

IMPORTANT SAFEGUARDS
READ AND FOLLOW ALL SAFETY INSTRUCTIONS
SAVE THESE INSTRUCTIONS

When using electrical equipment, basic safety precautions should always be followed including the following:

- Do not use outdoors.
- Do not mount near gas or electric heaters.
- Equipment should be mounted in locations and at heights where it will not be subjected to tampering by unauthorized personnel.
- The use of accessory equipment not recommended by the manufacturer may cause an unsafe condition.
- Do not use this equipment for other than its intended use.

Distributed Room Controller (DRC) Smart Pack

Cat. No. DRD07

WARNINGS AND CAUTIONS

- **TO AVOID FIRE, SHOCK, OR DEATH; TURN OFF POWER AT CIRCUIT BREAKER OR FUSE AND TEST THAT POWER IS OFF BEFORE WIRING, SERVICING, OR REMOVING FIXTURE OR CHANGING LAMPS!**
- **WARNING:** This equipment permits more than one power supply output source. **To avoid electric shock disconnect both normal and emergency sources connected to this unit before servicing any equipment connected to this unit.**
- "EMERGENCY CIRCUITS" enclosed label should be placed in a highly visible location if any DRC is part of the emergency system so as to be readily identifiable as a component of the emergency system.

WARNINGS AND CAUTIONS

- To be installed and/or used in accordance with electrical codes and regulations.
- If you are not sure about any part of these instructions, consult an electrician.
- To avoid electrical overload, total connected lamp load shall not exceed output rating.
- Test all LumaCAN cables for proper pin-out configuration prior to interconnecting devices and systems.
- To be used for indoor applications only.
- Use this device with **copper or copper clad wire only**.

PK-A3148-10-00-2A

INSTALLATION AND QUICK START GUIDE

ENGLISH

DESCRIPTION

The Distributed Room Controller Smart Pack contains a power supply, 0-10V Dimming Control, LumaCAN RJ45 input/output and a load switching latching relay. The power supply provides Class 2 low-voltage power over LumaCAN for powering other devices (Distributed Switch, Occupancy Sensor, Photocell, Sapphire Touch Controller) as well as monitoring the status of power. The DRC Smart Pack requires connection to a LumaCAN network for control, no local control is provided. The power pack includes zero cross switching circuitry to minimize inrush current associated with incandescent lights, LED and electronic ballasts, increasing its life expectancy.

Application Notes:

1. When the total lighting fixtures load exceeds a single power pack's rating (e.g. 16A Electronic Ballasts), the load will need to be separated using multiple DRC Smart Packs.
2. When more devices are required than one power pack can supply on the +24V LumaCAN bus, multiple power packs can be used to supply power to support the additional devices (up to a maximum of 600mA between two power packs via LumaCAN RJ45 24V output).
Total number of devices attached to a single DRC Smart Pack must be <= 300mA.

Device current requirement (typical):

Sapphire Touch Controller = 600mA (2 DRC's Required)

Digital Switch = 25mA

Photocell = 15mA

Occupancy Sensor = 40mA

SPECIFICATIONS	
Part Number	DRD07-ED0
Input Voltage*	120-277VAC, 50/60Hz Standby Power: 0.62W @ 120V, 1.08W @ 277V Max Power: 9.30W @ 120V, 9.78W @ 277V
Load Ratings (120-277VAC)	20A Tungsten 20A General Purpose Plug Load 20A Standard Ballast 16A Electronic Ballast, LED
Motor Ratings	1/2Hp (9.8 FLA) @ 120VAC 2 Hp (12 FLA) @ 240-277VAC
0-10V Control	0.8 - 10+VDC, 100mA Sinking
LumaCAN Power Output	+24VDC, 300mA (will not pass power through, diodes installed on each of the two RJ45's. Supply only.)
LumaCAN Data	LumaCAN 3 Only Daisy-Chain Topology 1600 feet max per segment Repeaters can be used for networks up to 10,000 feet and to support home-run topology Max 110 nodes per segment Max 250 nodes
Connections	18 AWG (Power, 0-10V) 12 AWG (Load IN/OUT) RJ45, CAT6A or better (LumaCAN)
LED Indicator	Yes
Dimensions	4.84" x 4.52" x 1.81"
Weight	0.6 lb (9 oz)
Mounting	Standard 4S junction box with minimum volume of 30.3 cu. inches or greater (4" x 4"x 2.125") using the two (2) provided 8-32 x 2.5" screws. Or, mounted to junction box via 1/2" nipple.
LumaCAN Connections	CAT6A (or better) cable
Operational Temperature	32° to 122° F (0° to 50° C)
Agency Standards and Certifications	UL E#: E148771 cULus LISTED UL916 / CSA C22.22 No. 205, Energy Mgmt. Eq. cULus LISTED UL924 / CSA C22.2 No. 141-10 Emergency Lght. cULus LISTED UL2043 Plenum Rating FCC Part 15, Class A IEC 61000 4-2, 2nd Ed., 12kV Air (ESD) IEC 61000 4-5, 3rd Ed., 2/4kV (Line Surge)
IP Rating	IP30

* Input voltage tolerance 10%, Frequency tolerance 5%.

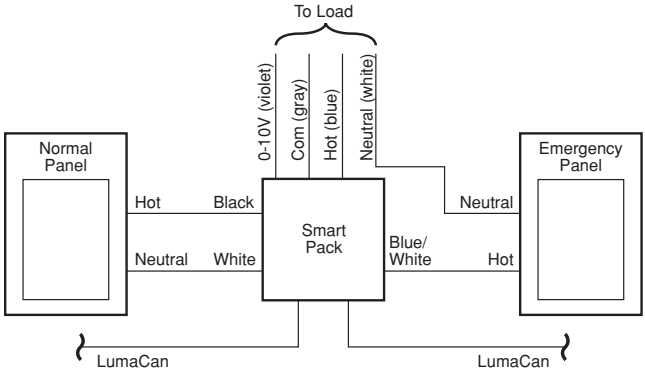
EMERGENCY

The DRC Smart Pack can be used as a UL 924 emergency bypass device ensuring that the relay is closed during a power failure condition. Availability of input power to power the load is the responsibility of others. Two options for sensing normal power are available and your Construction Documents will dictate which you are to use. The options and features of normal sense are as follows:

- **Sense is Normal Power through the Black (Line) wire:** Upon loss of supplying power to the device, relay will close.
- **Sense is power over LumaCAN:** Upon loss of +24V power on LumaCAN wire, relay will close.

The "Emergency Circuits" label shall be placed on the Smart Pack so the user is aware this device is used for emergency lighting.

Sense is Normal Power through the supply Input (Black/White): In this scenario, the supply input wires are connected to normal power, and, the Load In for the relay is connected to Emergency Power. Upon loss of normal power, the relay closes, and the 0-10V lines go to high impedance allowing the load to go to full output powered from the Emergency Source. The Emergency Mode switch must be in the LINE position. Upon restoration of normal power, Smart Pack will automatically resume normal operation.



Sense is power over LumaCAN: In this scenario, both the supply input wires AND the Load-In are connected to the emergency source. The SmartPack monitors power on the LumaCAN line and upon loss of power, the relay closes and 0-10V lines go to full output. There are two advantages of this mode: 1. LumaCAN remains operational during the emergency event and can report it's status to the network, and, 2. Only EM power is run to the DRC Smart Pack so separation of normal and emergency at this location is not required.

Notes Specific to this mode:

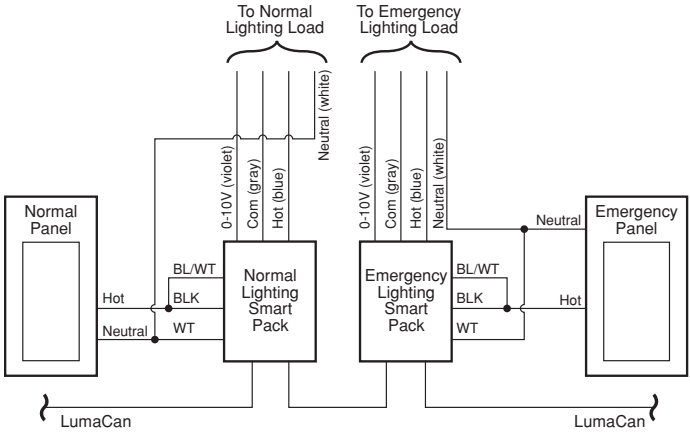
- The Emergency Mode switch must be in the CAN position.

The CAN Switch

CAN MODE
(switch in UP position)

LINE MODE
(switch in DOWN position)

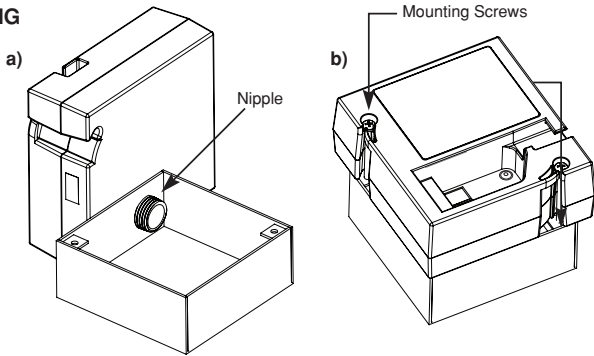
- **CAN MODE**
 - Device does NOT supply voltage or power to +24VDC LumaCAN bus
 - On loss of +24VDC LumaCAN bus power device will close RELAY and force 0-10V to MAX brightness
- **LINE MODE**
 - Device supplies 24VDC power to LumaCAN bus to power other devices
 - On loss of LINE power the device will close RELAY and force 0-10V to high impedance (Max brightness)
- The Smart Pack will not provide power to the LumaCAN network. All power must be from other devices.
- The Systems Designer and Installer must verify that any and all power supplies which could supply power to either LumaCAN segment are fed from normal power and are not connected to a UPS or other power source which could be powered in an EM condition.
- SmartPack will go to full output within 1 second.
- Upon restoration of Normal Power, the Smart Pack will automatically resume normal operation.



INSTALLATION

1. **WARNING: TO AVOID FIRE, SHOCK, OR DEATH; TURN OFF POWER AT CIRCUIT BREAKER OR FUSE AND TEST THAT POWER IS OFF BEFORE WIRING!**
NOTE: This is an ESD Sensitive Device. Use safe ESD handling procedures when installing.
2. Mount the DRC Smart pack per desired application (**see Mounting figure**):
 - a. Mount to junction box using nipple and mounting nut provided.
 - b. Mount to face of 4S junction box with minimum volume 30.3 cu. inches or greater (4" x 4"x 2.125") using the two (2) provided 8-32 x 2.5" screws.
 - Ensure that conduit/cable entry clamp is located in a corner of junction box opposite the DRC nipple as conflicts may occur.
 - Dress wires to provide enough clearance when device is installed.
3. **CLASS 2 INSTALLATION NOTE:** #3 0-10V Control Wiring - Connect the Violet wire to the + 0-10V line and the Gray wire to the 0-10V common using Class 1 or Class 2 wiring methods as indicated in these instructions, ballast/fixture/driver instructions or ballast/fixture/driver label markings which are in accordance with NEC Code NFPA 70, paragraph 725.136 (d).
 - a. **For Installation as a Class 1 Device:** When this product is installed as a Class 1 device and configured for use with other Class 1 devices it shall be wired using typical NEC Class 1 requirements.
 - b. **For Installation as a Class 2 Device:** All devices in the circuit must be Class 2 rated and wired per instructions below. The 0-10V control wires must be mechanically separated from Class 1, line, neutral and ground power lines. This can be accomplished by install a mechanical barrier, in the form of silicone tubing (enclosed) or other non-conducting sleeve, over the length of building wires, or **CL3, CL3R or CL3P** rated control cables, entering the junction box and terminate the tubing at the wire nut that connects the building wire to the Violet & Gray 0-10V control wires from device. The silicone tubing shall be NRTL (UL/CSA/ETL) recognized or equivalent to provide mechanical separation equal to .25" in air. The Connectors joining 0-10V control wires shall be approved NRTL LISTED connectors. Wire connectors shall be provided by the installation contractor.

MOUNTING



4. **Line Voltage Wiring:** Remove 5/8" (1.6 cm) of insulation from each circuit conductor. Make sure that ends of conductors are straight. Connect lead wires from DRC Smart Pack to LINE circuit per appropriate WIRING DIAGRAM as follows: Twist strands of each lead tightly and, with circuit conductors push firmly into appropriate wire connector. Screw connectors on clockwise making sure that no bare conductor shows below the wire connectors. Secure each connector with electrical tape.
5. **LumaCAN:** Two LumaCAN ports are provided to maintain the required Daisy-Chain topology of the LumaCAN network. Plug in CAT6A (or better) cable with standard RJ45 connector. If two connections are required, remove the terminator from one of the RJ45's and make both connections. If only one connection is required, leave the supplied terminator connected.
 - Wire per the TIA-568B standard.
 - The sequence of network nodes, as described in the Construction Documents, may be critical to ensure power distribution between nodes.
 - All LumaCAN wire segments must be tested and validated prior to power-up of the system.
 - The last device in each LumaCAN run must be terminated using an RJ45 terminator plug. Each Smart Pack is supplied with one terminator plug pre-installed in the smart pack. Additional terminators are available upon request. LumaCAN connections must be wired as Class 2 and as such should be installed according to the requirements of your authorities having jurisdiction. If it is required that the Class 2 wiring be in conduit, use a 4S extension ring and blank plate on the LumaCAN side of the Smart Pack, and, terminate conduit to the extension ring.

Restore power at circuit breaker or fuse. **INSTALLATION IS COMPLETE.** When power is applied, Smart Pack will power up in the ON state and then default to the last powered down state. The default from the factory is ON after power up.

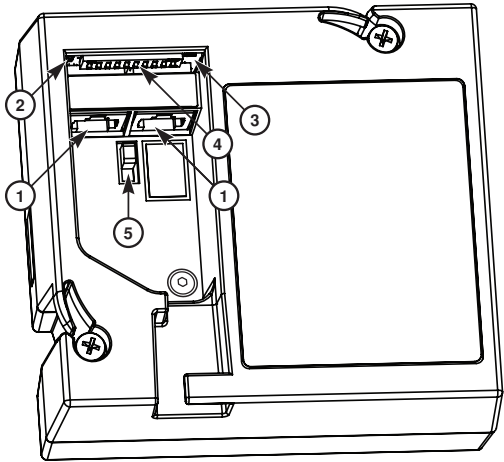
Wire Designations

Control Power In: 120-277VAC	Black	18 AWG
Control Neutral	White	18 AWG
Load (Load IN)	Blue/White	12 AWG
Load (Load OUT)	Blue	12 AWG
0-10VDC Control	Violet	18 AWG
0-10VDC Common	Gray	18 AWG

- All wires rated at 105C, 600V insulation.

1. LINE - **Black** is tied to 120-277VAC Line power (Black incoming line)
2. Neutral - **White** is tied to incoming Neutral
3. LOAD IN - **Blue/White** is the input/incoming Load line is tied to incoming "LINE" power. This could be same wire as #1 or it could be a separate "LINE" power. Perhaps coming from Emergency circuit supply. Can be 120-277VAC.
4. LOAD OUT - **Blue** wire. This goes to the device to be powered.
5. The **Violet** gets connected to the + side of the fixture's 0-10V dimming input and **Gray** gets connected to the – side of the fixture's 0-10V dimming input.

OPERATION



1. **LumaCAN Port**
2. **LumaCAN LED** - left side of DIP switch
3. **Heartbeat/Configuration LED** - right side of DIP switch
4. **DIP Switches** - In middle
5. **Emergency Sense Selector Switch** - At bottom of tub. (LINE MODE = AWAY from RJ45 CONNECTORS, CAN MODE = CLOSE to RJ45 CONNECTORS)

LED INDICATORS

The LumaCAN LED: Flashes Green whenever there is LumaCAN traffic detected.

Heartbeat LED: See chart below:

Indicator	Feature	Blink Rate (# blinks per second)	Duration	Possible Causes
Red	Duplicate LumaCAN address	2	Until conflict is resolved	Another LumaCAN device is using the same address
	UI Error didn't get value set in time	8	Until 60 seconds or UI setting restarted	Took too long to enter manual information
	External watchdog fail safe circuit tripped.	Solid	Until watchdog circuit is no longer tripped	Application update failure, hardware failure
White	LumaCAN address on switch matches current address	8	Until set or timed out after 10 seconds	
	Setting LumaCAN address and verifying address uniqueness	Solid	Until timed out after 10 seconds	
	Device didn't start, I/O not initialized	Solid	Until problem resolved	Hardware failure
Blue	Low byte of LumaCAN channel number is locked in	8		
	Waiting for low byte to be locked in	Solid	Until set or timed out after 60 seconds	
Green	Normal operating condition	1		
	In boot loader	4	Until entering actual application	Application update failure if alternating with RED LED.
	High byte of LumaCAN channel number is locked in	8	Single blink	
	Waiting for high byte to be locked in	Solid	Until set or timed out after 60 seconds	
Off	LumaCAN Overcurrent or failure	–	–	

Heartbeat LED status in various "failure" states are as follows:

- **Processor fails or failed application - RED**
 - **Resolution:** Cycle Power. If a power cycle does not restore proper operation, remove LumaCAN connections and cycle power again. Do not reconnect LumaCAN until after normal operation is restored.
- **Processor in Reset or startup failure - WHITE**
 - **Resolution:** Cycle Power. If a power cycle does not restore proper operation, remove LumaCAN connections and cycle power again. Do not reconnect LumaCAN until after normal operation is restored.
- **Off - Failure**
 - **Resolution:** Remove LumaCAN wires. If devices starts up, then there is either an Overcurrent or Short on the LumaCAN line. Resolve the problem and reconnect.
 - **Resolution:** Check Control Power Input. If Control Power Input is not valid, the device will not start. Set CAN address to 255 and cycle power to erase application, then reprogram.

SETTING THE LUMACAN ADDRESS

A unique LumaCAN address ID must be set for each DRC SmartPack. The first 8 switches of the DIP switch are used for setting the ID. During operation, DIP switches 9 & 10 must be in the off position. Valid node addresses are 1-250. If the node ID's are defined in your Contract Document, set to that address. If not, ensure that the ID is unique for each device in the system. It's helpful, although not required, that the location of each node ID is documented for use by Leviton Field service during system commissioning. To set the node ID, set the DIP switches to the desired ID following the process below:

NOTE: In all cases, DIP switches 9 & 10 should be in the off position.

ID Address Value = Sum of Switch Values
ID 86 = 2+4+16+64

128
64
32
16
8
4
2

128
64
32
16
8
4
2

128
64
32
16
8
4
2

128
64
32
16
8
4
2

128
64
32
16
8
4
2

128
64
32
16
8
4
2

128
64
32
16
8
4
2

128
64
32
16
8
4
2

Switch Values

In case of address conflict, the heartbeat LED will blink Red, twice per second. If this occurs, please clear the conflict and try again.

SETTING THE STARTING LUMACAN CHANNEL (via DIP Switch)

Setting the channel number requires setting the universe number and the channel number within that universe. Valid universe numbers are 0-127, resulting in a channel range of 1-32,767. The chart shows each universe number, the channel range for that universe, the DIP switch setting for the universe, and the actual channel number.

To set the channel number:

1. Set the Universe Number

a. Turn on DIP Switch P2/10.

i. The LED Indicator should change to solid green indicating that the Smart Pack is awaiting entry of the universe number.

b. Set DIP switches 1-8 to the required address of the universe number. Refer to the chart. For channel numbers between 1-256 it will be set to all 0's.

c. When the address is set, lower DIP switch P2/10.

i. The LED Indicator will start flashing Blue indicating that it is awaiting the channel number.

2. Set the Channel Number

a. Raise DIP Switch P1/9.

i. The LED indicator should go solid blue.

b. Set DIP switches 1-8 to the required address of the channel number. Refer to the chart.

c. Lower dip-switch P1/9.

3. Return DIP switches 1-8 to the desired LumaCAN address.

a. While the addressing is being set, the LED indicator will go solid White. When address is set and operation restored, the LED will blink green once per second.

NOTES:

If the LED is flashing blue, it means it's awaiting the channel number. If the LED indicator is flashing green it indicates it is awaiting the universe number. They can be set in either order but both must be set every time.

TROUBLESHOOTING

Lights are ON after power outage

- This is the normal operation. The power pack has a fail-safe feature which forces the relay to close on loss of power. Approximately 7-10 seconds after power is restored the device will return to previous state and continue to monitor LumaCAN bus for any changes.

Device does not operate immediately after power ON

- This is the normal operation. The device has a 7-10 second startup time before it will begin operation.

Lights Flickering

- Lamp has a bad connection.
- Wires not secured firmly with wire connectors.

Lights did not turn ON

- Circuit breaker or fuse has tripped.
- Lamp is burned out.
- Lamp Neutral connection is not wired.

Heartbeat LED is either RED or WHITE

- Represents a processor or application failure. Try power cycling the DRC Smart Pack.

APPLICATION RESET

If your device is "bricked", powering up the device with all dip switches in the on position will cause the current application to be deleted. Note that this will leave the device in an inoperable state until a software update is performed.

FACTORY DEFAULT

If you desire to return all settings to their factory default position, while the device is powered up, raise dip switches 1-8 to the ON position (P1 and P2 should remain in their OFF position). The LED will blink yellow indicating that factory defaults have been restored. Proceed to set the channel number and LumaCAN address.

Universe #	Channel Range	Actual Channel Range		Universe Dip Switch Setting	Channel Dip Switching Setting									
		Start	End		00000000	00000001	00000010	00000011	00000100	...	11111101	11111110	11111111	
					Actual Channel Number									
0	1-255	1	255	00000000	1	1	2	3	4	...	253	254	255	
1	256-511	256	511	00000001	256	257	258	259	260	...	509	510	511	
2	512-767	512	767	00000010	512	513	514	515	516	...	765	766	767	
3	768-1023	768	1023	00000011	768	769	770	771	772	...	1021	1022	1023	
4	1024-1279	1024	1279	00000100	1024	1025	1026	1027	1028	...	1277	1278	1279	
5	1280-1535	1280	1535	00000101	1280	1281	1282	1283	1284	...	1533	1534	1535	
6	1536-1791	1536	1791	00000110	1536	1537	1538	1539	1540	...	1789	1790	1791	
7	1792-2047	1792	2047	00000111	1792	1793	1794	1795	1796	...	2045	2046	2047	
8	2048-2303	2048	2303	00001000	2048	2049	2050	2051	2052	...	2301	2302	2303	
9	2304-2559	2304	2559	00001001	2304	2305	2306	2307	2308	...	2557	2558	2559	
10	2560-2815	2560	2815	00001010	2560	2561	2562	2563	2564	...	2813	2814	2815	
11	2816-3071	2816	3071	00001011	2816	2817	2818	2819	2820	...	3069	3070	3071	
12	3072-3327	3072	3327	00001100	3072	3073	3074	3075	3076	...	3325	3326	3327	
13	3328-3583	3328	3583	00001101	3328	3329	3330	3331	3332	...	3581	3582	3583	
14	3584-3839	3584	3839	00001110	3584	3585	3586	3587	3588	...	3837	3838	3839	
15	3840-4095	3840	4095	00001111	3840	3841	3842	3843	3844	...	4093	4094	4095	
16	4096-4351	4096	4351	00010000	4096	4097	4098	4099	4100	...	4349	4350	4351	
17	4352-4607	4352	4607	00010001	4352	4353	4354	4355	4356	...	4605	4606	4607	
18	4608-4863	4608	4863	00010010	4608	4609	4610	4611	4612	...	4861	4862	4863	
19	4864-5119	4864	5119	00010011	4864	4865	4866	4867	4868	...	5117	5118	5119	
20	5120-5375	5120	5375	00010100	5120	5121	5122	5123	5124	...	5373	5374	5375	
21	5376-5631	5376	5631	00010101	5376	5377	5378	5379	5380	...	5629	5630	5631	
22	5632-5887	5632	5887	00010110	5632	5633	5634	5635	5636	...	5885	5886	5887	
23	5888-6143	5888	6143	00010111	5888	5889	5890	5891	5892	...	6141	6142	6143	
24	6144-6399	6144	6399	00011000	6144	6145	6146	6147	6148	...	6397	6398	6399	
25	6400-6655	6400	6655	00011001	6400	6401	6402	6403	6404	...	6653	6654	6655	
26	6656-6911	6656	6911	00011010	6656	6657	6658	6659	6660	...	6909	6910	6911	
27	6912-7167	6912	7167	00011011	6912	6913	6914	6915	6916	...	7165	7166	7167	
28	7168-7423	7168	7423	00011100	7168	7169	7170	7171	7172	...	7421	7422	7423	
29	7424-7679	7424	7679	00011101	7424	7425	7426	7427	7428	...	7677	7678	7679	
30	7680-7935	7680	7935	00011110	7680	7681	7682	7683	7684	...	7933	7934	7935	
31	7936-8191	7936	8191	00011111	7936	7937	7938	7939	7940	...	8189	8190	8191	
32	8192-8447	8192	8447	00100000	8192	8193	8194	8195	8196	...	8445	8446	8447	
33	8448-8703	8448	8703	00100001	8448	8449	8450	8451	8452	...	8701	8702	8703	
34	8704-8959	8704	8959	00100010	8704	8705	8706	8707	8708	...	8957	8958	8959	
35	8960-9215	8960	9215	00100011	8960	8961	8962	8963	8964	...	9213	9214	9215	
36	9216-9471	9216	9471	00100100	9216	9217	9218	9219	9220	...	9469	9470	9471	
37	9472-9727	9472	9727	00100101	9472	9473	9474	9475	9476	...	9725	9726	9727	
38	9728-9983	9728	9983	00100110	9728	9729	9730	9731	9732	...	9981	9982	9983	
39	9984-10239	9984	10239	00100111	9984	9985	9986	9987	9988	...	10237	10238	10239	
40	10240-10495	10240	10495	00101000	10240	10241	10242	10243	10244	...	10493	10494	10495	
41	10496-10751	10496	10751	00101001	10496	10497	10498	10499	10500	...	10749	10750	10751	
42	10752-11007	10752	11007	00101010	10752	10753	10754	10755	10756	...	11005	11006	11007	
43	11008-11263	11008	11263	00101011	11008	11009	11010	11011	11012	...	11261	11262	11263	
44	11264-11519	11264	11519	00101100	11264	11265	11266	11267	11268	...	11517	11518	11519	
45	11520-11775	11520	11775	00101101	11520	11521	11522	11523	11524	...	11773	11774	11775	
46	11776-12031	11776	12031	00101110	11776	11777	11778	11779	11780	...	12029	12030	12031	
47	12032-12287	12032	12287	00101111	12032	12033	12034	12035	12036	...	12285	12286	12287	
48	12288-12543	12288	12543	00110000	12288	12289	12290	12291	12292	...	12541	12542	12543	
49	12544-12799	12544	12799	00110001	12544	12545	12546	12547	12548	...	12797	12798	12799	
50	12800-13055	12800	13055	00110010	12800	12801	12802	12803	12804	...	13053	13054	13055	
51	13056-13311	13056	13311	00110011	13056	13057	13058	13059	13060	...	13309	13310	13311	
52	13312-13567	13312	13567	00110100	13312	13313	13314	13315	13316	...	13565	13566	13567	
53	13568-13823	13568	13823	00110101	13568	13569	13570	13571	13572	...	13821	13822	13823	
54	13824-14079	13824	14079	00110110	13824	13825	13826	13827	13828	...	14077	14078	14079	
55	14080-14335	14080	14335	00110111	14080	14081	14082	14083	14084	...	14333	14334	14335	
56	14336-14591	14336	14591	00111000	14336	14337	14338	14339	14340	...	14589	14590	14591	
57	14592-14847	14592	14847	00111001	14592	14593	14594	14595	14596	...	14845	14846	14847	
58	14848-15103	14848	15103	00111010	14848	14849	14850	14851	14852	...	15101	15102	15103	
59	15104-15359	15104	15359	00111011	15104	15105	15106	15107	15108	...	15357	15358	15359	
60	15360-15615	15360	15615	00111100	15360	15361	15362	15363	15364	...	15613	15614	15615	
61	15616-15871	15616	15871	00111101	15616	15617	15618	15619	15620	...	15869	15870	15871	
62	15872-16127	15872	16127	00111110	15872	15873	15874	15875	15876	...	16125	16126	16127	
63	16128-16383	16128	16383	00111111	16128	16129	16130	16131	16132	...	16381	16382	16383	
64	16384-16639	16384	16639	01000000	16384	16385	16386	16387	16388	...	16637	16638	16639	
65	16640-16895	16640	16895	01000001	16640	16641	16642	16643	16644	...	16893	16894	16895	
66	16896-17151	16896	17151	01000010	16896	16897	16898	16899	16900	...	17149	17150	17151	
67	17152-17407	17152	17407	01000011	17152	17153	17154	17155	17156	...	17405	17406	17407	
68	17408-17663	17408	17663	01000100	17408	17409	17410	17411	17412	...	17661	17662	17663	
69	17664-17919	17664	17919	01000101	17664	17665	17666	17667	17668	...	17917	17918	17919	
70	17920-18175	17920	18175	01000110	17920	17921	17922	17923	17924	...	18173	18174	18175	
71	18176-18431	18176												