

2. Specification

2-1. GSM General Specification

	EGSM 900	DCS 1800	PCS 1900	WCDMA 900	WCDMA 2100	W1900
Freq. Band[MHz] Uplink/Downlink	880~915 925~960	1710~1785 1805~1880	1850~1910 1930~1990	824~849 869~894	1920~1980 2110~2170	1850~1910 1930~1990
ARFCN range	0~124 & 975~1023	512~885	512~810	UL:4132~4233 DL:4357~4458	UL:9612~9888 DL:10562~10838	UL9262~9538: DL:9662~9938
Tx/Rx spacing	10MHz	20MHz	20MHz	45MH	190MHz	80MHz
Mod. Bit rate/ Bit Period	270.833kbps 3.692us	270.833kbps 3.692us	270.833kbps 3.692us	3.84Mcps (chip rate)	3.84Mcps (chip rate)	3.84Mcps (chip rate)
Time Slot Period/ Frame Period	576.9us 4.615ms	576.9us 4.615ms	576.9us 4.615ms	Frame length : 10ms Slot length : 0.667ms	Frame length : 10ms Slot length : 0.667ms	Frame length : 10ms Slot length : 0.667ms
Modulation	0.3GMSK	0.3GMSK	0.3GMSK	QPSK HPSK	QPSK HPSK	QPSK HPSK
MS Power	33dBm~5dBm	30dBm~0dBm	30dBm~0dBm	24dBm~-50dBm	24dBm~-50dBm	24dBm~-50dBm
Power Class	4 (max +33dBm)	1 (max +30dBm)	1 (max +30dBm)	3 (max +24dBm)	3 (max +24dBm)	3 (max +24dBm)
Sensitivity	-102dBm	-100dBm	-100dBm	-104.7dBm	-106.7dBm	-103.7dBm
TDMA Mux	8	8	8	-	-	-
Cell Radius	35Km	2Km	2Km	2Km	2Km	2Km

2-2. GSM TX power class

TX Power control level	GSM850 GSM900	TX Power control level	DCS1800	TX Power control level	PCS1900
5	33±2 dBm	0	30±3 dBm	0	30±3 dBm
6	31±2 dBm	1	28±3 dBm	1	28±3 dBm
7	29±2 dBm	2	26±3 dBm	2	26±3 dBm
8	27±2 dBm	3	24±3 dBm	3	24±3 dBm
9	25±2 dBm	4	22±3 dBm	4	22±3 dBm
10	23±2 dBm	5	20±3 dBm	5	20±3 dBm
11	21±2 dBm	6	18±3 dBm	6	18±3 dBm
12	19±2 dBm	7	16±3 dBm	7	16±3 dBm
13	17±2 dBm	8	14±3 dBm	8	14±3 dBm
14	15±2 dBm	9	12±4 dBm	9	12±4 dBm
15	13±2 dBm	10	10±4 dBm	10	10±4 dBm
16	11±3 dBm	11	8±4 dBm	11	8±4 dBm
17	9±3 dBm	12	6±4 dBm	12	6±4 dBm
18	7±3 dBm	13	4±4 dBm	13	4±4 dBm
19	5±3 dBm	14	2±5 dBm	14	2±5 dBm
		15	0±5 dBm	15	0±5 dBm

3. Product Function

Main Function

- HSUPA 5.76Mbps / HSDPA 7.2Mbps / Quad(850/900/1800/1900) , UMTS (900/1900/2100)
- Bluetooth v2.0 + EDR
- Wi-Fi (802.11 b/g)
- USB v2.0 HS compatible
- 8M CMOS (AF, Power LED) + CIF
 - Face Detection, Smile Detection, Eye Blink Detection, Panorama Shot, Mosaic Shot, OCR/BCR
- FM Radio Receiver
- A-GPS, S-GPS, GPS+, Navigation
- DivX Codec
- Accelerometer / Compass
- Instant Messaging capability
- E-mail
- Featured applications provide alarms, calendar, calculator, record audio, converter, timer, stopwatch, and world time.
- File viewer (MS office, PDF)
- Multimedia Message Service (MMS)
- Multimedia capability (with included Media player)
- Photo caller ID
- Speakerphone capability
- WEB/WAP browser (HTMS, XHTML, WML)
- VT H.263 + ARM NB
- Movinand 8GB/16GB +microSD card
- 3.7" AMOLED

4. Array course control

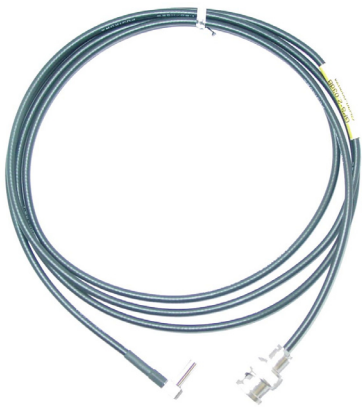
4-1. Software Adjustments



Test Jig (GH99-36900A)



Test Cable (GH39-01160A)



RF Test Cable (GH39-00985A)

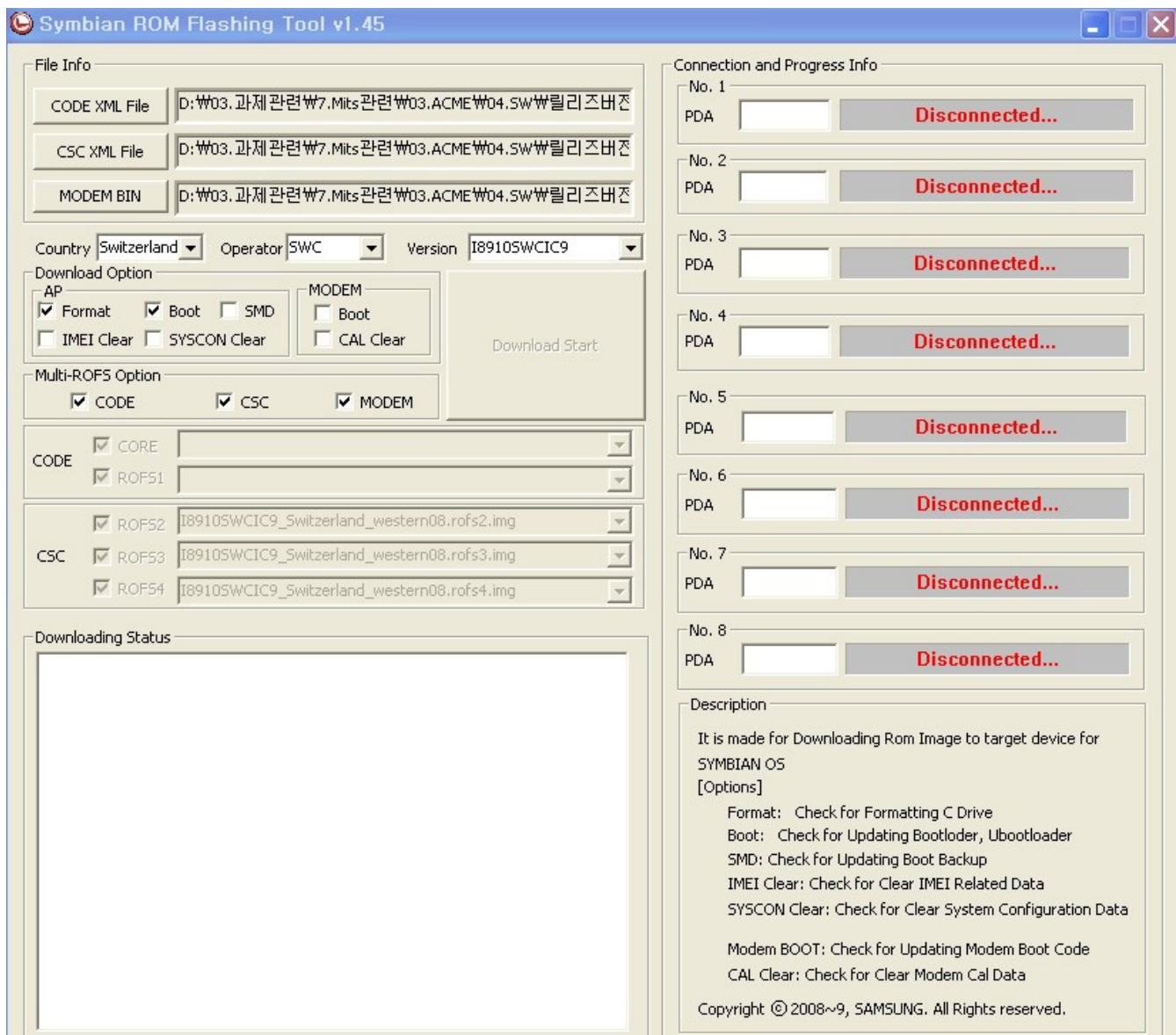


Adapter (GH99-38251A)

4-2. Software Download

4-2-1. Pre-requisite for Download

- i. Symbian ROM Flashing Tool v.1.45 (Or the upper version)
- ii. ACME USB Driver
 - ① PDA : SSDN_V1.1.808.7165_SETUP_whql.exe
 - ② MODEM(BASEBAND) : SAMSUNG Mobile USB DRIVER(4.40.7.0) v1.6.zip
- iii. MS xml parser : Msxml.msi
- iv. USB Cable
- v. I8910 phone with almost fully charged battery(more than 3 battery bars)



4-2-2. Concepts & cautions.

- i. Binary is divided for 2 images, PDA and Modem. PDA image consists of CODE and CSC.
- ii. Do Not power off the phone or disconnect the usb connection during download.
- iii. Use right version of Downloader tool written in Release Note.
- iv. Version of CODE, CSC and Modem(BaseBand) should be matched correctly according to 'Release Note' when you download. If the combination is wrong, phone may not work well.
- v. When you download Modem(BaseBand) binary, after 'Binary Downloading 100%' is displayed in Progress Info box, 'CP Flashing...' message will be displayed. After this message is flashing, 'Download Complete!' message will be shown up.



Detach the phone after this complete message.

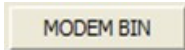
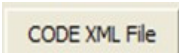

4-2-3. USB Driver installation

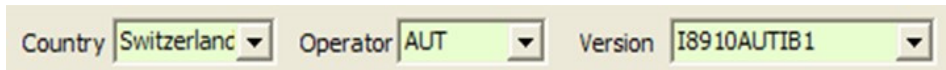
Execute SSDN_V1.1.808.7165_SETUP_whql.exe to setup PDA Driver
Unzip SAMSUNG Mobile USB DRIVER(4.40.7.0) v1.6.zip, setup Mdem Driver with setup.exe

4-2-4 How to Download

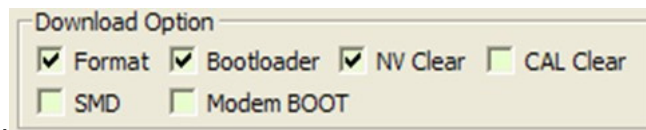
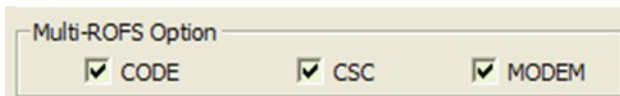
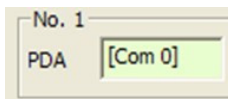
!!! Make sure CODE, CSC, MODEM(BASEBAND) mapping in 'Release Note', and then download with the correct version. After download, press *#1234# and check CODE, CSC and MODEM version. This is very important. !!!


i. CODE + CSC + MODEM(BASEBAND) Download(Full Release)

1. In myProject, download CODE, CSC and MODEM(BaseBand) binary.
2. Launch 'Symbian Rom Flashing Tool', press  button to select MODEM(BASEBAND) binary.
3. Press  button to select CODE xml. (ex:CODE_I8910XXIB5.xml)
4. Press  button to select CSC xml. (ex: CSC_I8910AUTIB5.xml)
5. Confirm CODE and CUSTOM version



6. Power on the phone with **Hold + Side Volume Up Key** pressed (PDA DOWNLOAD mode)
7. When you connect phone to PC with USB, PDA is attached
8. Select the type of binary which you want to download in Multi-ROFS Option box.



9. Set the download option like this.
10. Press  button to start download.

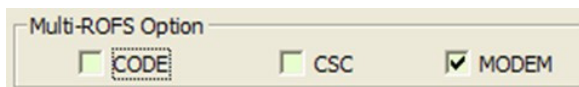
11. After finishing downloading PDA, Modem is downloaded.




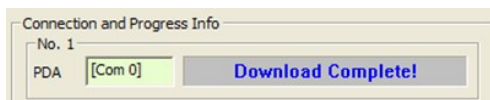
Do Not disconnect a USB cable before 'Download Complete!' message!!

ii. MODEM(BASEBAND) Download Only

1. Proceed from step 'i.-1 to i-2'.
2. Turn on the device with **Hold + Side Up Key pressed** (PDA Download Mode)
3. Do step 'i.-7'.
4. Check only MODEM box.

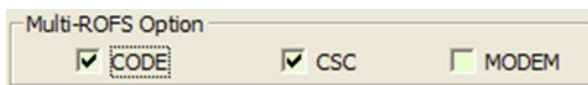



5. Press  button to start download.
6. Wait until this message is displayed!!



iii. CODE + CSC Download Only

1. Unzip CODE and CSC binary.
2. Do step 'i.3~i.7'.
3. Select the type of binary which you want to download in Multi-ROFS Option box.



4. Press  button to start download.
5. Wait until this message is displayed!!

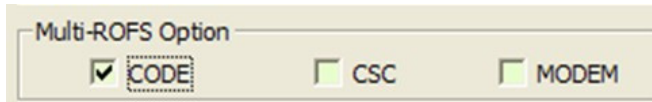


iv. CODE Download Only

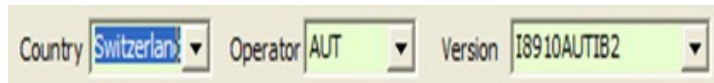
1. Unzip CODE Release.

4-5

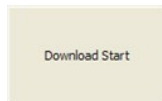
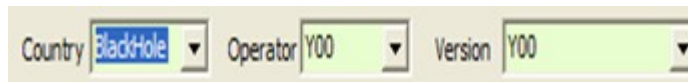
2. Do step'i.-3, i.-6, i.-7'.
3. Select the type of binary which you want to download in Multi-ROFS Option box.



4. Select any Country without Blackhole.(Example of selecting Country)



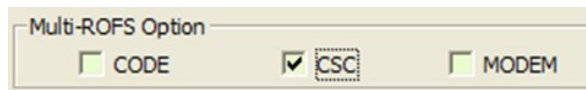
Wrong example of Country(BlackHole)



5. Press button to start download.

v. CSC Download Only

1. Unzip CSC release.
2. Do step 'i.4~i.7'.
3. Select the type of binary which you want to download in Multi-ROFS Option box.



4. Press button to start download.

4-2-5. Troubleshooting

A. If the device is not attached after the Driver installation,

- i. Change USB cable and phone.
- ii. Try with another PC.

B. Download stops in the middle

- i. Close and launch Symbian Rom Flashing Tool again then try again.
- ii. Check the phone is charged enough.

C. Download doesn't start

- i. Check the connection between Symbian Rom Flashing Tool and a phone.
- ii. Select an image again.
- iii. Check mapping of CODE, CSC and Modem is right.(See Mapping Table)
- iv. Check Symbian Rom Flashing Tool version matches with the image.
- v. Check Bootloader version displayed on the phone screen. Start right steps according to the version.

D. Phone doesn't boot up after downloading

- i. Check CODE, CSC and Modem version.

10. Reference data

Reference Abbreviate

- **AAC**: Advanced Audio Coding.
- **AVC** : Advanced Video Coding.
- **BER** : Bit Error Rate
- **BPSK**: Binary Phase Shift Keying
- **CA** : Conditional Access
- **CDM** : Code Division Multiplexing
- **C/I** : Carrier to Interference
- **DMB** : Digital Multimedia Broadcasting
- **EN** : European Standard
- **ES** : Elementary Stream
- **ETSI**: European Telecommunications Standards Institute
- **MPEG**: Moving Picture Experts Group
- **PN** : Pseudo-random Noise
- **PS** : Pilot Symbol
- **QPSK**: Quadrature Phase Shift Keying
- **RS** : Reed-Solomon
- **SI** : Service Information
- **TDM** : Time Division Multiplexing
- **TS** : Transport Stream

1. Safety Precautions

1-1. Repair Precaution

- Repair in Shield Box, during detailed tuning.
Take specially care of tuning or test, because the specification of cellular phone is sensitive for surrounding interference(RF noise).
- Be careful to use a kind of magnetic object or tool, because performance of parts is damaged by the influence of magnetic force.
- Surely use a standard screwdriver when you disassemble this product, otherwise screw will be worn away.
- Use a thicken twisted wire when you measure level.
A thicken twisted wire has low resistance, therefore error of measurement is few.
- Repair after separate Test Pack and Set because for short danger (for example an overcurrent and furious flames of parts etc) when you repair board in condition of connecting Test Pack and tuning on.
- Take specially care of soldering, because Land of PCB is small and weak in heat.
- Surely tune on/off while using AC power plug, because a repair of battery charger is dangerous when tuning ON/OFF PBA and Connector after disassembling charger.
- Don't use as you pleases after change other material than replacement registered on SEC System.
Otherwise engineer in charge isn't charged with problem that you don't keep this rules.

1-2. ESD(Electrostatically Sensitive Devices) Precaution

Several semiconductor may be damaged easily by static electricity. Such parts are called by ESD (Electrostatically Sensitive Devices), for example IC,BGA chip etc. Read Precaution below.

You can prevent from ESD damage by static electricity.

- Remove static electricity remained your body before you touch semiconductor or parts with semiconductor. There are ways that you touch an earthed place or wear static electricity prevention string on wrist.
- Use earthed soldering steel when you connect or disconnect ESD.
- Use soldering removing tool to break static electricity. , otherwise ESD will be damaged by static electricity.
- Don't unpack until you set up ESD on product. Because most of ESD are packed by box and aluminum plate to have conductive power,they are prevented from static electricity.
- You must maintain electric contact between ESD and place due to be set up until ESD is connected completely to the proper place or a circuit board.