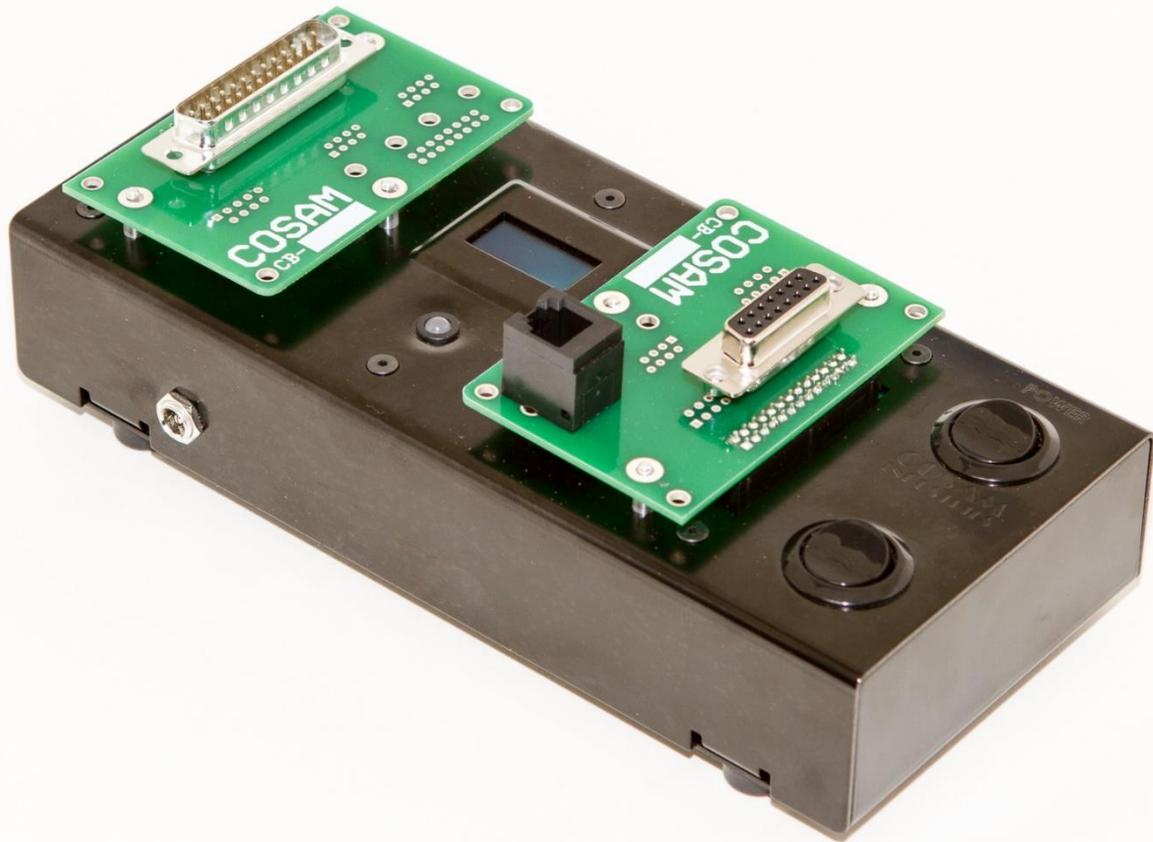




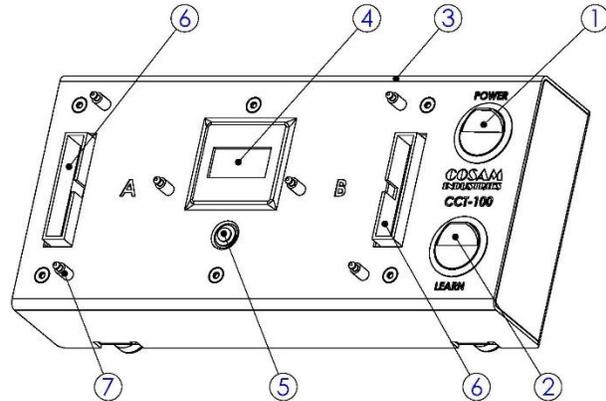
CCT-100 User's Guide



The CCT-100 is a very simple and intuitive cable verification device. It can be used by anyone with very little training. The system works by memorizing the connections of a known good cable and then comparing those connections to a single or group of test cables.

Identification:

1. Power Button
2. Learn Button
3. Power Connection (12V DC)
4. Display
5. Indicator light
6. Connector board ports
7. Connector board supports (6x)



Features:

- **Capable:** 52 Testpoints (Cables up to 26 wires) Detects Opens, Shorts, Miss-wires, Bad connections and Diode polarity.
- **Versatile:** Many standard connector boards available as well as a build-your-own option for specialized connectors.
- **Compact:** 7.75" x 3.5" x 2.0" (197mm x 89mm x 51mm)
- **Rugged:** Made from 18 gauge cold rolled steel
- **Fast:** Tests at speeds up to thirty times per second.
- **Intuitive:** Easy to read status updates shown on the clear and bright OLED display along with Simple Pass/Fail indication by both green/red LED and dual tone audio buzzer.

Quick Start

- 1) **PREPARE:** Install Connector Boards and/or interface cables and make sure no test cables are connected to the unit (During Power-up)
- 2) **POWER-UP:** Plug in the power cord and turn on the CCT-100. After passing a self-diagnostic check, the display will show “READY” if there is a cable stored in memory or “EMPTY” if there is not. The indicator light will be blue●.

WARNING: Make sure the cables you are testing are not attached to any type of power supply. Cables connected to a power supply or power storing device may cause personal injury through electric shock and will damage the CCT-100 and void the warrantee.

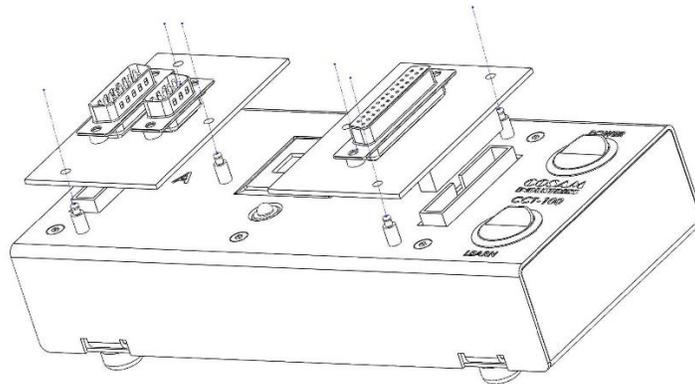
- 3) **LEARN:** Attach a “known good cable” □ to the connectors on the connector boards.
 - a. A green ● indicator light means the current cable matches the last cable stored in memory. The display will show a unique cable code.
 - b. A red ● indicator light means the CCT-100 has detected a cable is connected, but it does not match the last cable stored in memory. To store the currently connected cable in memory, press and release the “Learn” button. The indicator light should then turn green ● and a unique cable code will appear in the display.
 - c. {Optional} If this type of cable will be tested again at a future date, then the unique code should be recorded. At a future date, a “known good cable” will not be necessary. Simply compare the unique code of the current cable with the one that you have recorded. If they match, then the current cable on the tester is verified and the learn button can be pressed.
- 4) **TEST:** Remove the known good cable and connect a test cable
 - a. A green ● light indicates the test cable is wired the same as the cable stored in memory.
 - b. A red ● light indicates the test cable is not wired the same as the cable stored in memory.
- 5) **REPEAT:** Repeat step 4 for all other test cables.

□ How to establish a “known good cable” – There are several ways to establish a known good cable. The easiest way is to use a cable that is working in the application. If that is not practical, then the cable can be tested manually with a multi-meter or some other continuity measuring device. The good part is you will only have to do this once

for each cable type because you recorded the unique code in a log book. In the future you can verify correct wiring by matching the unique code to the one in your log book.

Detailed Operation Instructions:

- 1) Install connector boards (if Required)
 - a. Align the boards directly over the connectors and push straight down allowing the three alignment posts to pass thru the board. The alignment posts have ball shaped tops that allow the connector boards to be held in place without any additional hardware.



- 2) Make sure no cables are connected to the unit during Power-up. This allows the unit to run a diagnostic check and fully calibrate itself.
- 3) Plug in the power cord and turn the CCT-100 on.
 - a. The Display will briefly flash “Calibrate” as the unit runs a self-diagnostic test.
 - b. If calibration is successful, the display will show “READY” if there is a cable stored in memory or “EMPTY” if there is not.
 - i. The indicator light will be blue ● meaning the CCT-100 is not detecting continuity between any of its 52 test points.
 - c. If calibration fails (The above does not happen), then there is an internal problem and the unit must be returned for service.

NOTE: The CCT-100 keeps the last cable stored in its memory even when powered down.

WARNING: Make sure all cables are not attached to any type of power supply. Cables connected to a power supply may cause personal injury and will damage the CCT-100 and void the warrantee.

- 4) Attach a known good cable
 - a. The indicator light may be red ● or green ● and there will be a repeating audible beep. The beep tone coincides with the indicator light color allowing both audio and visual cable verification.
 - i. If the indicator light is red ●, then the CCT-100 is detecting a cable is connected, but does not match the last cable stored in memory. If you're sure the cable is wired correctly and want to store its connections into the CCT-100, then press and release the "Learn" Button. (This copies the cables connections into memory) The Indicator light will then change to green ● and the audible tone will change as well.
 - ii. If the indicator light is green ●, when the known good cable is connected, then the CCT-100 is detecting a cable is connected and it matches the last cable stored in memory. (In this case, the known good cable was the same as the last time the learn button was pressed.)

NOTE: At this point, you may wish to write down the Unique Cable Code shown on the display for later reference. {At the end of this guide is a template that can be used to record cable codes.} In the future when this type of cable it tested a known good cable will not be required. The cable can be verified by comparing the display of the current cable with the cable code written in the log. If the cable codes match, then you have a known good cable and can store the value into memory by pressing the learn button.

- 5) Disconnect the known good cable and connect a test cable
 - a. If the test cable is wired the same as the known good cable, then the indicator light will be green ● and the Cable Code shown in the display will match that of the known good cable.
 - b. If the test cable is not wired the same as the known good cable, then the indicator light will be red ● and the Cable Code shown in the display will not match that of the known good cable.
- 6) Continue testing all other test cables.

Theory

Cosam CCT-100 series testers work on a simple continuity principal. Each of the 52 test points are sequentially powered with a 5 volt signal and the remaining 51 test points are scanned for a voltage reading. All points over 3 volts are stored in memory. Then, the next pin is powered and all other points with a voltage reading are identified. The current point voltages are combined with the results of the previous points and after all 52 points have been evaluated, a geometric progression is used to obtain a unique value. Because the number of combinations (2^{51}) or a sexdecillion is too large to practically view, the value is converted to hexadecimal and then sent to the display.

By the method above, the CCT-100 looks for continuity in both directions. This is extremely valuable if the cable being tested has a diode or an LED embedded in it. Because diodes only allow current to flow in one direction, if they are installed backwards the entire circuit changes. For example, a cable to be tested has an LED installed between pin 7 and pin 43 with the anode connected to pin 7. When the CCT-100 evaluates the cable it will determine that there is continuity from pin 7 to pin 43, but will not see continuity in the reverse direction (pin 43 to pin 7). If the LED were installed backwards, the CCT-100 would detect it, fail the cable and display a different unique code.

Due to the fact that the CCT-100 works by measuring small voltages, it is very important that the cables being tested do not have any energy storing components in them. For example, if a cable for some reason had a capacitor inside of it, then the testing results would be erratic and if the capacitor was charged with a high voltage, then personal injury via electric shock as well as damage to the CCT-100 may occur.

Connector boards vs. Interface cables

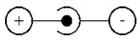
Connector boards provide the fastest and most trouble free testing. They are faster than interface cables because they only require one hand to install or eject. They are more reliable because they last longer. Interface cables, on the other hand are much less expensive and can be used with almost any type of cable connector. If you can't find a connector board for your application, then there are a couple of options.

- a) You can purchase a Build-your-Own connector board along with the mating connector to your cable. The Build-your-One option allows the use of any connector to be installed on a connector board. It will require you to drill and mount as well as wire the connector to the board.
- b) You can purchase an [interface cable](#) along with the mating connector to your cable. The interface cable option is the easiest and least expensive option to assemble, but is not as durable and will take longer to test than the Build-your-Own option.

How to make your own Interface cables

Making your own interface cables is a fast and simple process. You will need to purchase the mating connectors for the cables you will be testing as well as a cable to connect to the CCT-100.

Specifications:

- Input Voltage: The Power supply shipped with the CCT-100 is a standard 120/240VAC Class 2 US style plug. The connector is a 12VDC, center pin positive  5.5 mm x 2.1 mm and produces a minimum of 200mA.
- Test Voltage: 5 VDC
- Test Current: 15 mA Max
- Resistance: 50k Ω (\pm 10%)
- Temperature Range: -20°C to 60°C (-4°F to 140°F)
- Size: 7.75" x 3.5" x 1.5" (197mm x 89mm x 38mm)
- RoHS 2, China RoHS 2 and ECHA Reach (SVHC-173) Compliant

Maintenance

Tester Maintenance: The CCT tester requires no maintenance. If desired the outside surfaces may be cleaned with a mild cleaner. If debris accumulates on the connector board ports, a vacuum should be used to remove it.

Connector Board Maintenance: The contacts on all connector boards should be kept as clean as possible. After thousands of repeated insertion cycles the gold plating on the connectors will begin to wear off. As this occurs, higher connection resistances will also occur and at some point the connector board will need to be replaced



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REV: 7/7/2017

Trouble Shooting:

Condition	Possible Resolution
When unit is switched on, there is no power.	<ol style="list-style-type: none"> 1) The Power supply is defective. Make sure there is 12VDC from the power supply. Replace if necessary. 2) There is an internal problem with the CCT-100. Contact factory for repair or replacement
When unit is switched on, the indicator light is either red or green, but not Blue as it should be	<ol style="list-style-type: none"> 1) The CCT-100 is detecting that a cable is connected to the unit. Remove all test cables and connector boards and try again. If the condition is resolved, carefully inspect the connector boards for shorts. 2) If the condition isn't resolved, make sure there is no debris on the CCT-100 connectors.
The unit is displaying a different unique code for a known good cable.	<ol style="list-style-type: none"> 1) Swap the positions of the connector boards. If this doesn't work, then switch them back. 2) Make sure you are using the same connector boards, or transition cables as you were when the original unique code was recorded.

