

# ES2560BP35

# Operational Manual

Please refer to this manual before operating equipment.

Keep this manual with the equipment.



## Caution

Information on this manual is subject to change without notice.

SSEC( Sungsan E&C), in relation to this document, including the suitability of the implied warranty with the possibility of sales for the specific purpose, we do not have any kind of guarantee.

SSEC does not guarantee follows; Errors that are included in the guide, to provide the instruction manual, run, or not responsible for incidental or consequential damages related to the use

## Safety Caution

The following safety instructions are applied to throughout this whole document. Before operating this equipment, please understand the meaning and the following symbols.

### Caution



Caution means danger. If you're not fully understood this manual, you can damage the equipment. Please take care not to damage the equipment by understanding this manual thoroughly.

Do not go to next step until you fully understand process and directions.

### Warning



This equipment is kind of first safety ground product (if protective earth contained in the power cord is provided). You have to insert the line power plug only to the outlet provided with protective earth contact. If the product inside and outside of the protective conductor is damaged, the product will be in danger. It should not be deliberately damaged the protective conductor.

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## Chapter 1. Summary

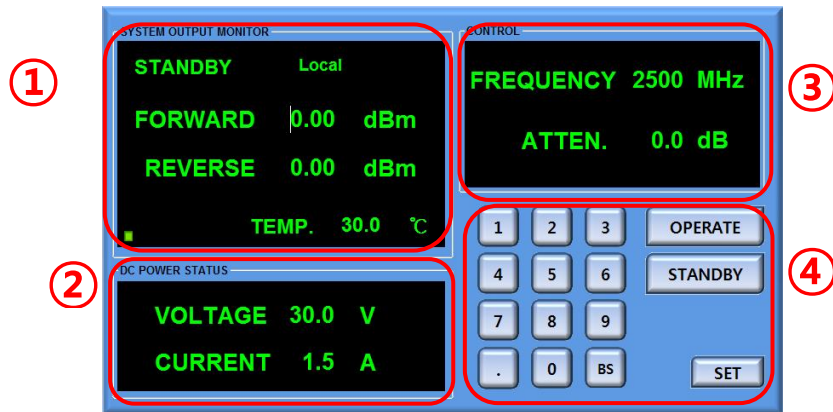
The Amplifier of ES2560BP35 is a high-output amplifier that ensures the 35W rated power in the 2500~6000MHz. You can see the system information by using the touch screen LCD on the front panel in Local mode, and also it is possible to set the gain adjustment of the operating frequency, in addition by using the GPIB communication, you can remotely control the same function in remote mode.

The main specifications of this system are as follows.

### 1) main specifications

- ▶ Operating Frequency: 2500~6000MHz
- ▶ Output Power: 35W (45.4dBm)@Psat
- ▶ Input: 0dBm (Max. input +10dBm)
- ▶ Frequency Flatness :  $\pm 1.5\text{dB}(\pm 2.0\text{dB Max.})$
- ▶ Gain adjustment range: 15dB typ.
- ▶ Cooling System: Forced air flow system
- ▶ Operating Temperature: 0~50°C
- ▶ RF In/out PORT: N type Female RF
- ▶ Sampling PORT: SMA Female ( $10\pm 1\text{dBm}$  @ 45dBm Pout)

## Chapter 2. LCD Panel



[Picture.1] Main Screen

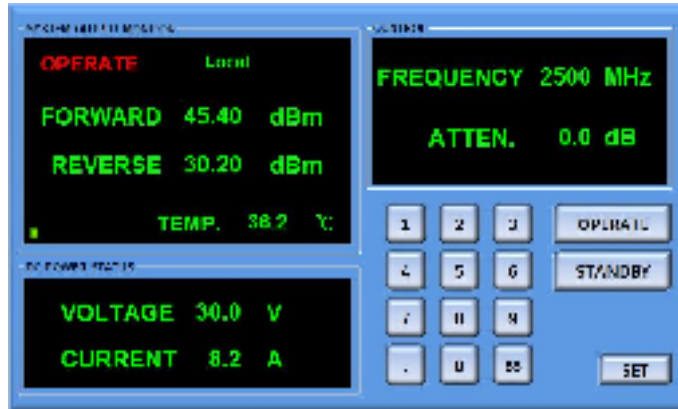
### 1) Main Screen

After applying power to the Amplifier, and press the front switch, Windows7 will be activated which is the operating system of the LCD panel, and then the main screen is displayed as shown in the Picture 1.

### 2) Main screen Layout

#### ① System output display

It displays the operating status and the output power and operation temperature and the Local / Remote operation state of AMP.



[Picture 2.] Output power display / Amp on mode

② Power status display

It displays the voltage / current of the DC power to be applied to the internal module.

③ Control state display

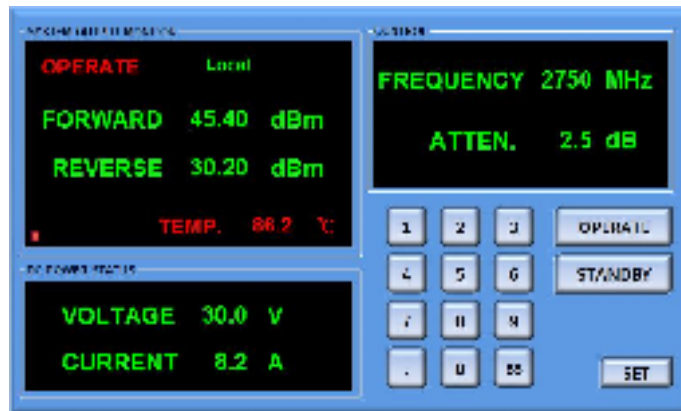
The system is adapted to be able to set the Attenuation Value for the operating frequency and gain adjustment, will display the current setting value to the control state display unit.

④ Numeric keypad / control button

The numeric keypad and AMP to set the operating frequency and Attenuation value consists of the button for ON / OFF.

3) Alarm Display

The system output display section and the power status display section of the system, if an alarm occurs, displays the issue as a red text, enables the user to take correct action. For each alarm conditions and methods, please refer to Chapter 4.



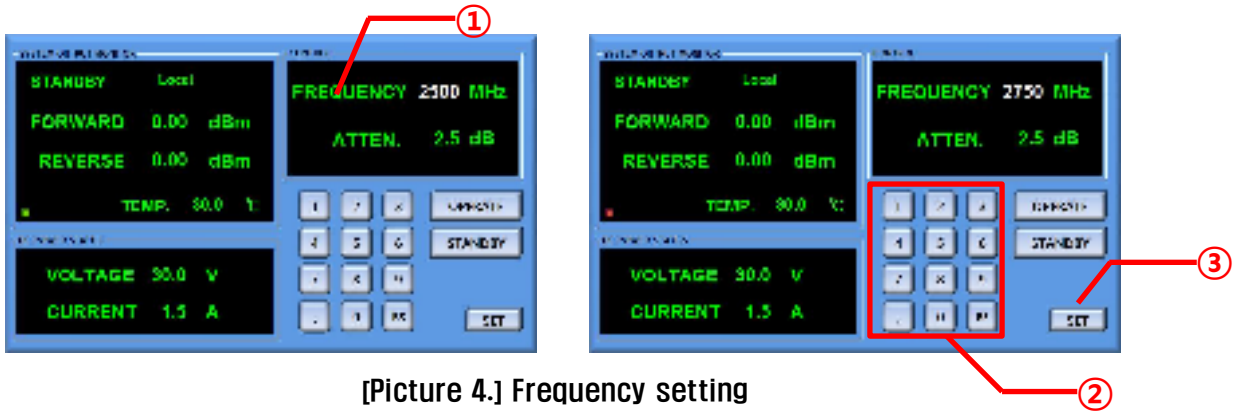
[Picture 3.] Alarm / Over Output power

#### 4) Frequency setting

This system guarantees a more accurate output power and gain control, by setting the frequency to operate the system. The frequency setting is only available on STANDBY mode.

If the actual frequency of use and the frequency on the LCD panel do not match, the output power level of accuracy is not guaranteed so that please make sure to do frequency setting prior to AMP operation for normal operation. Frequency input range is 2500 MHz~6000 MHz, frequency setting method is as follows.

- ① When you touch the "FREQUENCY" or the number of the control status display section, the numbers of the frequency display will change to white, then it waits for the frequency input of user.
- ② Use the numeric keypad, and enter the frequency in MHz. As mentioned earlier, the setting of the frequency is performed only by STANDBY mode, frequency input range is 2500MHz~6000MHz.
- ③ After completing the frequency input, once you press the frequency input [SET] button the frequency input will be completed, then frequency display section, which was displayed the white will change to green again.



[Picture 4.] Frequency setting



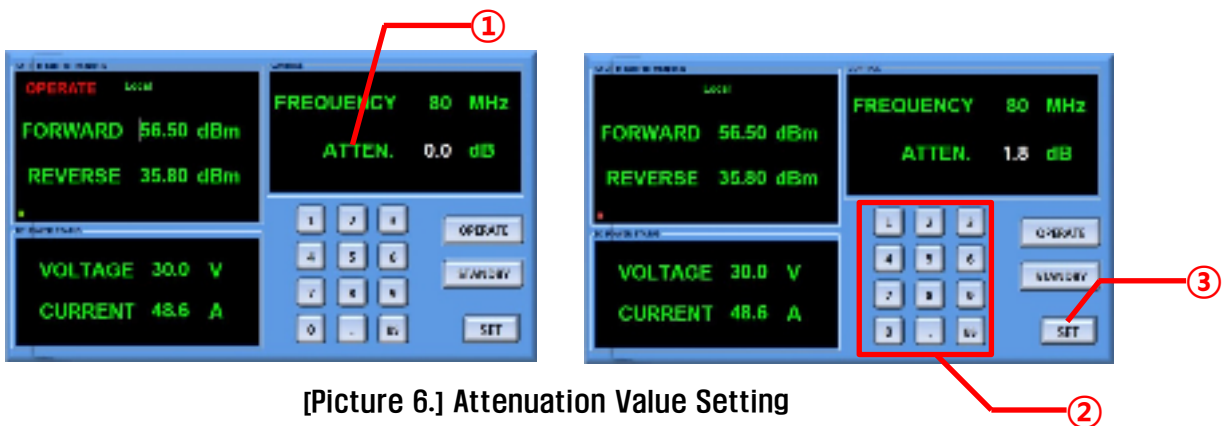
[Picture 5.] Frequency setting complete



## 5) Attenuation Value Setting

This system has built-in output attenuation function and output can be adjusted under the same input conditions. It is adjustable by 0.1dB and total attenuation range is about 23dB. Attenuation range may differ depending on the operating frequency.

- ① If you touch "ATTN" or the attenuation value on the control display, the color of the attenuation value turns into white and a new value can be set.
- ② Set the attenuation value by 0.1dB with the Number pad. The attenuation value can be set in any state, regardless of whether the mode is the STANBY / OPERATE modes.
- ③ And then, press the SET button to complete the setting. The color of attenuation display will change back to green.





[Picture 6.] Attenuation Value Setting




[Picture7.] Attenuation Value Setting Completion

## Chapter 3 . Operation Method

- 1) Install the system in the flat and stable place and connect it to the power.  The side grounding type cable must be used as the connecting cable.
- 2) Make sure that the circuit breaker at the back is off before connecting the power cables and RF cables.  Care should be exercised not to confuse the input and output ports when connecting the RF Cable.
- 3) After turning on the Circuit breaker at the back, the switch at the right bottom of the front LCD panel is pressed.

The LCD program will start after the window program boots.

- 4) Apply the RF input after checking and setting the Operating frequency.  To prevent the AMP from damaging owing to over- input, Please set -10dBm as initial input power.
- 5) Make a final check on connection status of system. By pressing the operate button on the right side of LCD panel, AMP will operate.  
  
Increase the input power slowly so as to reach the rated output. (Usually, it is about 0dBm at rated output, which may vary depending on operating frequency)
- 6) If you want to reduce the output power during operation, it can be changed to the desired level of damping output through the settings.

## Chapter 4 . Alarm Condition

In case of abnormal operating or system failure condition such as the table below, the alarm performs and the system is forced to shut down to prevent damage of internal modules. After the forced shut down, it can be re-operated through the necessary steps that can turn alarm off

Alarm	Generating Condition	Check and Follow
Temperature Alarm	>85°C: Alarm >90°C: Shutdown	Make sure that the FAN is in normal operation. If the fan is faulty, please ask for replacement.
Over- Output Alarm	> 47.5dBm: Alarm > 48dBm: Shutdown	Make sure that the normal input power is applied. Make sure that the frequency is set on the LCD is same with the actual operating frequency.
VSWR Alarm	Shutdown when VSWR > 3 :1	Check the fastening direction of RF input / output cable and status of break / damage.
Current Alarm	Single module current > 15A	In case that internal module is faulty, the current alarm occurs. Please ask for replacement of that module.

## Chapter 5 . GPIB Specification

The remote operation is allowed by connecting the cable to GPIB connector of rear panel. The following describes GPIB Address and Command information related to the GPIB remote operation.

### 1) GPIB Address

GPIB Primary address: 27(Fixed) / Secondary address: None

To change the address, the internal hardware change is required.

### 2) Data format

Send and receive data format is defined in the ASCII character unless otherwise stated.

## 3) Receive completion method

EOS(End Of String) Setting: Use <LF>(₩n, 0x0A) with Termination character

## 4) GPIB Command

GPIB Command	Contents	Responds	Remark
*IDN?	Product information request	Manufacturer, Model name, SN<X>, SW REV<X.X>	Sungsan Electronics & Communications, SSA505, SN1 SW REV1.1
S	STANDBY	No response	system operation standby
O	OPERATE	No response	system operation
FPOW?	Forward Power Request	FPOW=<XX.XX>dBm	Output 44dBm → FPOW=44.00dBm
RPOW?	Reflect Power Request	RPOW=<XX.XX>dBm	Output 32.16dBm → RPOW=32.16dBm
FXXXX	Frequency-Setting Request	F<XXXX>	Frequency indicated in MHz Setting range: 2500~6000
F?	Current Frequency-Setting check		
Axxx	Attenuation value setting Request	A<XXX>	Attenuation vale range: 0~230 Multiply Actual Attenuation value by 10 ex) 12.5dB → A125
A?	Current Attenuation value setting		