

Firmware Version 3.1.0 and newer

OTT-2100-2\_Manual\_250718

# Cypress OTT-2100-2 Manual - Product Overview & Specifications

The OTT-2100-2 is a pair of units that test new or existing cable for use with an OSDP reader and access controller. Set one as the Test unit and the other as the Echo unit, then connect the units to each end of a cable run.

There are two test modes: 600-Test (short) and 6000-Test (long). Both tests simulate OSDP communication at each baud rate. Three status LEDs on the Test unit display results of the test per baud rate, which are selectable via DIP switches.

Along with testing OSDP cable runs, each unit can be used individually as an OTT-2100 COMSET tool. This enables quick and easy OSDP reader configuration without a tablet, computer, or access controller. Use a single unit to set the addresses and baud rates of OSDP readers before or during field installation.

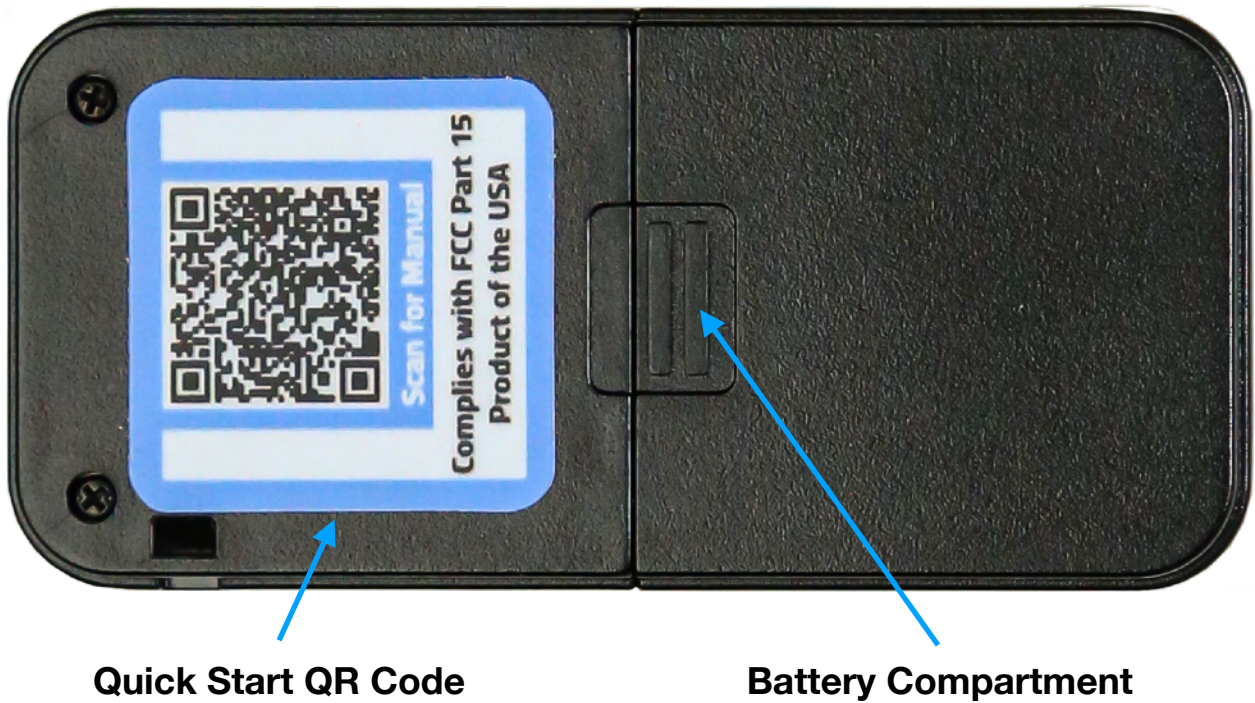
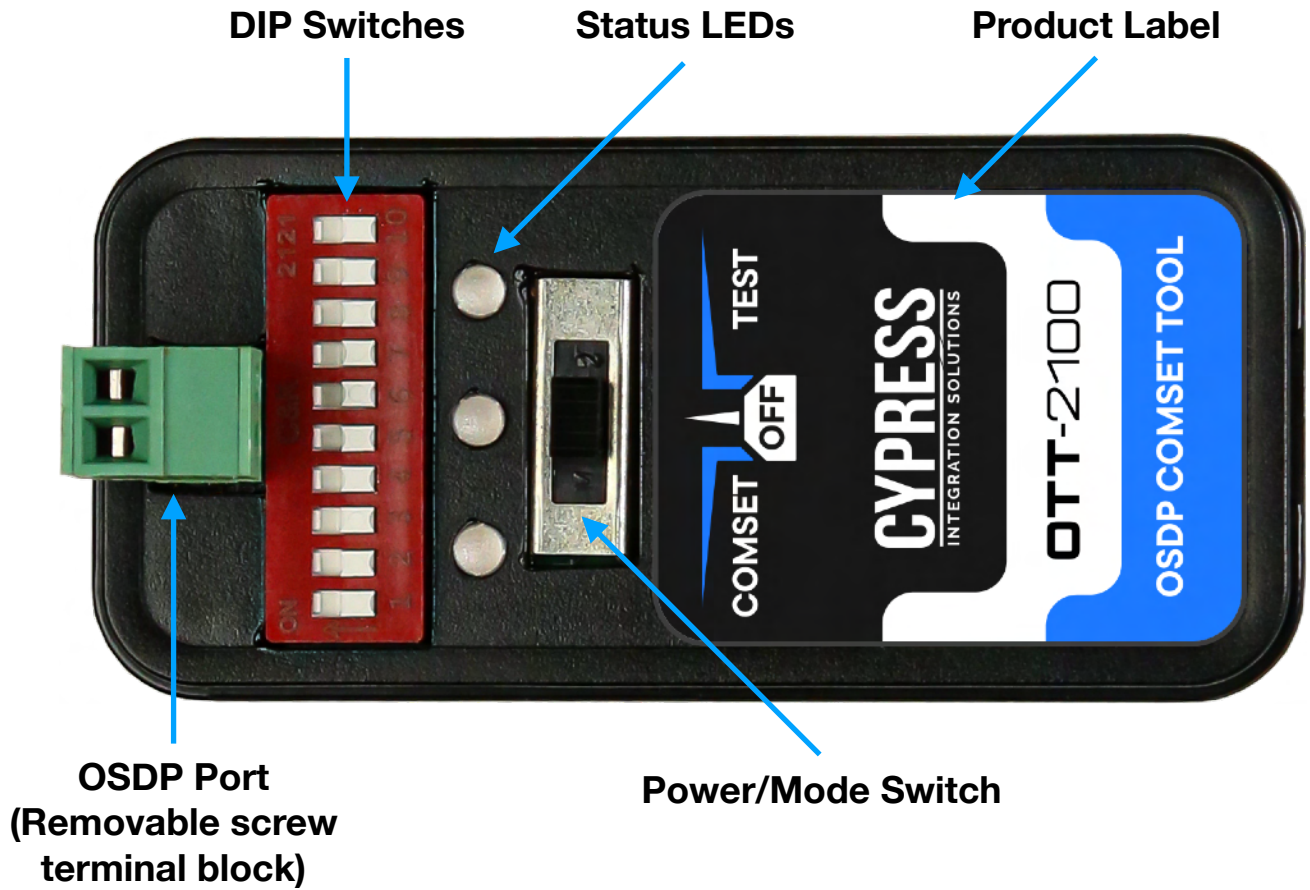
## Specifications

Part Number	Part Number	OTT-2100-2
	UPC	816684006029
Physical	Physical Dimensions (L x W x H)	3.00 x 1.375 x 0.975 inches   7.5 x 3.5 x 2.5 cm
	Weight	1 oz.   28.35 grams
Environmental	Operating Temperature Range	-40°F to 158°F   -40°C to 70°C
	Enclosure Rating	Not rated for water or dust intrusion
Electrical	Battery	3 VDC, 225 mAh
		CR2032 coin cell, non-rechargeable, user replaceable
		Lithium Manganese Dioxide (LiMnO <sub>2</sub> )
Additional Features	Test cable for use with OSDP devices	
	OSDP polarity switching to simplify connecting to OSDP readers.	
	Small, pocket size.	
	Field-serviceable battery.	
	Multiple operating modes: Cable testing and COMSET modes	

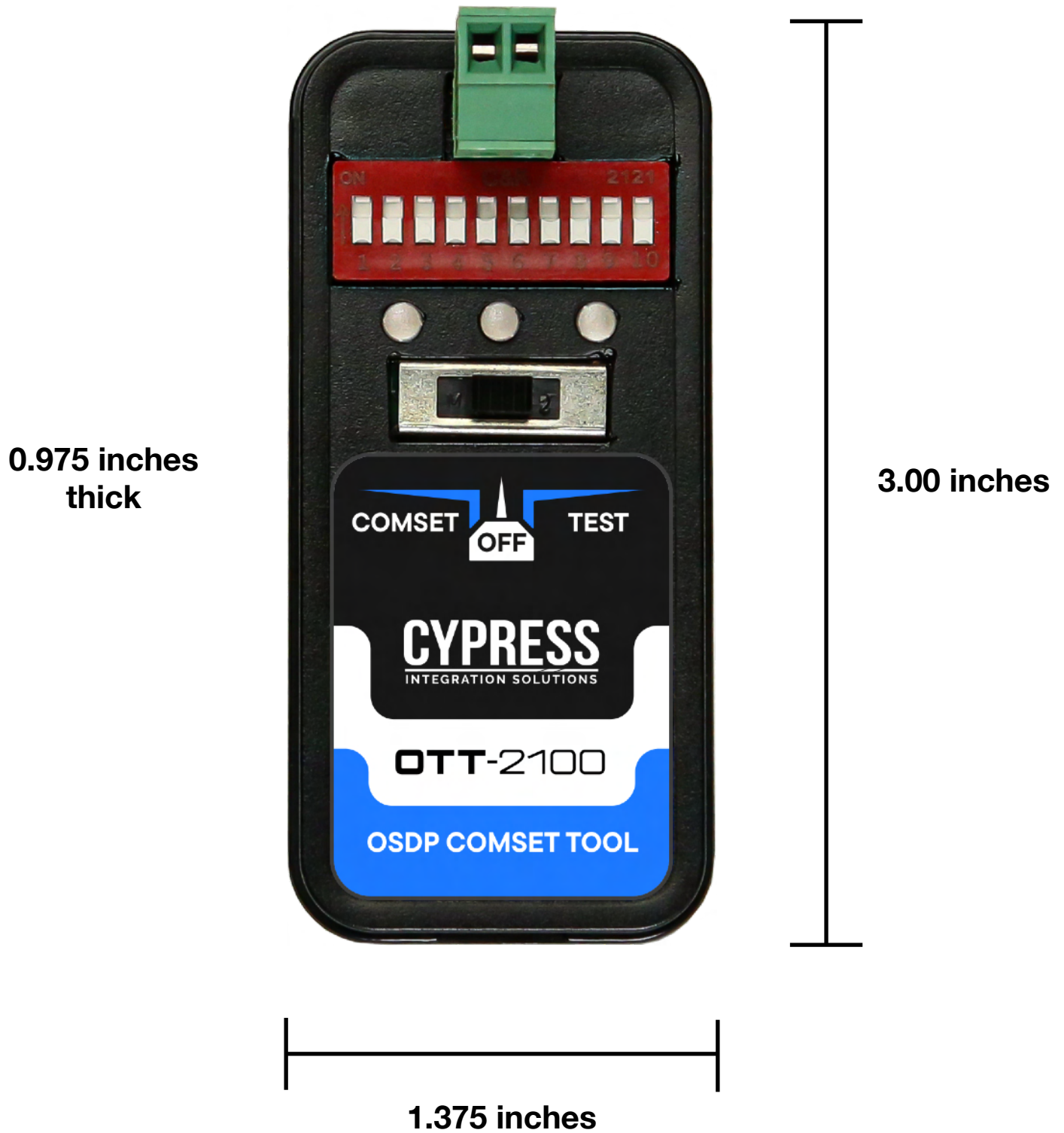
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## Cypress OTT-2100-2 Manual - Physical Features



## Cypress OTT-2100-2 Manual - Dimensions





## Cypress OTT-2100-2 Manual - Installing the Battery

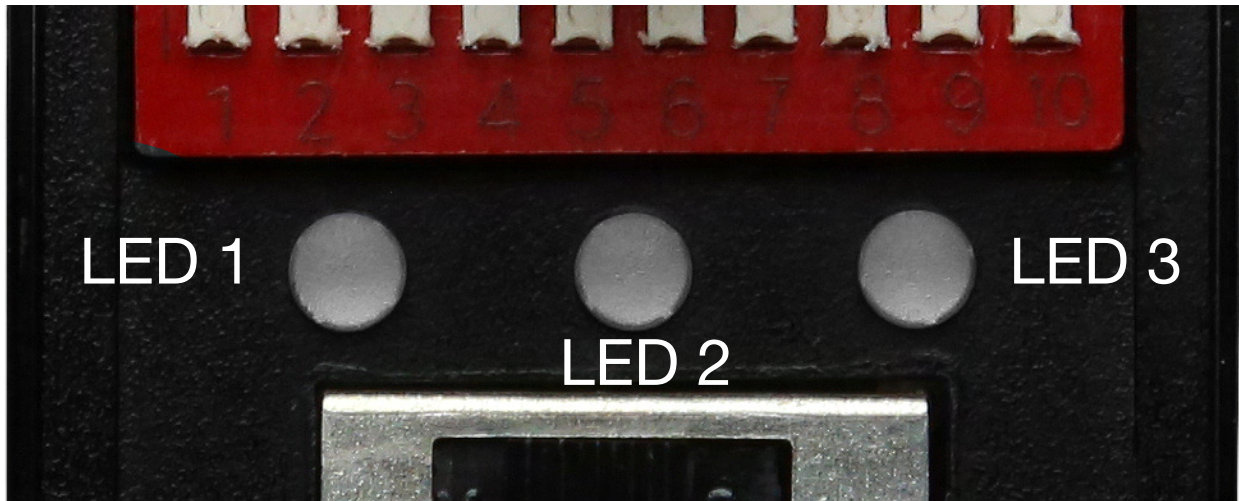
The OTT-2100-2 includes two CR2032 3V, 225 mAh coin cell batteries. These batteries must be installed by the user.

The battery compartment is on the back of the OTT-2100-2. The battery must be installed with the + side visible, as shown in the picture below.

The serial number and firmware version label are on the inside of the battery compartment cover.



## Cypress OTT-2100-2 Manual - Status LEDs



The OTT-2100-2 has three RGB LEDs that show the status of the device. The LED displays are different depending on the operating mode the unit is in. There are LED tables showing the states and meanings of the three LEDs in each of the operating mode sections of this manual. In Cable Test Mode, all 3 LEDs convey the ongoing test status and results upon test completion. For more info, please see pgs. 8-10.

In COMSET Mode, LED 1 will be solid red when the battery voltage is low. For more information, please see pgs. 14-15.

# Cypress OTT-2100-2 Manual - Cable Test Mode: Operation

## Overview

The OTT-2100-2 Cable Test Tool tests OSDP communication integrity over a cable run. The OTT-2100-2 is put into Cable Test Mode by pushing the Power/Mode Switch to the right position as indicated on the Product Label. One of the OTT-2100s is the Test unit, the other is the Echo unit. Any OTT-2100-2 device is capable of being either a Test unit or Echo unit. When in Test Mode, DIP switch 7 is used to set the OTT-2100-2 as a Test unit or Echo unit.

Cable Test Mode is used to simulate normal OSDP communication through a cable, at all standard OSDP baud rates, to determine packet loss. The Test unit transmits simulated OSDP messages and receives any messages returned by the Echo unit. The Echo unit retransmits OSDP messages back to the Test unit to simulate normal OSDP communication. After all of the simulated OSDP messages have been transmitted during the test, the Test unit calculates the total packet loss based on how many messages were returned intact.

Upon completion, the test results will be displayed on the Test unit. (Test results are not displayed on the Echo unit.) The results are displayed per baud rate, based on the user selection using DIP switches. Test results will remain available until the Test unit is power-cycled.

There are two different cable tests that can be run by the OTT-2100-2 units, the Basic Cable Test and the In-depth Cable Test. The type of test can be selected using DIP switch 5. The Basic Cable Test is selected when DIP switch 5 is OFF, and the In-depth Cable Test is selected when DIP switch 5 is ON.

**600 Cable Test:** The Basic Cable Test sends 100 messages on each of the six baud rates, totaling 600 messages. This test takes approximately 60 seconds to complete.

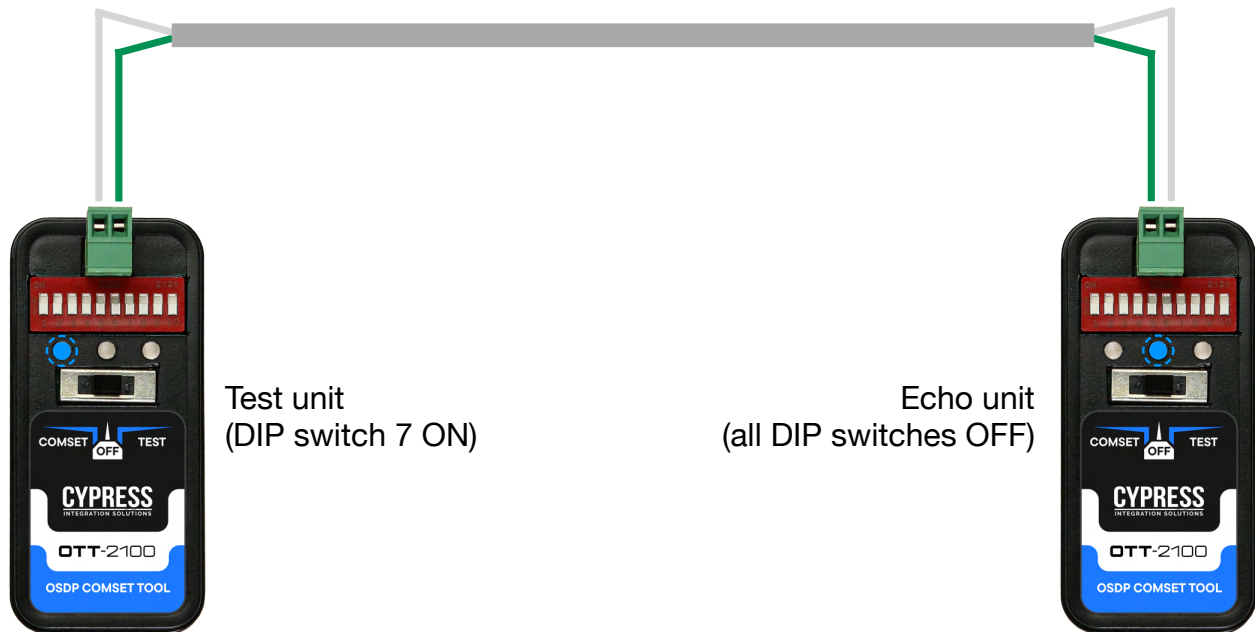
**6000 Cable Test:** The In-depth Cable Test sends 1000 messages on each of the six baud rates, totaling 6000 messages. This test takes approximately 5 minutes to complete.



## Cypress OTT-2100-2 Manual - Cable Test Mode: Operation (cont.)

### Running a Test:

1. Connect one OTT-2100-2 unit to a cable end; turn off all DIP switches to set this as the Echo unit.
2. Power on the Echo unit in Test Mode by pushing the Power/Mode Switch to the right.
3. Connect the second OTT-2100-2 unit to the other cable end; turn on DIP switch 7 to set this as the Test unit.
4. Power on the Test unit in Test Mode by pushing the Power/Mode Switch to the right.
  - a. If the OSDP polarity is flipped between the two OTT-2100-2 units, turn on DIP switch 6 on the Test unit to change the polarity. Flipped polarity is indicated by 3 red LEDs on the Test unit.
  - b. To run an in-depth cable test, turn on DIP switch 5 on the Test unit.
5. Wait near the Test unit until the Cable Test is complete. This should take approximately 60 seconds for a basic test, or approximately 5 minutes for an in-depth test.
6. LED 2 (center) on the Echo unit will be flashing blue during the test and after the test is complete.
7. LED 1 (left) on the Test unit will be flashing blue while the test is running. When the test is complete LED 1 on the Test unit will be solid green, and the results are displayed on LED 2 and LED 3.
8. When the test is complete, reference the Test Result LED Codes table to get the test results (see *pg. 10*). There is a test result for each baud rate, to view different baud rates change DIP switches 8-10.



## Cypress OTT-2100-2 Manual - Cable Test Mode: Operation (cont.)































### Reading the Test Result LEDs:

The Test unit LED 1 will rapidly flash blue to indicate that it is performing the test. The test is complete when Test unit LED 1 is either solid green (test complete), or solid red (test failed). The Echo unit LED 2 will flash blue during testing to indicate that it is listening for packets, the LEDs will not change state after the test is complete.

A failed test indicates that the Test unit did not receive any echoed OSDP messages from the Echo unit (no connection) or the OSDP polarity between the Test and Echo unit is reversed. To change the polarity on the Test unit, turn on DIP switch 6 and power cycle the unit to restart the test.

When the test is complete the Test unit will display the results on LEDs 2 and 3, as shown in the table below. The test results for one specific baud rate are displayed.

**Test Result LED Codes**

LED 1	LED 2	LED 3	Test Result
			0% Loss
			1% - 5% Loss
			6% - 10% Loss
			11% - 15% Loss
			16% - 20% Loss
			21% - 30% Loss
			31% - 40% Loss
			41% - 50% Loss
			Greater than 50% Loss
			Test failed: cut in cable or flipped polarity

## Cypress OTT-2100-2 Manual - Cable Test Mode: Operation (cont.)

### Viewing Results for Each Baud Rate

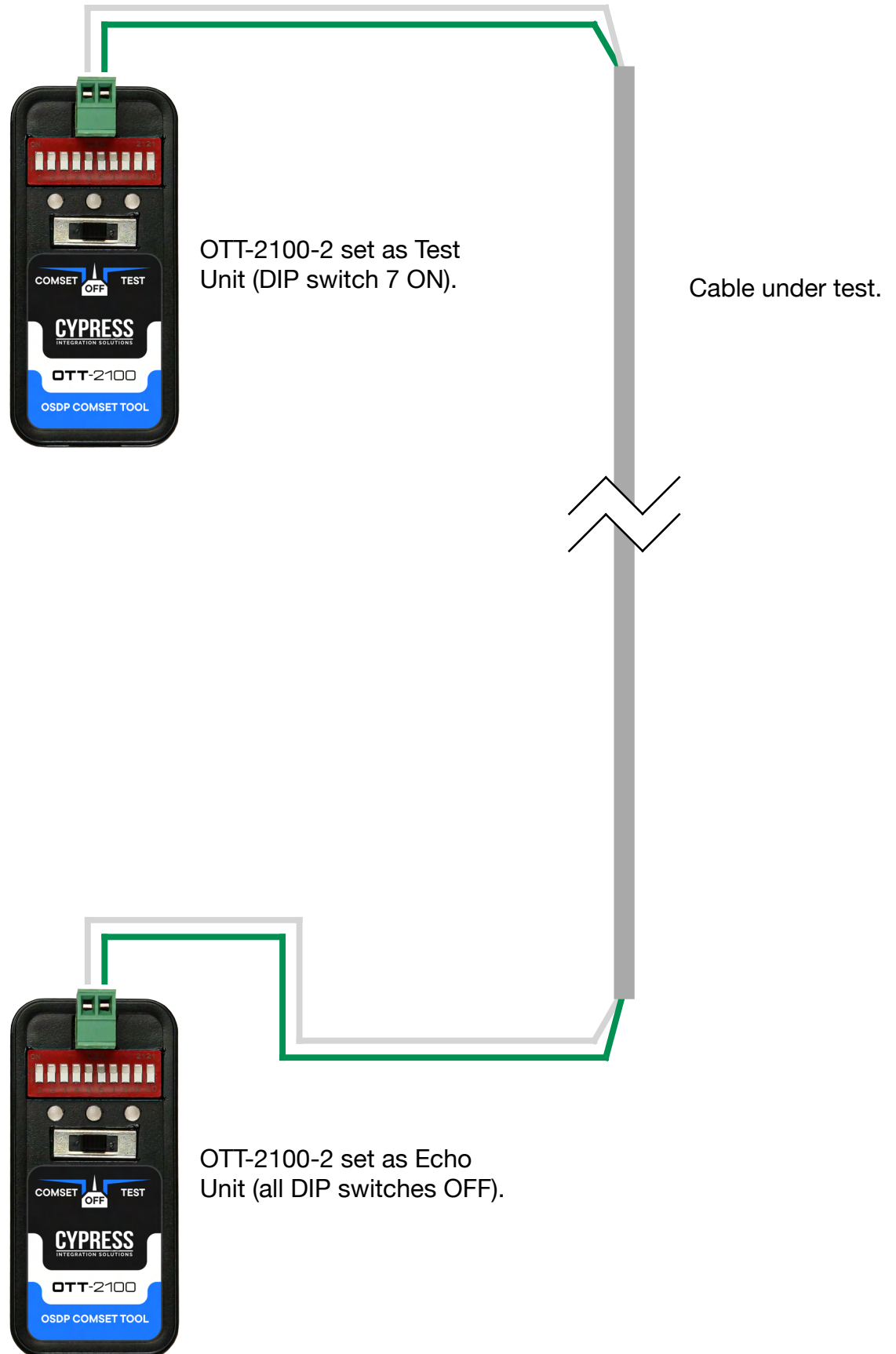
The test results are displayed per baud rate. The different results for each baud rate can be shown by changing DIP switches 8, 9, and 10. The displayed test results are changed in real time as the DIP switches are changed.

The table to the right shows how to set DIP switches 8, 9, and 10 to select the test results for the different baud rate.

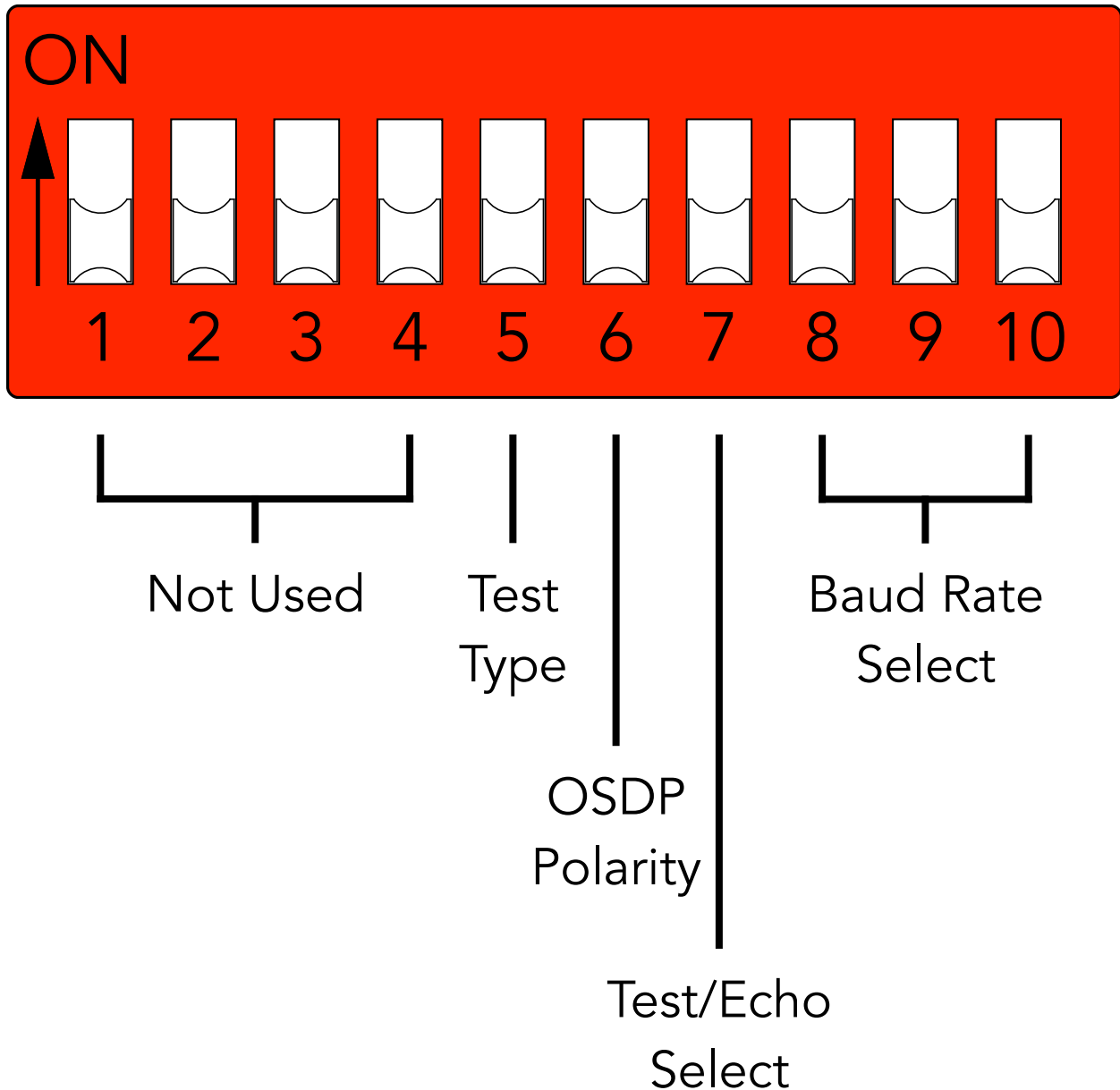
Baud Rate	8	9	10
9600			
19200			X
38400		X	
57600		X	X
115200	X		
230400	X		X

X = ON

## Cypress OTT-2100-2 Manual - Cable Test Mode: Wiring Diagram



## Cypress OTT-2100-2 Manual - Cable Test Mode: DIP Switch Overview



**DIP Switch 5** selects the type of cable test performed by the OTT-2100-2 Test unit in Cable Test Mode. When OFF, the Test unit runs the short, basic test. When ON, the Test unit runs the longer, in-depth test.

**DIP Switch 6** changes the OSDP data line polarity in Cable Test Mode.

**DIP Switch 7** sets the OTT-2100-2 unit as a Test or Echo unit for OSDP cable testing. When OFF, the OTT-2100-2 is set as the Echo unit. When ON, the OTT-2100-2 is set as the Test unit.

**DIP Switches 8, 9, & 10** control which test results are shown when the OSDP cable test is complete. LEDs 2 and 3 on the Test unit show the test results for a specific baud rate. Changing these DIP switches change the test results/ baud rate that is displayed by the LEDs.



# Cypress OTT-2100-2 Manual - COMSET Mode: Operation

## Overview

The OTT-2100-2 is put into COMSET Mode by pushing the Power/Mode Switch to the left position as indicated on the Product Label. Only one OSDP reader or PD can be connected to the OTT-2100-2 while in COMSET mode.

COMSET Mode is used to set the address and baud rate of a single OSDP reader or other Peripheral Device (PD). The desired address and baud rate can be set before the OTT-2100-2 is powered on in COMSET Mode, or while the OTT-2100-2 is powered on in COMSET Mode. When the DIP switches change while the OTT-2100-2 is powered on in COMSET Mode, it will restart the COMSET process with the new parameters automatically.

The OTT-2100-2 has an OSDP polarity switching feature, which allows the device to communicate with the reader or PD no matter the polarity of the connected OSDP lines.

When the OTT-2100-2 is connected to a PD and is powered on in COMSET Mode, it will do the following:

1. Attempt to communicate with the PD, regardless of the current address and baud rate configuration.
2. Attempt to set the PD's address and baud rate to the selected values.
3. Attempt to start a Secure Channel Session with the default OSDP Secure Channel Base Key (SCBK-D).

The table below shows the different LED states and meaning for those states for each of the 3 LEDs in COMSET Mode.

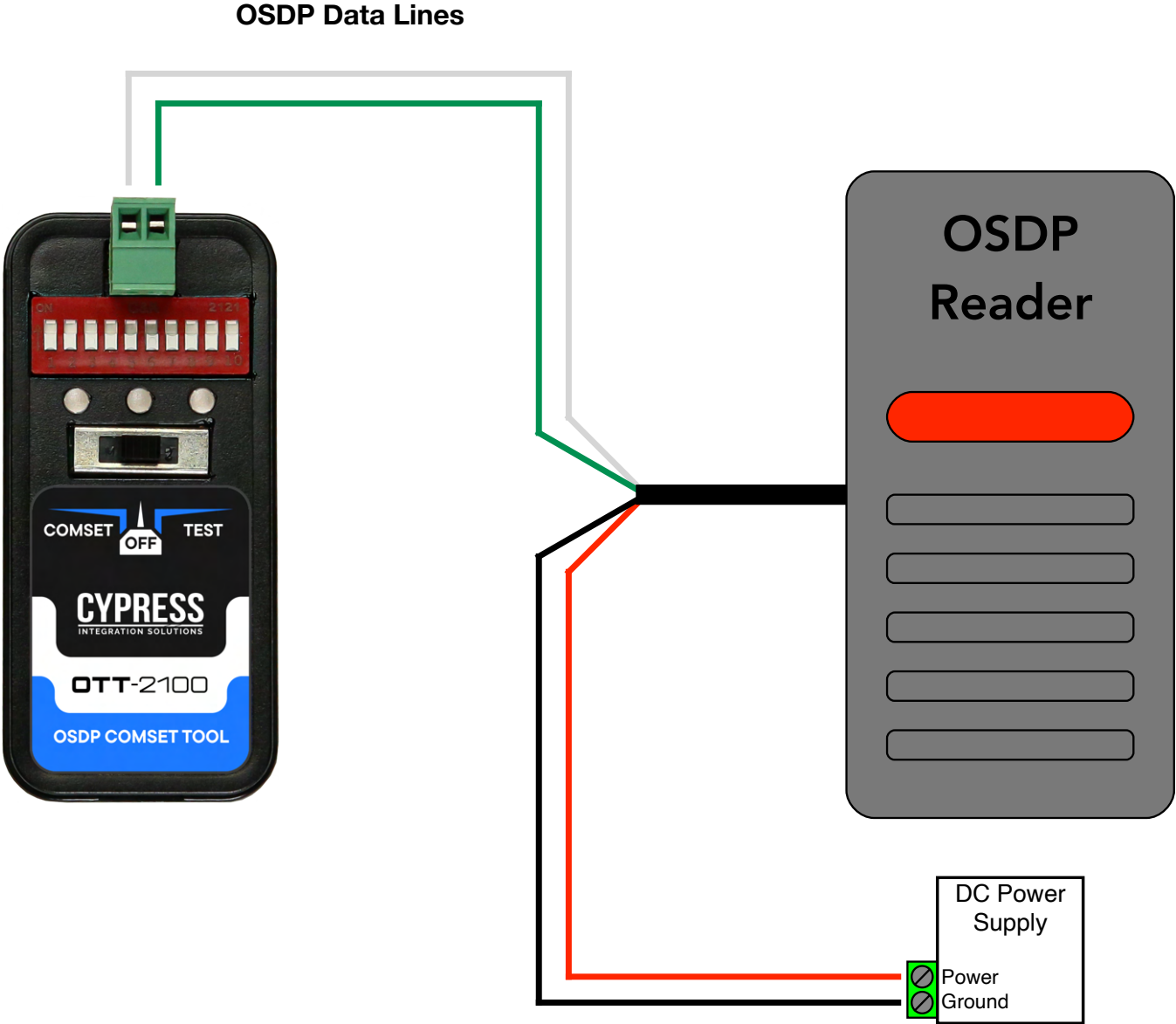
## General Instructions

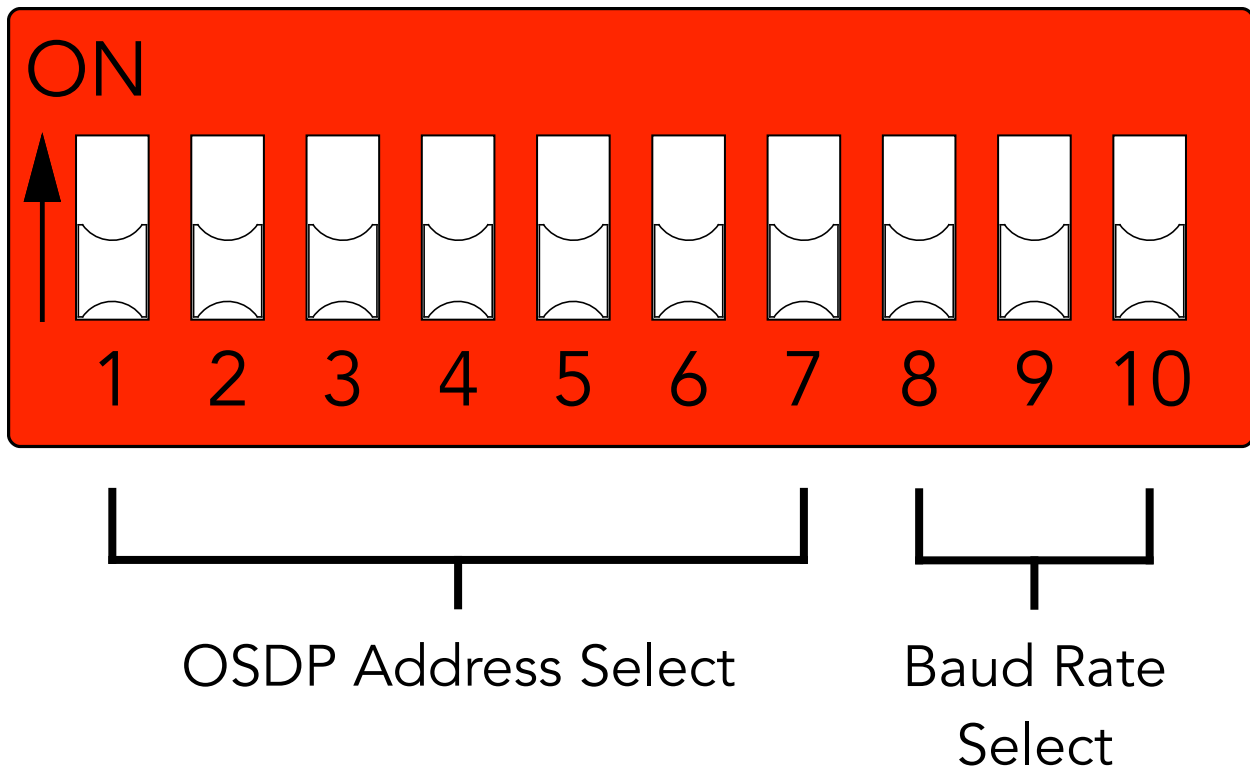
1. Set the desired address and baud rate using the DIP switches.
2. Connect the single OSDP reader or PD to the OTT-2100-2 by connecting the two OSDP data lines to the removable screw terminal block. The polarity of the OSDP data lines does not matter, as the polarity switching feature will allow communication regardless of the polarity.
3. Turn the Power/Mode switch to the left position to power the OTT-2100-2 on in COMSET Mode.
4. LED 1 will be flashing blue while the OTT-2100-2 is attempting to establish communication with the OSDP reader.
5. Once the OTT-2100-2 has established communication with the OSDP reader LED 1 will be flashing green.
6. LED 1 will continue flashing green while communicating with the OSDP reader. Once the OSDP reader address and baud rate have been configured, LED 2 will turn solid green.
7. After the address and baud rate have been configured the OTT-2100-2 will attempt to start a Secure Channel session with the OSDP reader. LED 3 will be solid green when communicating with the OSDP reader in a Secure Channel session with the default Secure Channel Base Key (SCBK).

## COMSET Mode LED Table

LED	LED State	Meaning
LED 1	Flashing Green	Communicating with the PD
	Flashing Blue	Searching for PD
	Solid Red	Low battery voltage
LED 2	Solid Green	PD's address and baud rate have been set to the selected values
	Solid Blue	PD accepted the new address, but rejected the new baud rate
	Solid Red	PD did not send COM reply after the COMSET command was sent (COMSET failed)
LED 3	Solid Green	PD has the default OSDP Secure Channel Base Key (SCBK)
	Solid Blue	PD has a custom OSDP Secure Channel Base Key (SCBK), not default
	Solid Red	PD is not capable of Secure Channel sessions (rejects any attempt)

Cypress OTT-2100-2 Manual - COMSET Mode: Wiring Diagram





The OTT-2100-2 has a 10 position DIP switch bank that is used to select the OSDP address and the baud rate that the OTT-2100-2 will configure in the connected OSDP reader or PD. The DIP switch is ON when the switch is pushed away from the number on the DIP switch bank, or toward the 2-pin header/connector. The DIP switch is OFF when the switch is pushed toward the number on the DIP switch bank, or towards the Status LEDs.

DIP switches 1-7 are used to select the desired OSDP address. Addresses 0-126 are available. See the OSDP address tables on the following pages for how set the DIP switches for the desired OSDP address.

DIP switches 8-10 are used to select the desired baud rate. See the table below on this page for how to set the DIP switches for the desired baud rate.

Baud Rate	8	9	10
9600			
19200			X
38400		X	
57600		X	X
115200	X		
230400	X		X

X = ON

# Cypress OTT-2100-2 Manual - COMSET Mode: Address DIP Switch Tables

Address	1	2	3	4	5	6	7
0							
1							X
2						X	
3						X	X
4					X		
5					X		X
6					X	X	
7					X	X	X
8				X			
9				X			X
10				X		X	
11				X		X	X
12				X	X		
13				X	X		X
14				X	X	X	
15				X	X	X	X
16			X				
17			X				X
18			X			X	
19			X			X	X
20			X		X		
21			X		X		X
22			X		X	X	
23			X		X	X	X
24			X	X			
25			X	X			X
26			X	X		X	
27			X	X		X	X

X = ON

Address	1	2	3	4	5	6	7
28			X	X	X		
29			X	X	X		X
30			X	X	X	X	
31			X	X	X	X	X
32		X					
33		X					X
34		X				X	
35		X				X	X
36		X			X		
37		X			X		X
38		X			X	X	
39		X			X	X	X
40		X		X			
41		X		X			X
42		X		X		X	
43		X		X		X	X
44		X		X	X		
45		X		X	X		X
46		X		X	X	X	
47		X		X	X	X	X
48		X	X				
49		X	X				X
50		X	X			X	
51		X	X			X	X
52		X	X		X		
53		X	X		X		X
54		X	X		X	X	
55		X	X		X	X	X

X = ON



# Cypress OTT-2100-2 Manual - COMSET Mode: Address DIP Switch Tables (cont.)

Address	1	2	3	4	5	6	7
56		X	X	X			
57		X	X	X			X
58		X	X	X		X	
59		X	X	X		X	X
60		X	X	X	X		
61		X	X	X	X		X
62		X	X	X	X	X	
63		X	X	X	X	X	X
64	X						
65	X						X
66	X					X	
67	X					X	X
68	X				X		
69	X				X		X
70	X				X	X	
71	X				X	X	X
72	X			X			
73	X			X			X
74	X			X		X	
75	X			X		X	X
76	X			X	X		
77	X			X	X		X
78	X			X	X	X	
79	X			X	X	X	X
80	X		X				
81	X		X				X
82	X		X			X	
83	X		X			X	X

X = ON

Address	1	2	3	4	5	6	7
84	X		X		X		
85	X		X		X		X
86	X		X		X	X	
87	X		X		X	X	X
88	X		X	X			
89	X		X	X			X
90	X		X	X		X	
91	X		X	X		X	X
92	X		X	X	X		
93	X		X	X	X		X
94	X		X	X	X	X	
95	X		X	X	X	X	X
96	X	X					
97	X	X					X
98	X	X				X	
99	X	X				X	X
100	X	X			X		
101	X	X			X		X
102	X	X			X	X	
103	X	X			X	X	X
104	X	X		X			
105	X	X		X			X
106	X	X		X		X	
107	X	X		X		X	X
108	X	X		X	X		
109	X	X		X	X		X
110	X	X		X	X	X	
111	X	X		X	X	X	X

X = ON

## Cypress OTT-2100-2 Manual - COMSET Mode: Address DIP Switch Tables (cont.)

Address	1	2	3	4	5	6	7
112	X	X	X				
113	X	X	X				X
114	X	X	X			X	
115	X	X	X			X	X
116	X	X	X		X		
117	X	X	X		X		X
118	X	X	X		X	X	
119	X	X	X		X	X	X
120	X	X	X	X			
121	X	X	X	X			X
122	X	X	X	X		X	
123	X	X	X	X		X	X
124	X	X	X	X	X		
125	X	X	X	X	X		X
126	X	X	X	X	X	X	

X = ON

# Cypress OTT-2100-2 Manual - Cypress SCBK Reset Mode

## Overview

The OTT-2100-2 is put into Cypress SCBK (Secure Channel Base Key) Reset Mode by turning on DIP switches 8, 9, and 10 ON, while DIP switches 1-7 are OFF, and pushing the Power/Mode Switch to the left or right position.

The Cypress SCBK Reset Mode is used to reset the SCBK of supported Cypress products to the default value. The default value can either be the SCBK-D defined in the OSDP spec, or a default SCBK defined by Cypress. The OTT-2100-2 will attempt to reset the SCBK using Cypress manufacturer specific commands. The Cypress device must be set to PD mode during this process.

OSDP Spec SCBK-D (in HEX): 30 31 32 33 34 35 36 37 38 39 3A 3B 3C 3D 3E 3F

## General Instructions

1. Set DIP switches 1-7 OFF, and 8, 9, and 10 ON.
2. Connect OTT-2100-2 to the Cypress product via the OSDP connection.
3. Turn the Power/Mode switch to either the left or right position to power the OTT-2100-2 on in Cypress SCBK Reset Mode.
4. LED 1 will be flashing blue while it searches for an OSDP PD (Cypress Product) on the OSDP bus.
5. When the OTT-2100-2 established communication with the OSDP PD, LED 1 will be flashing green and begin attempting the reset SCBK using Cypress manufacturer specific commands.
6. LED 1, LED 2, and LED 3 will be solid red when the OTT-2100-2 fails to reset the SCBK.
7. LED 1, LED 2, and LED 3, will be solid green when the OTT-2100-2 successfully resets the SCBK.

## SCBK Reset Mode LED Table

LED	LED State	Meaning
LED 1	Flashing Green	OTT-2100-2 is communicating OSDP PD and attempting to reset the SCBK
	Flashing Blue	OTT-2100-2 is searching for an OSDP PD on the OSDP bus
	Solid Red	Low battery voltage
LED 1, 2, & 3	Solid Green	SCBK success fully reset
	Solid Red	Failed to reset SCBK

## Cypress OTT-2100-2 Manual - OSDP Terminology

This section lists and defines in general terms OSDP terminology used in this manual.

**Access Control Unit (ACU):** Typically the access controller, the ACU is the device on the OSDP bus that controls the PDs. The ACU only sends commands to the PDs and waits for replies.

**Peripheral Device (PD):** Typically a reader, but many other devices can be PDs, any device on the OSDP bus that is not the ACU. PDs receive commands from the ACU and send replies.

**Address:** OSDP Peripheral Devices are assigned an address, all PDs on the OSDP bus must have a unique address. This address is used in commands from the ACU and in replies from the PD to indicate which device the message is being sent to/from.

**Baud Rate:** Data transfer rate, expressed in bits per second.

**Secure Channel Base Key (SCBK):** 16 byte key set by the user used to initiate Secure Channel communication sessions.

**Secure Channel Base Key Default (SCBK-D):** Default SCBK value. Default value set by the manufacturer or the default value defined in the OSDP specification.

**Secure Channel (SC) Session:** OSDP communication sessions using the Secure Channel Protocol, which, among other things, encrypts the data payload in OSDP messages.