MAIN SCREEN

To get to the new CV features in this upgrade, press the Settings/Setup icon.



Main Screen

SETTINGS SCREEN

Many of the main functions of the Connection Validation™ system are controlled via the Settings Screen.

Here is a list of the new features:

1. Cartridge Optimization System (New)
2. Time Out Settings (New)
3. Allowed Cartridge Settings (Updated)
4. Sleep Timer (Updated)
5. Connection Validation™ Mode Settings (New)



Settings Screen

We'll go through the buttons in the order they appear on the Settings Screen to get a clearer understanding of CV's functionality.

CARTRIDGE OPTIMIZATION SYSTEM (NEW)

New to the CV-5200 is a Cartridge Optimization System for precise cartridge evaluation and logging, and precision sleep threshold detection.



To get the most accurate performance from the Connection Validation™ system, it is recommended that each of your cartridges be put through the optimization procedure before use.

The procedure records the cartridge category (Standard, Ultrafine, or High Thermal Demand) and temperature rating, and quickly evaluates each cartridge's exact impedance to best pass precise information through the CV system.

PAIRING A TIP-CARTRIDGE WITH THE CV SYSTEM

The first time a new tip-cartridge type is inserted into the handpiece, you will be prompted to place the handpiece into the sleeper stand. Press the image of the soldering stand on the CV touchscreen. The pairing process should be complete in 4 seconds or less. Once pairing is complete, you will not need to pair that cartridge again.

TIME OUT SETTINGS (NEW)

The Time Out Settings screen is where you set the time-on-joint duration of the Timed Mode. In Timed Mode, the user or process manager sets an appropriate dwell time for each joint, based on the application and the temperature of the cartridge being used. The CV system times each time-on-joint and alerts the operator when they should remove the solder tip and move on.



The length of the time-on-joint is set within a range of 3 to 8 seconds (IPC Standard).

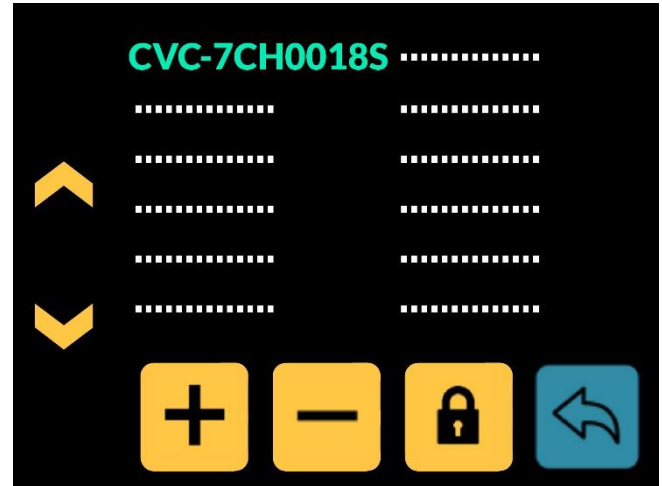
ALLOWED CARTRIDGE SETTINGS (UPDATED)

The CV system gives process engineers the ability to create a list of approved tip cartridges. Once the Allowed Cartridge Settings are



engaged, only cartridges on the list will function. Up to 12 cartridge configurations can be added to the list. Any cartridge inserted into the handpiece that is not on the list will prompt an error message.

With a cartridge inserted into the handpiece, press the Allowed Cartridge Settings icon. Press the [+] button to add a CV cartridge to the list. The inserted cartridge will be added to the Allowed list by its part number. When finished adding cartridges/part numbers, press the lock icon to engage the list, then exit the setup screen. (See page 11 of the User Guide for complete configuration instructions)



Allowed Cartridges List

Now only approved cartridges will be functional for the operators. (The list is only functional when operator passcodes are enabled)

SLEEP TIMER (UPDATED)

The Sleep Timer functions the same as in previous versions of the CV firmware, but now it has its own icon and settings screen.



Simply set the amount of time that will pass before the CV power unit goes to sleep, between 10 and 120 minutes (in 10-minute increments).

TIP WIPE SETTINGS

The Tip Wipe Settings make it possible to set a reminder for the operator to clean their soldering tip. Configurable between 10 and 200 seconds, at one second increments.



When the set time has passed, the symbol on the left fills the screen.

TEMPERATURE DISPLAY




Choose to display the system temperature in Fahrenheit or Celsius or turn the display off completely.



AUDIBLE ALERT SETTINGS

There are three settings for the Audible Alert: ON, OFF, and FAILURE ONLY.



-  **ON:** Audible alert upon completion of a solder cycle, in sync with the LED indicator light. Beeps in sync with Green LED (success) or buzzes in sync with Red LED (failure).
-  **FAILURE ONLY:** Only beeps when Connection Validation™ detects a solder joint failure (in sync with RED LED only).
-  **OFF:** No audible alert.

CONNECTION VALIDATION™ MODE SETTINGS (NEW)

There are new and updated CV user modes. Choose the user mode from the settings menu that best suits your unique production or training needs.

PRODUCTION MODE (Pcv)

As with Training Mode, the Connection Validation™ system verifies the IMC formation of each joint and signals the operator via the green handpiece LED and beep when a quality joint has been made.



In Production Mode, the Connection Validation™ system alerts the operator at the completion of the validation process by lighting the LED ring light built into the CV handpiece, by giving an (optional) audible signal, and with a message on the CV screen:

- **PASS:** Green LED light, indicating the joint has passed validation
- **ABORT:** Red LED light, indicating the tip was lifted off the joint too soon and the event did not pass validation
- **TIMEOUT:** Red LED light, indicating the tip has been on the joint too long. This feature is to help prevent the operator from delaminating the PCB or causing lift-off of the pad. This is a preprogrammed eight (8) second time out, based on IPC Standard J-STD-001.

Production Mode is a new advanced mode of Connection Validation™, with faster verification and more reliance on the operator to achieve a successful joint. This mode is for experienced operators who may have found the previous versions of CV too slow. (Not available in Dual Output Mode)

TIMED MODE

In Timed Mode, the user or process manager sets an appropriate time-on-joint, based on the application and the temperature of the cartridge being used. The CV system times the dwell time of each joint and alerts the operator when they should remove the solder tip and move on.



The length of the time-on-joint is set on the Timeout Settings screen (Icon 2), within a range of 3 to 8 seconds (IPC Standard).

This is a valuable mode when the desired temperature and exact dwell time can be determined in advance, to maintain the ultimate in consistency among the operators.

CV OFF

All Connection Validation™ systems are off. The CV unit operates like any other SmartHeat® system.



OPERATOR PASSCODE SETTINGS (UPDATED)

It is now possible for the Admin/Supervisor to assign 3 operators individual passcodes in Operator Passcode Settings. Each of the 3 operators is represented on the main screen by either one, two, or three stars.



By assigning these passcodes, it is easy to track who is logged in to each unit and control the parameters for each operator individually.*

*See page 8 of the CV User Guide

SYSTEM INFORMATION

Displays information about the CV system. Ex. No Calibration Required and information on ESD safety, ground monitor system, and surface resistivity.



SUPERVISOR PASSCODE LOCK/SETUP

This icon takes the Supervisor to the screen where they manage their own password and the passwords of up to 3 operators.



*See page 8 of the CV User Guide

EXIT SETTINGS MENU

Return to the CV Main Screen.



CONNECTION VALIDATION™ RESOURCES

[User Guide](#) | [Data Sheet](#) | [Tips & Cartridges Selection Guide](#)

[CV Firmware Update Guide](#) | [CV-5200 Firmware Update Loading Instructions](#)

Go to [Metcal.com](https://www.metcal.com) for more information on [Connection Validation™ Series Systems](#) or any of our soldering, desoldering, rework, fume extraction, and fluid dispensing products. Or [contact Metcal](#) for further assistance.