

# Z-Wave IR Extender PAR01



PAR01, is a Z-Wave plus compliant Z-Wave-to-IR Bridge to control split air conditioner by receiving Z-Wave command and translating to Infrared command. With its comprehensive built-In and cloud-stored IR database (library). PAR01 can control different brands and models of air conditioners worldwide.

PAR01 is a security enabled Z-Wave plus device. A security Enabled Z-Wave Plus Controller must be used in order to fully utilize the product.

PAR01 is a Z-Wave slave device, it depends on gateway to setup particular AC brand with correct IR code. Different gateway has different user interface for setup.

This product can be included and operated in any Z-Wave™ network with other Z-Wave™ certified devices from other manufacturers and/or other applications. All non-battery operated nodes within the network will act as repeaters regardless of vendor to increase reliability of the network.

The device adopts the Z-Wave™ 500 series chip, when your Z-Wave™ network system is all made by Z-Wave™ 500 series devices. The network system will have the advantages as below.

## Adding to Z-Wave™ Network

In the first time, activate the device through battery, then it can be added into the Z-Wave™ network. First, make sure the primary controller is in the add mode. And then power on the device. The device will auto start the NWI (Network Wide Inclusion) mode. And it should be added in 5 seconds. You will see the LED light ON one second.

Function	Description
Add	<ol style="list-style-type: none"><li>1. Have Z-Wave™ Controller entered add mode.</li><li>2. Press the add key in the casing three times</li><li>3. After add successful, the device will wake to receive the setting command from Z-Wave™ Controller about 20 seconds.</li></ol>
Remove	<ol style="list-style-type: none"><li>1. Have Z-Wave™ Controller entered remove mode.</li><li>2. Press the add key in the casing three times</li><li>3. Hold down the central key, then press the top-right key three times within 1.5 seconds to enter the remove mode. Node ID has been excluded.</li></ol>
Reset??	<p><b><i>Notice: Use this procedure only in the event that the primary controller is lost or otherwise inoperable.</i></b></p> <ol style="list-style-type: none"><li>1. Hold down the central key, then press the top-right key four times within 1.5 seconds and do not release the top-right key in the 4<sup>th</sup> pressed, and the LED will light ON. Note: PSR03-C is reset by pressing panic key four times within 1.5 seconds and do not release the top-right key in the 4<sup>th</sup> pressed.</li><li>2. After 3 seconds the LED will turn OFF, after that within 2 seconds, release the keys. If successful, the LED will light ON one second. Otherwise, the</li></ol>

	LED will flash once. 3. IDs are remove and all settings will reset to factory default.
Association	Please consult your Gateway supplier for more detail. Normally, User can ignore this step during the setup. PAR01 supports 1 association group Association Group #1 Association Group #1 (max. 1 node) is default to associate with the primary controller (Gateway/Hub/Controller) for AC Master Status change report, refer to below for report details: <ul style="list-style-type: none"> <li>• Current Room Temperature (report in precision of 0.5°C or 1°F) (It will be according to Configuration Parameter 39 setting to decide the trigger level)</li> <li>• Current Battery Level (Only apply in Low Battery Warning happened)</li> <li>• Device Reset Locally Notification (Only report when the AC Master has been triggered the RESET TO DEFAULT)</li> </ul>
	<ul style="list-style-type: none"> <li>• Including a node ID allocated by Z-Wave™ Controller means “<b>Add</b>” or “<b>Inclusion</b>”. Excluding a node ID allocated by Z-Wave™ Controller means “<b>Remove</b>” or “<b>Exclusion</b>”.</li> <li>• Failed or success in including/excluding the node ID can be viewed from Z-Wave™ Controller.</li> </ul>

**Notice 1:** The device can not work normally in the first time. Please make sure the battery is full before the first use.

**Notice 2:** Always RESET a Z-Wave™ device before trying to add it to a Z-Wave™ network.

## Get Started

### **Step 1 Apply Power to PAR01**

- Open the PAR01 Casing
- Install CR123 batteries
- PAR01 will detect the first applied power source to decide what Z-Wave device role it will be in after included into the Z-Wave gateway: battery= sleeping device (FLiRS mode).
- Once the PAR01 is included into a Z-Wave network, the working mode (sleeping or awake) cannot be changed, unless it is excluded and re-apply the power.
- PAR01 can be included and operated in any Z-Wave network with other Z-Wave certified devices from other manufacturers and/or other applications. All non-battery operated nodes within the network will act as repeaters regardless of Vendor to increase reliability of the network.

### **Step 2 Include PAR01 to a Z-Wave Gateway**

Step Procedure / Description Status Indicator

1. Refer to your primary controller to enter into the Inclusion Mode or Exclusion Mode
2. When it is prompted to enter it, please triple click the “PROG” button within 1 second. Green Indicator flashes TWICE then stay off

*Notes:*

1. It is recommended to perform the Remove (Exclude) procedure before performing an Add (Include) procedure.
2. Red Indicator flashes TWICE then stay off to represent the Add / Remove process failed, please repeat the above step again.

### **Step 3 Setup Automatic Status Report Association to Gateway**

- Please consult your Gateway supplier for more detail. Normally, User can ignore this step during the setup.

PAR01 supports 1 association group

Association Group #1

Association Group #1 (max. 1 node) is default to associate with the primary controller (Gateway/Hub/Controller) for the Status change report, refer to below for report details:

- Current Room Temperature (report in precision of 0.5°C or 1°F) (It will be according to Configuration Parameter 39 setting to decide the trigger level)
- Current Battery Level (Only apply in Low Battery Warning happened)

#### ***Step 4 Setup Air Conditioner IR code***

- The UI of set up the IR code varies from different gateways. If gateways have dedicated UI for the IR code setup please refer to the gateway UI and ignore the below steps.
- If your gateway does not have dedicated UI for PAR01 code setup, but support Z-Wave thermostat Command Class and Configuration Command Class. You may refer to below steps to setup the IR code using the configuration options in your gateway.

## **Important Information**

- Different brand or model of air conditioner has different function. For example, some air conditioner only support temperature set from 18°C - 30°C, if user set 17°C on gateway, AC Master will not respond.
- There are more than 1 code for each brand, some does not support Heat, if User selected a code that does not support Heat but Original air conditioner supports Heat Function, please continue to try next code until the correct one is selected.
- You can record down your Device Code for future reference after setting up the PAR01 correctly.

## **IR Code Learning**

Step Procedure / Description Status Indicator

1.Refer to your primary controller user manual, enter to the browser page that can input the Configuration parameter

2.Look up Below mapping table for learning, and decide the IR setting you intend to learn next.

3.Open the Gateway's Configuration Brower page input parameter number "25" and parameter value (according to below Mapping Table), then complete the Configuration process.  
Then Green Indicator still turns ON for indicating the IR Code Learning Start

4.Aim the Original Air Conditioner Remote at AC Master according to below position within 1-3cm Press "Power ON" button on the Original Air Conditioner Remote.

If the Learning is failed, repeat Step 3 to step 4

To learn next IR code, repeat Step 2 to step 4.

Successful: Green Indicator flashes TWICE

Unsuccessful: Red Indicator flashes TWICE.

5.Once you finished the IR Code Learning, please go to Configuration setting page on the Gateway browser and input parameter number "27" and parameter value "000" to select the dedicated AC code number "000" for learning.

Green Indicator flashes ONCE every time if receives a command from Gateway

### Tips

- Make sure your Original Remote is in Power OFF Status.
- Make sure your Original Remote set FAN Speed to AUTO and FAN SWING to AUTO/ON
- Press and Hold the Power Key on Original Remote UNTIL AC Master indicate Successful or Not.
- User need at least Learn the OFF (Parameter Value 0), and one Temperature Mode (Parameter Value 2 ~ 28) to complete the usage model.
- Keep away from Incandescent Light or Direct Sunlight during learning.
- Make sure IR Transmitter of your Original Remote align with learning diode of AC Master, you may also slight adjust closer or further away the distance of two devices. Some of Remotes the IR transmitter is hidden behind lens and may not be installed at the center of the remote.
- Make sure the power is good on both devices, especially the Original remote. Use Fresh Batteries in both devices recommended.

IR Learning Mapping Table (Parameter Number 25)

Parameter Value (Storage Location)	Thermostat Command & IR Setting	
	Storage in Celsius Unit	Storage in Fahrenheit Unit
0	OFF	OFF
1	ON(Resume)	ON(Resume)
2	17°C COOL	63°F COOL
3	18°C COOL	64°F COOL
4	19°C COOL	66°F or 67°F COOL
5	20°C COOL	68°F or 69°F COOL

6	21°C COOL	70°F or 71°F COOL
7	22°C COOL	72°F or 73°F COOL
8	23°C COOL	74°F or 75°F COOL
9	24°C COOL	76°F COOL
10	25°C COOL	77°F or 78°F COOL
11	26°C COOL	79°F or 80°F COOL
12	27°C COOL	81°F or 82°F COOL
13	28°C COOL	83°F or 84°F COOL
14	29°C COOL	85°F COOL
15	30°C COOL	86°F COOL
16	17°C HEAT	63°F HEAT
17	18°C HEAT	64°F HEAT
18	19°C HEAT	66°F or 67°F HEAT
19	20°C HEAT	68°F or 69°F HEAT
20	21°C HEAT	70°F or 71°F HEAT
21	22°C HEAT	72°F or 73°F HEAT
22	23°C HEAT	74°F or 75°F HEAT
23	24°C HEAT	76°F HEAT
24	25°C HEAT	77°F or 78°F HEAT
25	26°C HEAT	79°F or 80°F HEAT
26	27°C HEAT	81°F or 82°F HEAT
27	28°C HEAT	83°F or 84°F HEAT
28	29°C HEAT	85°F HEAT
29	30°C HEAT	86°F HEAT
30	DRY Mode	DRY Mode

31	AUTO Mode	AUTO Mode
32	FAN Mode	FAN MODE

### Important Information

- After all learning completed, User can go back to the control page on the gateway for normal operation.
- On the Gateway UI, User can only use the Temperature range from the mapping table, OFF, ON(RESUME), COOL, HEAT, DRY MODE, AUTO MODE and FAN MODE.
- If User only learnt ON(RESUME), OFF, or part of the settings according to the above table, PAR01 will send the learnt data to the Air Conditioner only. For example, User only learnt ON(RESUME), OFF, 22°C COOL, 24°C HEAT, PAR01 will not send the IR Data to Air Conditioner if User set 27°C Cool on the gateway.
- User can still use gateway to set up Scene and Schedule with PAR01. For example, to have AC turn on at 23°C every day at 7am, 25°C at 11pm. Just make sure the set code is learnt.
- The learning mapping table is for split Air Conditioner, which Remote Control is with LCD Display. For Window type Air Conditioner (which Remote Control is without LCD Display), the mapping table with temperatures do not apply, due to different type of IR Control Protocol. However, User may still use OFF, ON(RESUME), DRY, AUTO or FAN Key for Learning.
- (Because the POWER key on the Original Remote (without LCD Display) is toggle, user can choose either ON key or OFF key to learn Power key. After Learning is done, press once to turn on the Air Conditioner if the Air Conditioner is OFF, press once to turn OFF if the Air Conditioner is ON)

Functions	Parameter Number	Parameter Value	Size ( bytes)
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Learn IR code	25 (0x19)	Default: 0x0000 range: (0x0000 to 0x20) refer to learning mapping table	2
Check IR Code Learning Status (Read Only)	26(0x1A)	Default: 0x00 range: 0 to 4 (0x00 to 0x04) 0(0x00) : Idle - IR Channel is idle 1(0x01) : OK - the last learning operation was completed successfully  2(0x02) : Learning - PAR01 is busy processing previous learning request  3(0x03) : Full – All locations are being Used.  4(0x04) : The last learning request was failed Note: The status value 0x01 and 0x04 will be reset to 0x00 after PAR01 receives a get command to this parameter.	1
Set IR Code number from built-in code library	27 (0x1B)	Refer to Code Finder Webpage.	2

Set Built-in IR Emitter Control ( If there have two or more Air Conditioners with the same code set that are used in the same room, user can disable the built-in IR emitter and use the external IR emitter cable to control each air conditioner	32 (0x20)	Default: 0xFF 0 or 255 (0x00 or 0xFF) 0(0x00): Disable 255(0xFF): Enable (Default)	1
Control Air Conditioner "SWING" function	33 (0x21)	Default: 0x01 Range 0 to 1 (0x00 or 0x01) 0(0x00) : Swing OFF 1(0x01) : Swing Auto (Default)	1

Calibrate temperature reading	37 (0x25)	Temperature offset value. 0(0x00) = 0°C (Default) 1(0x01) = 1°C 2(0x02) = 2°C 3(0x03) = 3°C 4(0x04) = 4°C 5(0x05) = 5°C 255(0xFF) = -1°C 254(0xFE) = -2°C 253(0xFD) = -3°C 252(0xFC) = -4°C 251(0xFB) = -5°C Temperature offset value.	= 0°C (Default) = 1°C = 2°C = 3°C = 4°C = 5°C
		0(0x00) = 0°C (Default) 1(0x01) = 1°C 2(0x02) = 2°C	= 0°C (Default) = 1°C = 2°C

Set Auto Report Condition Trigger By Room Temperature Change	30 (0x1E)	0(0x00) = Disable AUTO report function (Default) (for saving battery life) Auto report if room temperature is different from last report. 1(0x01) = 1°F (0.5°C) 2(0x02) = 2°F (1°C) 3(0x03) = 3°F (1.5°C) 4(0x04) = 4°F (2°C) 5(0x05) = 5°F (2.5°C) 6(0x06) = 6°F (3°C) 7(0x07) = 7°F (3.5°C) 8(0x08) = 8°F (4°C)	1
Set Auto Report Condition By Time Interval	34 (0x22)	Auto report by the following time interval. 1(0x01) = 1 Hr 2(0x02) = 2 Hrs 3(0x03) = 3 Hrs 4(0x04) = 4 Hrs	1

	5(0x05) = 5 Hrs 6(0x06) = 6 Hrs 7(0x07) = 7 Hrs 8(0x08) = 8 Hrs (Default)	
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*Note:*

*All the above Parameter Number and Value is in Hexadecimal Numbering Format, if the Gateway only support decimal numbering format, please change it to decimal value accordingly.*

### **Reset to Factory Default**

**Press and Hold "PROG" button for 3 seconds on AC Master, the Green Indicator will light up. DO NOT Release the "PROG" Button until Green Indicator flashes TWICE.**

### **Z-Wave™ Notification**

After the device adding to the network, it will wake-up once per day in default. When it wake-up it will broadcast the "Wake Up Notification" message to the network, and wake-up 10 seconds for receive the setting commands.

To wake-up the device immediately, please hold down the program key, and press the top-right key once.

### **Z-Wave™ Message Report**

When the panic triggered, the device will report the trigger event and also report the battery status.

## Activate the power

### \* Battery Power Check

When any keys around the central key is pressed, the device will check the battery power. If the power level is too low, the red LED will flash once after pressing. Please charge the device through micro USB immediately.

### \* NWI

When the device is activated, the device will check is it already adding to the network? If doesn't, it will auto start the NWI mode. The LED will flash in every second and continue 30 seconds. Until timeout or the device successful to add by controller. Users can hold down the central key, then press the top-right key three times within 1.5 seconds to abort the NWI mode.

## Over The Air (OTA) Firmware Update

The device support the Z-Wave firmware update via OTA. Let the controller into the firmware update mode, and then wake up the device to start the update. After finish the firmware download, the LED will start flash in every 0.5 second. Wait the LED stop flash, the firmware update is succeeded. **Caution:** Do not running the OTA when the battery is running low.

## Spec

Power by Li 602025 battery.

Signal (Frequency):

868.40 MHz, 869.85 MHz(EU),  
908.40 MHz, 916.00 MHz(US),  
922~927 MHz(JP/TW),  
921.40 MHz, 919.80 MHz(ANZ),

869.00 MHz(RU),  
865.20 MHz(IN),  
916.00 MHz(IL),

RF Maximum Power: +5dBm

Range:

Minimum 40 meters indoor, 100 meters outdoor line of sight.

Operating Temperature: 0°C ~ 40°C

For indoor use only.

Specifications subject to change without notice due to continuing product improvement.



## Disposal



This marking indicates that this product should not be disposed with other household wastes throughout the EU. To prevent possible harm to the environment or human health from uncontrolled waste disposal, recycle it responsibly to promote the sustainable reuse of material resources. To return your used device, please use the return and collection systems or contact the retailer where the product was purchased. They can take this product for environmental safe recycling.

Company of License Holder : Philio Technology Corporation

Address of License Holder : 8F, No.653-2, Zhongzheng Rd., Xinzhuang





COAIRE	46									
COMBINE	489									
COMFEE	40									
COMFORTAIRE	672	606	429	820	55	46				
COMFORTSTAR	292	606	78	40	35					
CONCORD	489									
CONFORT MASTER	380									
CONROWA	319	113	70	37						
CONSUL	621	469	468							
CONTINENTAL EDISON	40									
COOLINE	46									
COOLRECH	4									
COOLWEX	428	18								
CORONA	288	1140	1138	1137	1132	1126	456	455	454	453
	452	451	450	449	448					
CRYSTAL	54									
DAEWOO	70	40								
DAIKIN	11	6	627	601	597	366	321	313	290	289
	1189	1164	1121	1037	1034	1030	1026	829	786	394
	367	324	1063	1007	887	602	26	1	1094	1075
	978	971	876	875	861	608	511	374	373	325
	261	211	163	162	32	30	2	384	270	269
	268	267	266	265	264	29	353	349	345	344
	343	33	31	543	357	354				
DAITSU	788									
DANTEX	841	797								
DEER(SHUANGLU)	592	1047								
DELCHI	40									
DELONGHI	819	818	787	91	46	503	13			
DEMIRDOKUM	42	186								

DIAMANT	106									
DIMSTAL	545									
DOCTOR	846	771	756	722						
DONGBAO	652	646	654							
DUCTLESSAIRE	186	55								
DURAMAXX	545									
ECOAIR	429	42	18							
ELCO	713	432								
ELECISM	1011									
ELECTRA	1165	433	432	467	466	465				
ELECTROLUX	611	584	578	295	40	994	292	88	646	623
	654	55	297							
ELGIN	57									
ELSONIC	1175									
EMAILAIR	504	153	34							
EUROPACE	1093	629	606	984	983	429	40			
FAGOR	40									
FANAIR	1058									
FANWORLD	380									
FEDDERS	812	764	762	729	276					
FEILU	319	494								
FERROLI	1058									
FIRSTLINE	83									
FORTRESS	639	40								
FRESTEC(FRESTECH)	587	581	1056	1046						
FRIEDRICH	832	783	606	540						
FRIGIDAIRE	1058	1002	46	275	274	273				
FRIGOLINE	88									
FROST	567	566								
FUJI ELECTRIC	1113									
FUJIAIR	638	54								
FUJIAIRE	542									
FUJIMARU	567	527								

FUJITSU	671	1024	1021	821	204	1033	1032	1031	1029	1023
	893	892	870	25	16	1081	1039	1025	1022	616
	540	539	459	334	333	202	1090	853	852	335
	227	206	205	203	201	200	199	161	160	159
	158	34	27							
FUJITSU GENERAL	671	1024	1021	821	204	1023	25	16	1025	1022
	34	27								
FUNAI	482	766	728	726						
FUNIKI	580									
GALANZ	537	381	277	86	1147	1082	193	488	473	83
	70	4								
GALLETTI	40									
GE (GENERAL ELECTRIC)	40	637	292							
GENERAL	671	1024	1021	821	204	1113	1023	25	16	1025
	1022	1187	1186	57	34	27				
GERMAN POOL	1019	1020	292	1185	1058	817				
GIBSON	513	839	525	524	523	522	521	520	519	518
	517	516	515	514	508	40				
GORENJE	46	55								
GREE	645	644	376	1058	823	672	395	292	18	429
	15	659	658	656	606	508	195	155	154	69
GREENE	588									
GSG	891									
GUANGDA	319	113	37	20						
GUQIAO	498									
HAIER	1061	835	830	655	417	1003	999	836	406	256
	75	657	535	257	210	209	208	207	198	197
	172	156	77	76	23					
HAMILTON DIGITAL	186									
HAWRIN	894									

HERAN	807	40	429	56	421	869	868	867	866	851
	850	565	562	550	55					
HESSTAR	380									
HISENSE	975	828	382	80	12	10	427	410	68	9
405										
HITACHI	600	599	418	403	291	1036	1035	1012	878	877
	864	39	1173	1105	1065	1052	642	472	415	390
	186	120	52	42	1178	974	973	879	865	436
	391	375	263	262	260	259	258	255	53	51
	50	339	299	298						
HONEYWELL	833	980								
HUABAO	1018	995	618	509						
HUAGAO	1001									
HUALING	193	547	476	70	56	37				
HUIFENG	996	493	113							
HYUNDAI	1125	479	1179	481	480					
IATU	40									
IDEMA	40									
INVENTOR	292									
INYAN(YINYAN)	1067	70								
JDC	768	755	725							
JINSONG	646	654								
JINTNC	897									
JOHSON	153									
KANG LI	43									
KAYSUN	40									
KELON	12	411	409	489	487	486	485	143	14	13
KELVINATOR	87	46	17							
KLIMAIRE	512	46	40							
KLIMATAIR	767	757	744	724						
KOLIN	810	776	534	533	532	531	530	529	206	44
KOMEKO	40	88	46							
KONKA	193	42	70							
LENNOX	292	186	42	606	69	54	46	18	15	4

LEVANTE	46									
LG	820	294	1111	832	817	648	615	464	91	17
	82	81								
LITTLE DUCK	770	765	740	739	738	737	736	720		
LITTLE SWAN	653	650	649	646	193	654				
LLOYD	186									
LOREN-SEBO	844	760	759	751						
MACRO	489									
MAXE	1181	791	789	574	573	572	571	570	569	568
	567	559	558	505	500					
MAXXCOOL	545									
MCQUAY	576	575	606	496	470	196				
MEICO	41									
MEITAV	714									
MIDEA	589	579	40	972	512	56	55	54	46	78
	79	48	113							
MIDEA_TOSHIBA	48									
MILLER	512	292	42	58	57	55	54	46	40	
MIRAGE	69	18	15							
MITSUBISHI	320	314	286	484	385	327	233	42	387	305
	304	303	302	285	284	283	282	281	280	279
	249	248	247	246	245	244	194	311	308	307
113										
MITSUBISHI ELECTRIC	595	603	326	315	287	1184	1183	1182	1118	1064
	1038	992	991	842	594	393	1177	1176	1100	541
	528	498	484	392	371	240	239	238	236	235
	234	232	231	230	229	228	193	70	37	1117
	982	981	884	883	882	881	500	355	351	237
	186	176	153	93	57	35	340	347		
MITSUBISHI(HEAVY INDUSTRIES)	346	322	319	317	316	278	1095	1084	574	568

	356	329	243	36	1174	837	547	386	383	370
	363	361	360	359	350	338	328	254	253	252
	251	250	184	165	164	133	132	131	119	118
	117	116	115	114	113	79	38	20	310	309
306										
MRCOOL	512									
MULTIAQUA	834									
NATIONAL	402	872	401	369	211	420	404			
NEC	170	169	168	167	166	152	148	147	146	142
	141	140	139	138	137	136	135	134	130	129
	128	127								
NEO	186									
NEOKA	1042									
NEWCLIME	292									
NORITZ	772	754								
O GENERAL	25									
OLIMPIA SPLENDID	40									
OLIMPO	46									
OLYMPUS	667	666								
OSAKA	68									
PANASONIC	674	673	583	323	293	211	47	1123	1122	1120
	1119	1114	990	872	871	855	849	822	813	675
	462	461	609	544	378	186	95	42	1171	1145
	1006	854	502	491	490	437	389	379	372	368
	365	242	241	191	185	183	92	65	64	63
	62	61	362	337	336					
PANDA	28									
PEARL	548									
PHILCO	778	41	40							
PIONEER	380	70	46	40						
PREMIUM	40									
PRIDIOM	57									
PROTON	790	569								

QLIMA	40									
QUIETSIDE	1058	186	42							
RAMSOND	545									
RASONIC	1116	1114	394							
RECCO	538									
REETECH	40									
REMKO	40									
RENFOS	806	40	889	1180	568	563	551			
RIELLO	506									
RIEWITEC	57									
ROLBIT ELECTRONIC	719									
ROLSEN	582									
ROWA	651	626	619							
RYOBISHI	1112									
SABRO	774	769	763	727						
SAGA	714	712	711	710	709	708	707	706	705	704
	703	702	701	700	699	698	697	696	695	694
	693	692	691	690	689	688	687	686	685	684
	683	682	681	680	679	678	677	676	661	660
	659	658	657	656						
SAIJO-DENKI	742	741	721							
SAMPO	1060	808	804	863	862	848	847	1041	422	569
	562	561	556	555	554	552	550	549		
SAMSUNG	590	510	301	300	1124	634	633	632	631	630
	612	477	49	1169	1000	998	425	84	74	73
	1148	985	888	438	171	149				
SANSUI	735	730	378							
SANYO	586	46	1027	849	609	218	1141	1136	1135	1134
	1133	1028	874	860	536	478	187	170	169	168
	167	166	152	148	147	146	142	141	140	139
	138	137	136	135	134	130	129	128	127	60

	59	48	45							
SASUKI	773	758	750							
SAUNIER DUVAL	18	40								
SCHNEIDER ELECTRIC	42									
SENVILLE	512	78	55							
SHANGLING	70									
SHARP	809	816	815	636	318	1168	623	458	426	388
	364	90	1170	1167	1127	840	352	341	217	216
	215	214	213	212	192	157	145	144	143	8
	66	7								
SHINCO	85	22								
SHINING	70									
SHUAIKANG	582									
SIEMENS	46									
SIMON-AIRE	608									
SKG	989									
SLICK	714									
SMARTTECH	218									
SOLEUS	395	380	18							
SOVA	845	753	752							
SPRINGER	88									
SUPER GENERAL	57									
SURREY	512	55								
SWIFT	784									
SYNCO	735	734	733	732	731					
TADIRAN	40	843	749	748	747	746	745	471	54	48
46										
TAKADA	1014									
TATUNG	896	895	527	526						
TCL	548	545	434	380	193	547	546	24		
TECO	803	859	858	857	856	513	48	508	423	839
	525	524	523	522	521	520	519	518	517	516
	515	514	40							

