



Connected AirWits PM User Manual

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Connected AirWits PM is a connected particulate matter, temperature, and humidity metering device for real and accurate air quality monitoring.

AirWits PM
R2.1

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Using this manual

Thank you for choosing this Connected Inventions device. This device will provide you high-quality IoT with Connected Inventions' exceptional technology and high standards. This manual has been specially designed to guide you through the functions and features of your device.

Read me first

- Before using your device, read the entire manual and all safety instructions to ensure safe and proper use.
- The descriptions in this manual are based on the default settings of your device.
- The images used in this manual may differ from the actual product.
- The contents of this manual may differ from software provided by service providers or carriers, and are subject to change without prior notice.
- Access the Connected Inventions website (www.connectedinventions.com) for the latest version of the manual.
- Available features and additional services may vary by service provider.

- Applications on this device may perform differently from comparable applications and may not include all functions available (by ie. downlink messaging features)
- Connected Inventions is not liable for performance issues caused by third-party applications or improper installation.
- Please keep this manual for future reference.

Malfunction

- In case of malfunction, deliver the device to the supplier. Do not open the cover.

Transportation

- Do not remove packing material and do not repack the device unless necessary. Contact the shipping agent before transportation. Inside the device there is a battery which contains approximately 5.0 g of lithium.

Disposal

- Return the device to a disposal station which collects electronics waste and batteries.

Operation

- Protect the device from moisture, water, and dirt.

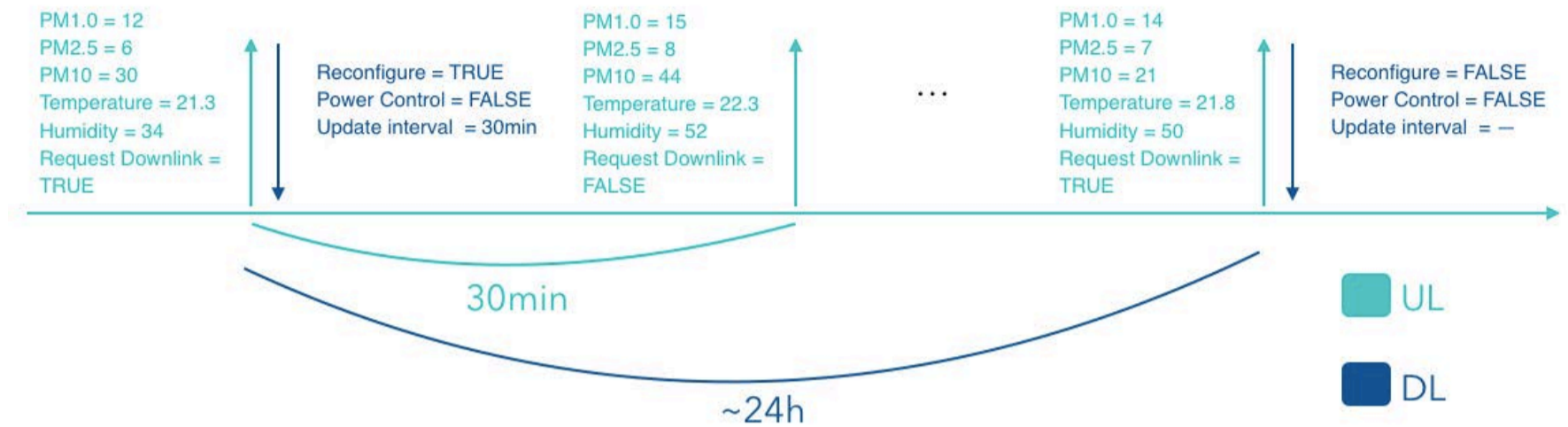
About

Connected Inventions AirWits PM is a wireless air quality metering device with ultra long battery life. This intelligent and small device measures and sends the particular matter mass concentrations PM1.0, PM 2.5 and PM10 as ug/m3 plus temperature and humidity data sequentially from 10 min to 24 hours using the world-wide Sigfox IoT-network connectivity for data transmission, enabling very low lifetime cost. The installation of the device is extremely simple procedure and requires neither special tools nor configuration operation. The device is maintenance free, and thus a great solution especially for long term indoor air quality metering providing accurate data for energy savings and comfortable living conditions which can be monitored remotely.



Function

The basic functionality procedure example:



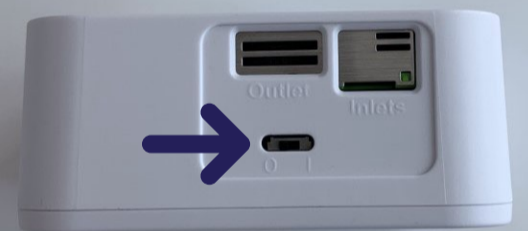
When the device is powered on, it will send the measurements and ask downlink message from the network. If the downlink message is configured and reconfigure bit is 1, new settings will be adopted. In case downlink message is not configured, the reconfigure bit is 0 or the downlink message cannot be read, the previous settings will remain. The transmission interval time and adaptive power control function can be set through downlink message. After the downlink request, the device sends only uplink messages for the next 24 hours. After every 24 hours, the device will send downlink request again within next payload transmission.

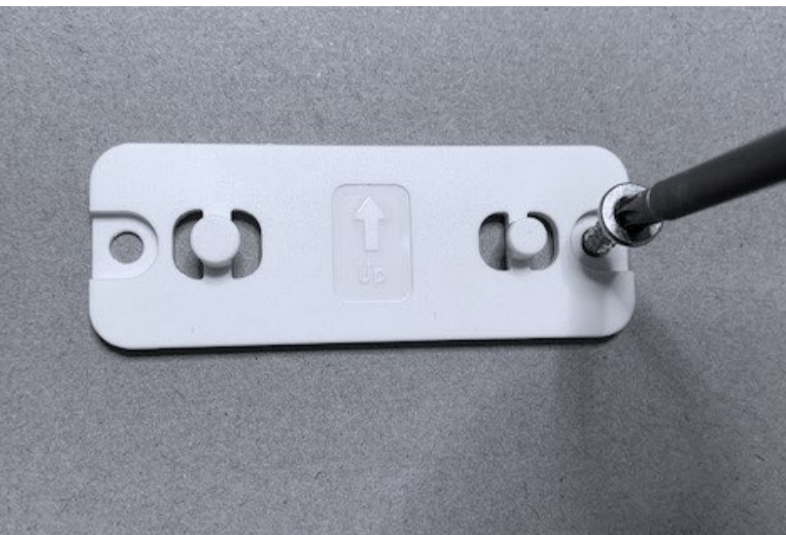
Assembly & Installation



- 1 Save the identifier and the key of the device. The identifier and the PAC key are on the label on the bottom of the device. You can also read the identifier and the PAC key using the QR code.

- 2 Switch the device on by sliding the power switch to position "1".





- 3** Install the wall plate to the wall using screws suitable for the wall material. Please note the orientation!

- 4** Attach the device to the wall having the pins meeting installation holes in the device.

! Please note the orientation!



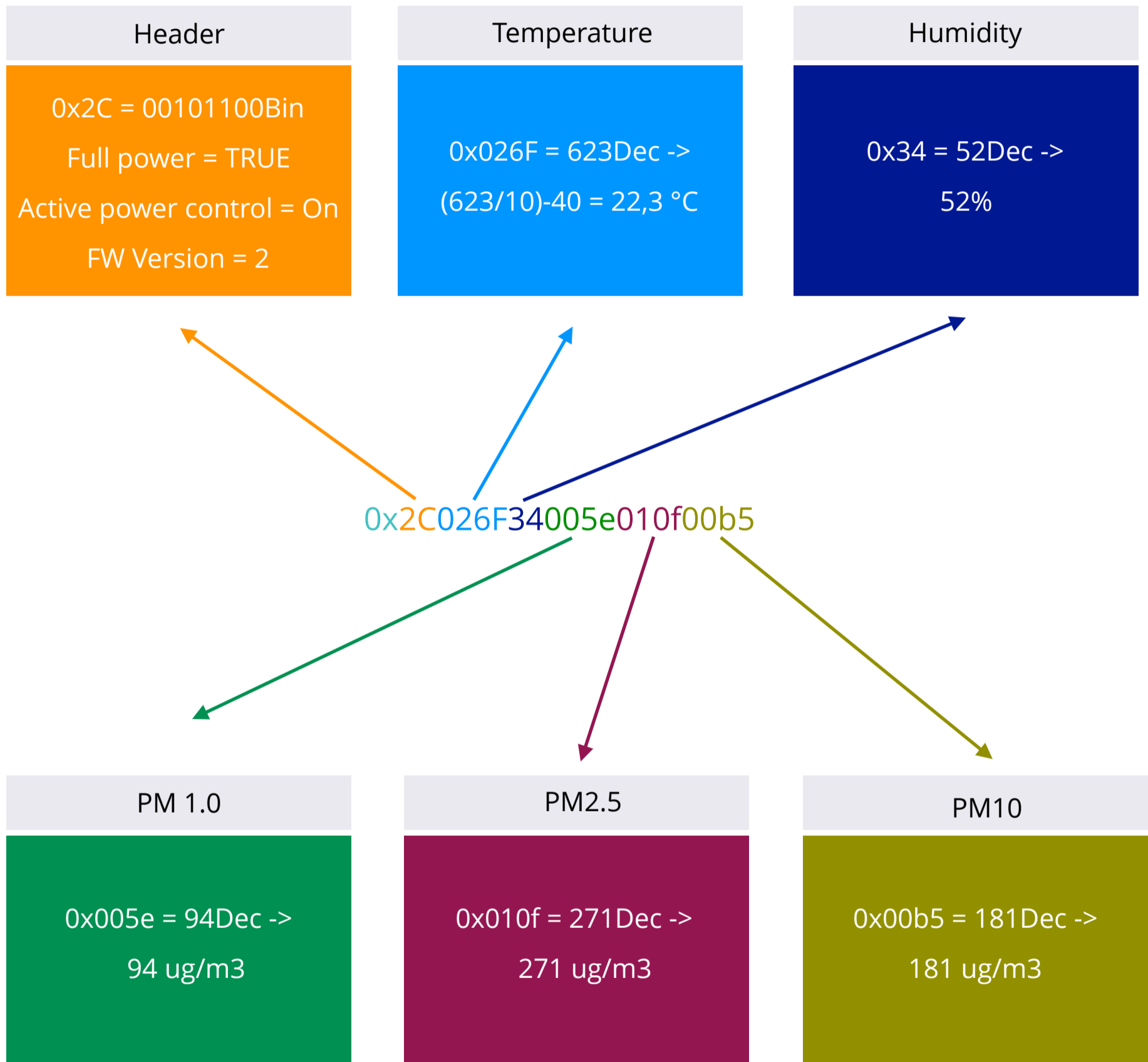
! Please note! Avoid placing device closer than 15cm from any metal or magnetic object, electric cables, electric devices or selective glass as this will dramatically reduce radio performance as well as battery life of the device.

Replacing Batteries

! Please NOTE! The device uses battery pack proprietary made. If the battery is considered dead, please contact Connected Inventions support for the replacement. Do not try to replace the battery with other brands available as there is a great risk of breaking the device. The battery should last years so in case of no reception, first check the power is switched on and that the radio coverage is available at the very location.

Uplink: Payload description

BYTE	BIT	TYPE	NAME	DESCRIPTION
0	0-1	UInt2	Reserved	Reserved
0	2	Boolean	Transmit power	Full power mode. 1= TRUE, 0 = FALSE
0	3	Boolean	Power Control	Active power control. 1= On, 0 = OFF
0	4-7	UInt4	FW version	FW version
1-2	0-15	UInt16	Temperature	(Value /10) - 40 = Temperature [°C] (Value /18) - 8 = Temperature [°F]
3	0-7	UInt8	Humidity	Humidity [%]
4-5	0-15	UInt16	min TVOC	Mass concentration [ug/m3]
6-7	0-15	UInt16	max TVOC	Mass concentration [ug/m3]
8-9	0-15	UInt16	average TVOC	Mass concentration [ug/m3]



Downlink

- Settings of the device can be updated with the downlink message
- Device requests new settings approximately every 24 hours
- You must be very careful when you update the settings
 - settings affect both the subscription and the battery life of the device!
- Downlink message is optional
 - If any downlink message is not received, device continues with the current settings
- How often messages are sent can be adjusted with the settings
- Default settings when device has not been configured with downlink:
 - Uplink reporting period is 30minutes
 - Adaptive Power Control is OFF
 - Full transmit power is used
- If the Adaptive power control feature is set on, the device will automatically adjust the transmit power to optimum level to save battery and create less unnecessary interference to radio network
 - By default power control is OFF
 - When power control is OFF, full TX power is used

! NOTE! The Adaptive power control feature is available only in RCZ1 device

Downlink: Payload description


BYTE	BIT	TYPE	DESCRIPTION
0	0-5		Reserved, set to 0
0	6	Boolean	Active power control. 1= On, 0 = Off
0	7	Boolean	DL Reconfigure enable 1= TRUE, 0 = FALSE
1	0-7	Uint8	Update interval. 5 min * (n+2) → 10min ... ~24h. Refer to Appendix 1.
2-7	all		Reserved, set to 0

Troubleshooting

- Ensure the power is switched on
- Check there is Sigfox network coverage available
- Ensure the device is not installed near metallic objects, electric cables, electric devices or selective windows.
- Metallic roofs, steel reinforced concrete, underground location and other obstacles can dramatically reduce radio signal.
- Check the operation mode of the device.
- Incorrect downlink configuration will affect the behaviour of the product.
- Ensure the configuration is properly done.

 solutions@connectedinventions.com

 +358 103115800

 Connected Inventions, Spektri Business Park, Kvintti Building,
Metsänneidonkuja 12, 02130 Espoo, Finland.

 [connectedfinland](#)

 [connected_fin](#)

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Technical Specification

Description	AirWits PM is a wireless IoT particulate matter, temperature and humidity metering device.
Size	98 x 98 x 43 mm
Weight	248 g
IP rating	IP20
Batteries	1xD 3.6 V LiSoCl2
Battery capacity	19000 mAh
Battery life	5 years with 30 min measuring interval
Sensors	Sensirion SPS30, SGPC3
Environment	Temperature -10 ... +60 °C Humidity 0 ... 95 % PM 0 ... 1000 ug/m3
Radio configurations	Sigfox 868 MHz (RCZ1), 902 MHz (RCZ2), 920 MHz (RCZ4)
Antenna	Internal helical antenna
Communication	Uplink & Downlink
Certification	FCC, CE, Sigfox Class 0U P_010A_9516_01 (RCZ1) P_010A_6C77_01 (RCZ2) P_010A_88EC_01 (RCZ4)
Product Code	CIPMM-3014-R0201 (RCZ1) CIPMM-3214-R0201 (RCZ2) CIPMM-3414-R0201 (RCZ4)



Appendix 1: Downlink message

Interval / min	Active Power Control On	Active Power Control Off
10	8000000000000000	C000000000000000
15	8001000000000000	C001000000000000
20	8002000000000000	C002000000000000
25	8003000000000000	C003000000000000
30	8004000000000000	C004000000000000
35	8005000000000000	C005000000000000
40	8006000000000000	C006000000000000
45	8007000000000000	C007000000000000
50	8008000000000000	C008000000000000
55	8009000000000000	C009000000000000
60	800A000000000000	C00A000000000000
65	800B000000000000	C00B000000000000
70	800C000000000000	C00C000000000000
75	800D000000000000	C00D000000000000
80	800E000000000000	C00E000000000000
85	800F000000000000	C00F000000000000
90	8010000000000000	C010000000000000
95	8011000000000000	C011000000000000
100	8012000000000000	C012000000000000
105	8013000000000000	C013000000000000
110	8014000000000000	C014000000000000
115	8015000000000000	C015000000000000
120	8016000000000000	C016000000000000
125	8017000000000000	C017000000000000
130	8018000000000000	C018000000000000
135	8019000000000000	C019000000000000
140	801A000000000000	C01A000000000000
145	801B000000000000	C01B000000000000
150	801C000000000000	C01C000000000000
155	801D000000000000	C01D000000000000
160	801E000000000000	C01E000000000000
165	801F000000000000	C01F000000000000
170	8020000000000000	C020000000000000
175	8021000000000000	C021000000000000
180	8022000000000000	C022000000000000
185	8023000000000000	C023000000000000
190	8024000000000000	C024000000000000
195	8025000000000000	C025000000000000
200	8026000000000000	C026000000000000
205	8027000000000000	C027000000000000

210	8028000000000000	C028000000000000
215	8029000000000000	C029000000000000
220	802A000000000000	C02A000000000000
225	802B000000000000	C02B000000000000
230	802C000000000000	C02C000000000000
235	802D000000000000	C02D000000000000
240	802E000000000000	C02E000000000000
245	802F000000000000	C02F000000000000
250	8030000000000000	C030000000000000
255	8031000000000000	C031000000000000
260	8032000000000000	C032000000000000
265	8033000000000000	C033000000000000
270	8034000000000000	C034000000000000
275	8035000000000000	C035000000000000
280	8036000000000000	C036000000000000
285	8037000000000000	C037000000000000
290	8038000000000000	C038000000000000
295	8039000000000000	C039000000000000
300	803A000000000000	C03A000000000000
305	803B000000000000	C03B000000000000
310	803C000000000000	C03C000000000000
315	803D000000000000	C03D000000000000
320	803E000000000000	C03E000000000000
325	803F000000000000	C03F000000000000
330	8040000000000000	C040000000000000
335	8041000000000000	C041000000000000
340	8042000000000000	C042000000000000
345	8043000000000000	C043000000000000
350	8044000000000000	C044000000000000
355	8045000000000000	C045000000000000
360	8046000000000000	C046000000000000
365	8047000000000000	C047000000000000
370	8048000000000000	C048000000000000
375	8049000000000000	C049000000000000
380	804A000000000000	C04A000000000000
385	804B000000000000	C04B000000000000
390	804C000000000000	C04C000000000000
395	804D000000000000	C04D000000000000
400	804E000000000000	C04E000000000000
405	804F000000000000	C04F000000000000
410	8050000000000000	C050000000000000
415	8051000000000000	C051000000000000

420	8052000000000000	C052000000000000
425	8053000000000000	C053000000000000
430	8054000000000000	C054000000000000
435	8055000000000000	C055000000000000
440	8056000000000000	C056000000000000
445	8057000000000000	C057000000000000
450	8058000000000000	C058000000000000
455	8059000000000000	C059000000000000
460	805A000000000000	C05A000000000000
465	805B000000000000	C05B000000000000
470	805C000000000000	C05C000000000000
475	805D000000000000	C05D000000000000
480	805E000000000000	C05E000000000000
485	805F000000000000	C05F000000000000
490	8060000000000000	C0600000000000000
495	8061000000000000	C061000000000000
500	8062000000000000	C062000000000000
505	8063000000000000	C063000000000000
510	8064000000000000	C064000000000000
515	8065000000000000	C065000000000000
520	8066000000000000	C066000000000000
525	8067000000000000	C067000000000000
530	8068000000000000	C068000000000000
535	8069000000000000	C069000000000000
540	806A000000000000	C06A000000000000
545	806B000000000000	C06B000000000000
550	806C000000000000	C06C000000000000
555	806D000000000000	C06D000000000000
560	806E000000000000	C06E000000000000
565	806F000000000000	C06F000000000000
570	8070000000000000	C0700000000000000
575	8071000000000000	C071000000000000
580	8072000000000000	C072000000000000
585	8073000000000000	C073000000000000
590	8074000000000000	C074000000000000
595	8075000000000000	C075000000000000
600	8076000000000000	C076000000000000
605	8077000000000000	C077000000000000
610	8078000000000000	C078000000000000
615	8079000000000000	C079000000000000
620	807A000000000000	C07A000000000000
625	807B000000000000	C07B000000000000
630	807C000000000000	C07C000000000000
635	807D000000000000	C07D000000000000
640	807E000000000000	C07E000000000000
645	807F000000000000	C07F000000000000

650	8080000000000000	C080000000000000
655	8081000000000000	C081000000000000
660	8082000000000000	C082000000000000
665	8083000000000000	C083000000000000
670	8084000000000000	C084000000000000
675	8085000000000000	C085000000000000
680	8086000000000000	C086000000000000
685	8087000000000000	C087000000000000
690	8088000000000000	C088000000000000
695	8089000000000000	C089000000000000
700	808A000000000000	C08A000000000000
705	808B000000000000	C08B000000000000
710	808C000000000000	C08C000000000000
715	808D000000000000	C08D000000000000
720	808E000000000000	C08E000000000000
725	808F000000000000	C08F000000000000
730	8090000000000000	C090000000000000
735	8091000000000000	C091000000000000
740	8092000000000000	C092000000000000
745	8093000000000000	C093000000000000
750	8094000000000000	C094000000000000
755	8095000000000000	C095000000000000
760	8096000000000000	C096000000000000
765	8097000000000000	C097000000000000
770	8098000000000000	C098000000000000
775	8099000000000000	C099000000000000
780	809A000000000000	C09A000000000000
785	809B000000000000	C09B000000000000
790	809C000000000000	C09C000000000000
795	809D000000000000	C09D000000000000
800	809E000000000000	C09E000000000000
805	809F000000000000	C09F000000000000
810	80A0000000000000	C0A0000000000000
815	80A1000000000000	C0A1000000000000
820	80A2000000000000	C0A2000000000000
825	80A3000000000000	C0A3000000000000
830	80A4000000000000	C0A4000000000000
835	80A5000000000000	C0A5000000000000
840	80A6000000000000	C0A6000000000000
845	80A7000000000000	C0A7000000000000
850	80A8000000000000	C0A8000000000000
855	80A9000000000000	C0A9000000000000
860	80AA000000000000	C0AA000000000000
865	80AB000000000000	C0AB000000000000
870	80AC000000000000	C0AC000000000000
875	80AD000000000000	C0AD000000000000

880	80AE000000000000	C0AE000000000000
885	80AF000000000000	C0AF000000000000
890	80B0000000000000	C0B0000000000000
895	80B1000000000000	C0B1000000000000
900	80B2000000000000	C0B2000000000000
905	80B3000000000000	C0B3000000000000
910	80B4000000000000	C0B4000000000000
915	80B5000000000000	C0B5000000000000
920	80B6000000000000	C0B6000000000000
925	80B7000000000000	C0B7000000000000
930	80B8000000000000	C0B8000000000000
935	80B9000000000000	C0B9000000000000
940	80BA000000000000	C0BA000000000000
945	80BB000000000000	C0BB000000000000
950	80BC000000000000	C0BC000000000000
955	80BD000000000000	C0BD000000000000
960	80BE000000000000	C0BE000000000000
965	80BF000000000000	C0BF000000000000
970	80C0000000000000	C0C0000000000000
975	80C1000000000000	C0C1000000000000
980	80C2000000000000	C0C2000000000000
985	80C3000000000000	C0C3000000000000
990	80C4000000000000	C0C4000000000000
995	80C5000000000000	C0C5000000000000
1000	80C6000000000000	C0C6000000000000
1005	80C7000000000000	C0C7000000000000
1010	80C8000000000000	C0C8000000000000
1015	80C9000000000000	C0C9000000000000
1020	80CA000000000000	C0CA000000000000
1025	80CB000000000000	C0CB000000000000
1030	80CC000000000000	C0CC000000000000
1035	80CD000000000000	C0CD000000000000
1040	80CE000000000000	C0CE000000000000
1045	80CF000000000000	C0CF000000000000
1050	80D0000000000000	C0D0000000000000
1055	80D1000000000000	C0D1000000000000
1060	80D2000000000000	C0D2000000000000
1065	80D3000000000000	C0D3000000000000
1070	80D4000000000000	C0D4000000000000
1075	80D5000000000000	C0D5000000000000
1080	80D6000000000000	C0D6000000000000
1085	80D7000000000000	C0D7000000000000
1090	80D8000000000000	C0D8000000000000
1095	80D9000000000000	C0D9000000000000
1100	80DA000000000000	C0DA000000000000
1105	80DB000000000000	C0DB000000000000

1110	80DC000000000000	C0DC000000000000
1115	80DD000000000000	C0DD000000000000
1120	80DE000000000000	C0DE000000000000
1125	80DF000000000000	C0DF000000000000
1130	80E0000000000000	C0E0000000000000
1135	80E1000000000000	C0E1000000000000
1140	80E2000000000000	C0E2000000000000
1145	80E3000000000000	C0E3000000000000
1150	80E4000000000000	C0E4000000000000
1155	80E5000000000000	C0E5000000000000
1160	80E6000000000000	C0E6000000000000
1165	80E7000000000000	C0E7000000000000
1170	80E8000000000000	C0E8000000000000
1175	80E9000000000000	C0E9000000000000
1180	80EA000000000000	C0EA000000000000
1185	80EB000000000000	C0EB000000000000
1190	80EC000000000000	C0EC000000000000
1195	80ED000000000000	C0ED000000000000
1200	80EE000000000000	C0EE000000000000
1205	80EF000000000000	C0EF000000000000
1210	80F0000000000000	C0F0000000000000
1215	80F1000000000000	C0F1000000000000
1220	80F2000000000000	C0F2000000000000
1225	80F3000000000000	C0F3000000000000
1230	80F4000000000000	C0F4000000000000
1235	80F5000000000000	C0F5000000000000
1240	80F6000000000000	C0F6000000000000
1245	80F7000000000000	C0F7000000000000
1250	80F8000000000000	C0F8000000000000
1255	80F9000000000000	C0F9000000000000
1260	80FA000000000000	C0FA000000000000
1265	80FB000000000000	C0FB000000000000
1270	80FC000000000000	C0FC000000000000
1275	80FD000000000000	C0FD000000000000
1280	80FE000000000000	C0FE000000000000
1285	80FF000000000000	C0FF000000000000