In order to keep the Protek 7830 Spectrum Analyzer continuously updated, information in this manual is subject to change without notice. Please contact us, if you have any questions about version upgrade and amendment.

GS Instruments Co., Ltd.
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Safety Symbols

**Danger Symbol**

Danger symbol identifies conditions or practices that could result in injury or loss of life.

**Caution Symbol**

Caution symbol identifies conditions or practices that could result in damage or fire.

**Ground Symbol**

Ground symbol identifies conditions or practices that need grounding.
Safety Instruction

- **No Unauthorized Disassembling**

  Do not remove the instrument cover. Only GS Instruments’ Service technicians are allowed to repair the instrument. Instruments that appear damaged or defective should be secured against unintended operations until they are repaired by qualified service technicians. Also, unauthorized disassembling makes the warranty void.

- **Keep the power connectors clean**

  Instrument’s power connectors should remain dust free. Clean the power connectors regularly. Dust could result in damage to this instrument. Also, continually cleaning the dust on the input terminal of RF frequency counter. Clean the input terminal regularly. Dust could result in damage to the instrument.

- **RF in/output rating**

  Rating of RF input and output connector
  Maximum DC voltage rating
  RF input connector (socket): N type female, 50Ohms
  Maximum RF input power: 5Vrms
  Caution: Do not use over 5Vrms supplied and/or (-) power could result in damage to this instrument

  Do not operate this instrument if there is any doubt it is functioning properly: if operating personnel feel the instrument is not operating properly, return this instrument to GS Instrument for service and repair to ensure the safety features are maintained.
• **DC Power**

The operating personnel must use the DC adaptor included in the package. Other unauthorized adaptors could result in damage to this instrument and it is out of warranty. The DC connector tip must attach with (+) polar grounding.

The operating personnel must use grounded power to operate this instrument.

• **Safekeeping Place**

Do not attempt to operate this instrument for long durations and avoid restoring this instrument in the following conditions.

* Avoid direct sun lights
* Keep away heating systems
* Avoid high temperature (Ex. Inside of the car during the summer time)
* Keep away from liquids
* Avoid high moisture and/or poor ventilation
* Keep away from dust and/or smoke
* Avoid extremely low temperature

• **Battery**

Protek 7830 Ni-MH battery is rechargeable. Battery is recharged based on the battery temperature. Charging is controlled from the power of the battery cell and the temperature of the battery. The Ni-MH Rechargeable battery is going to increase temperature slowly until the temperature is extremely higher. Battery charging is finished automatically by checking the degree of the temperature (dT/dt). For battery protection, when the power of Battery cell is increased, comparing regular temperature and/or exterior temperature degree of when the temperature increases over 50 degrees, battery charging will be finished automatically.
Operating personnel must use Ni-MH Rechargeable Battery and do not operate near explosives
- The battery usage time can change due to the using period, environment and temperature.
- As time goes by, the battery-running time will decrease and eventually need to replace. Operating personnel should phase in a new battery when the battery-running time is less than half hour (The warranty period is 6 month, after instrument use has begun.)
- Operating personnel should not use this instrument and/or keep the battery in place for long periods of time, which could result in discharging of the battery.
- To avoid damages to battery, when battery is low, this instrument will turn off automatically.
Limited Warranty. GS Instrument product is warranted against defects in material and workmanship for a period of one year from the date of shipment. During the warranty period, GS Instrument Company will, at its option, either repair or replace products that have been proven to be defective by GS Instruments.

Below is the limitation of warranty per this manual:

- Buyer misuse, unauthorized modification or repair of product
- Operating personnel use this instrument against specification.
- Defect resulting from improper or inadequate maintenance by buyers.
- Defect is caused by the environment such as fire, flood or earthquake.
- Buyer installs substitute parts or performs any unauthorized circuit and/or consumption good substitution.
- Buyer operates instrument against the environmental specifications for this instrument.

With the exception of the above articles, GS Instruments product is warranted for an initial purchaser.

If this instrument is resold to the other end-users, warranty is not transferred.

The foregoing warranty shall not apply to defects resulting from outside the environment and/or misuse.
Accessories

- Carrying case
- AC Adaptor
- Carrying Strap
- Coaxial Cable
- RS-232 Cable
- Power Cable
- Earphones
- N-BNC Adaptor
- Ni-MH (Rechargeable Battery) 6PCS
- User’s Manual X 2PCS
- GUI Software CD
- Antenna

※ Standard Option
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Overview

The Protek 7830 is a handheld spectrum analyzer and it is optimized to analyze signals for the radio frequency equipment. The Protek 7830 has adopted a synthesizer method and has a wideband reception range of 100 kHz to 2,900 MHz. The characteristics of frequency response of the Protek 7830 is that the measuring data are corrected by memorized calculation data, and so it enables Protek 7830 to measure accurate levels and make it possible to analyze easily for a wide range of frequency bands.

The Protek 7830 provides various functions and user-friendly interfaces which make it easy for the users to check the location of the antenna with simple handling. The Spectrum Analyzer is ideal for users to test, install and maintain mobile telecommunications systems, cellular and cordless phones, CB paging, paging systems, Cable and Satellite TV Systems as well as antenna site measurements and maintenance. The Protek 7830 supports the RS 232C serial communication and has separate GUI software. Users can control the Protek 7830 easily after connecting the Protek 7830 with their personal computer, and can utilize the analyzed data variously after converting or saving numerical values or graphs.
## Main Features

- 100 kHz to 2,900 MHz measurement range
- Frequency Spectrum Analyzing Function and Frequency Counter Function
- Measures and demodulates N-FM, W-FM, AM, SSB signals
- Built-in Frequency Counter
- Accurate Signal Level Measurement
- Marker/delta Marker/Squelch Adjustment Function
- Peak Search/Marker to Center Function
- Channel Power Measurement Function
- PLL tuning system for precise frequency tuning
- Built-in Speaker
- 192 Pixels X 192 Pixels Back Light LCD
- Menu selection method for Function selection
- RS-232C Interface
- User-friendly Icon Display
- Maintenance of Wireless Telecommunications Equipments
- General Usage for Installation and Maintenance of telecommunications Equipments
- Installation and Maintenance of Cable
- RFID Tag RF Strength Measurement
- Jammer (for hospital, theater and military) Performance Test
- Installation and Maintenance of Satellite Antenna
- Detection of Tapping and Hidden Camera
Functions

Spectrum Analyzer

- Spectrum: Peak Search, Marker to Center, Channel Power Function
- Internal Attn.: The input range can be extended by internal
- Max 35 dB Attn. function.
- Sweep Mode: Single Run, Free Run, Squelch Run Selectable
- Squelch Function: The Squelch Level may be adjusted to any value from the reference level to Full Scale.
- Copy Function: The Copy Set mode allows the contents of the Channels edit Setup and Data memories to be copied to an external device. Data may also be written into these memories from external device.

Frequency Counter

- Frequency range: 35 MHz to 2,900 MHz
- No. of digits: 7 digits
- Resolution: 1 kHz
# Specifications

<table>
<thead>
<tr>
<th>Frequency Range</th>
<th>100 kHz to 2,900 MHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resolution</td>
<td>Min. 6.25 kHz</td>
</tr>
<tr>
<td>Accuracy</td>
<td>TXO : ± 3 PPM / Display : ± 1.5 PPM</td>
</tr>
<tr>
<td>W-FM / N-FM / AM / SSB</td>
<td></td>
</tr>
<tr>
<td>Wide FM : Approx. 180 kHz @-6 dB</td>
<td></td>
</tr>
<tr>
<td>Narrow FM : Approx. 12.5 kHz @-6 dB</td>
<td></td>
</tr>
<tr>
<td>AM/SSB : Approx. 2.4 kHz @-6 dB</td>
<td></td>
</tr>
<tr>
<td>Step Range</td>
<td>AM, SSB, Narrow FM : 6.25kHz, 12.5kHz</td>
</tr>
<tr>
<td></td>
<td>Wide FM : 6.25~125kHz (Multiple of 6.25 kHz)</td>
</tr>
<tr>
<td></td>
<td>125~2500kHz (Multiple of 125 kHz)</td>
</tr>
<tr>
<td>Span Range</td>
<td>AM, SSB, Narrow FM : 1MHz, 2MHz</td>
</tr>
<tr>
<td></td>
<td>Wide FM : 1~20MHz (Multiple of 1 MHz)</td>
</tr>
<tr>
<td></td>
<td>20~400MHz (Multiple of 20 MHz)</td>
</tr>
<tr>
<td>Frequency Selection Mode</td>
<td>Center, Start/ Stop, Span</td>
</tr>
</tbody>
</table>

| Measurement Range | -20 dBm to -110 dBm |
| Average noise Level |  |
|                   | Wide FM : -100 dBm Max. |
|                   | Narrow FM : -110 dBm Max. |
|                   | AM/SSB : -100 dBm Max. |
| Amplitude Units   | dBm, dBmV, dBuV |
| Reference Level Accuracy |  |
|                   | Typical ± 1.5 dB (@20~30°C/W-FM) |
|                   | Typical ± 1.5 dB (@25°C/N-FM/AM/SSB) |
| Reference Level Range | -80 dBm to 0 dBm |
| Log Scale         | 0.2 dB/DIV min, in 0.25 dB Span (5 Display Division) |
| Internal Attn     | 10 dB, 20 dB, 30 dB, 35 dB Max. |
| Internal Attn Accuracy | ± 1.0 dB (@25 °C) |
### Specifications

<table>
<thead>
<tr>
<th><strong>Sweep</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Speed</strong></td>
<td>Min. 500 msec</td>
</tr>
<tr>
<td><strong>Trigger Source</strong></td>
<td>Narrow FM / Wide FM / AM / SSB</td>
</tr>
<tr>
<td><strong>Trigger Mode</strong></td>
<td>Free Run / Single Run / Continuous Wave / Squelch Run</td>
</tr>
<tr>
<td><strong>Trigger Level</strong></td>
<td>TTL Level</td>
</tr>
<tr>
<td><strong>Marker Mode</strong></td>
<td>Maker / Delta Maker / Peak Search / Marker to Center / Channel Power</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Memory</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Trace &amp; Setup Storage</strong></td>
<td>Max 100 Waveforms and 100 States</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Display</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type</strong></td>
<td>Mono STN LCD</td>
</tr>
<tr>
<td><strong>Display Resolution</strong></td>
<td>192 Pixels X 192 Pixels</td>
</tr>
<tr>
<td><strong>LCD Light</strong></td>
<td>On / Off</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Frequency Counter</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Frequency Range</strong></td>
<td>35 MHz to 2,900 MHz</td>
</tr>
<tr>
<td><strong>Resolution</strong></td>
<td>7 Digits</td>
</tr>
<tr>
<td><strong>Accuracy</strong></td>
<td>±50 PPM ±1 COUNT</td>
</tr>
<tr>
<td><strong>Sampling Time</strong></td>
<td>1 sec</td>
</tr>
<tr>
<td><strong>Input Sensitivity</strong></td>
<td>9 MHz to 2,000 MHz : 150 mVrms</td>
</tr>
<tr>
<td></td>
<td>20 MHz to 1,000 MHz : 100 mVrms</td>
</tr>
<tr>
<td></td>
<td>2,000 MHz to 2,900 MHz : 400 mVrms</td>
</tr>
<tr>
<td><strong>Input Impedance</strong></td>
<td>50 Ohms</td>
</tr>
<tr>
<td><strong>Max. Input Voltage</strong></td>
<td>5 Vrms Max.</td>
</tr>
</tbody>
</table>
## Specifications

### Spectrum input Port

<table>
<thead>
<tr>
<th>RF Input Connector</th>
<th>N type Female, 50 Ohms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max Input Level</td>
<td>Max. +10 dBm, 5Vrms</td>
</tr>
</tbody>
</table>

### Operation Environment

<table>
<thead>
<tr>
<th>Operating Temperature</th>
<th>0 ℃ to 40 ℃</th>
</tr>
</thead>
<tbody>
<tr>
<td>Humidity</td>
<td>35 RH to 85 RH</td>
</tr>
<tr>
<td>Storage Temp.</td>
<td>10 ℃ to 50 ℃</td>
</tr>
</tbody>
</table>

### Power Source

<table>
<thead>
<tr>
<th>Battery Power Source</th>
<th>AA Type Ni-MH Rechargeable Battery × 6 PCS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Battery Specification</td>
<td>AA Type 1.2 V, 2,700 mAh Rechargeable Nickel Metal Hydride Battery</td>
</tr>
<tr>
<td>Adapter</td>
<td>SMPS Type AC Adapter (DC 12 V Output)</td>
</tr>
<tr>
<td></td>
<td>Car-Adapter (DC 12 V Output)</td>
</tr>
<tr>
<td>Auto Power On/Off</td>
<td>Off/ 5 min./ 10 min./ 20 min./30 min.</td>
</tr>
</tbody>
</table>

The Protek 7830 can be quickly recharged using a Ni-MH rechargeable battery. For safe usage, it is strongly recommended to use Ni-MH Rechargeable battery, and please do not use in the place with high temperature or high humidity during recharging.
### Specifications

<table>
<thead>
<tr>
<th>Physical Specifications</th>
<th>Weight</th>
<th>Approx. 0.70 Kg (1.54 lbm) (including Antenna, except Battery)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Dimension</th>
<th>4.4&quot; (W) × 10&quot; (H) × 2.3&quot; (D)</th>
</tr>
</thead>
</table>

#### Standard Accessories
- Antenna (Receive Only), SMPS Type AC Adapter, Fuji-AA type Ni-MH Rechargeable Battery (6 PCS, 1.2 V 2,700 mAh), Manual, Coaxial Cable, Earphones, Carrying Case, Carrying Belt, RS-232C Cable, Adapter (N-BNC), Software for PC Application

#### Optional Accessories
- Matching Pad (75 Ohms to 50 Ohms), F-BNC Adapter, Car Adapter, Block Voltage Unit
The LCD screen can display the signal input level, frequency and amplitude values, and system data.

- **Power Key**
  Key to turn ON/OFF of the system

- **Run / Mode / Sweep / Marker Key**

- **Run**
  Key to run the Scanning or input the GHz unit for frequency value input
Front Panel

- **Mode**
  Key to set up the Reception Mode or input the MHz unit for frequency value input

- **Sweep**
  Key to set up the Sweep Mode or input the kHz unit for frequency value input

- **Marker**
  Key to select the Marker Function:
  Marker, Delta Marker, Squelch Marker, Peak Search, Marker to Center, and Channel Power

- **Numeric Key**
  Key to input the frequency value

- **Menu Key**
  Key to set up the required functions of the system

- **Up/Down Key**
  Key to select the main menu items or frequency values

- **Knob Key**
  The function of Knob is same as the Up/Down keys
Rear Panel

- **Belt Clip**
  Users can yoke the Protek 7830 on a belt.

- **Speaker**
  Users can use the speaker to output the modulated audio from RF signal level.

- **Reset Key**
  Users can use this Reset key from system’s malfunction or memory reset.

- **Battery**
  Note the polarity of batteries at inserted battery compartment. And users must use the AA type Ni-MH rechargeable batteries for battery charging.
DC Input Jack
Users can use this DC input jack for power supply and battery charging with SMPS type AC/DC Adapter or Car Adapter.

RS-232C Connector (8 pin mini DIN connector)
Users can use the RS-232C connector for PC communications with a serial cable.
Top Panel

- **Input Connector for Signal Level**
  Users can connect the antenna or coaxial cable to this connector on the system. The maximum input voltage is 5 Vrms.

- **Input Connector for Frequency Counter**
  Users can connect the signal source to this connector as an input. The maximum input voltage is 5 Vrms.

- **Volume Control**
  Users can control the volume of audio outputs. To increase the volume of audio output, turn the volume control to the clockwise direction.

- **Earphones Jack**
Before Power ON

For insertion of batteries, please release the screw on the battery cover on the bottom of the instrument. And put AA Type Ni-MH rechargeable batteries (Total 6 PCS) in.

To charge the batteries after inserting batteries, connect the DC cable plug of SMPS type adaptor to DC jack of the system (DC output: 12V). Battery charging will begin after DC cable is connected.

At this time, if users turn on the power of the system, the battery icon on the display window is displayed and blinking. And if the charging of batteries is finished, the blanking of battery icon will stop and only be displayed.

To measure the input level of RF signal, connect the antenna or coaxial cable to the N-type connector of the system (marked ANT).

- **Input Connector for RF Signal Level:**
  Users can connect the antenna or coaxial cable to this connector on the system. The maximum input voltage is 5 Vrms.

- **Input Connector for Frequency Counter:**
  Users can connect the signal source to this connector as an input. The maximum input voltage is 5 Vrms.
**Power ON**

To turn on the system power, Press the \( \text{Power} \) key. When the system power is ON, the last displayed screen from the previous usage will be displayed (Previous setup status).

This system supports shortcuts with the combination of keys. To use this shortcut function, press the \( \text{Shift} \) key and press the numerical key. The frequently used function description is marked on the numerical key below. The upper right icons are the basic \( \text{1830} \) mode and the \( \text{SHIFT} \) mode. Users can select the shift mode or basic \( \text{1830} \) mode by pressing the \( \text{Shift} \) key.

For the LCD display, refer to below figure.
Turn on power of instrument

**STEP 1**

- Push the **Power** Key.

**STEP 2** (Adjust to LCD Contrast)

- Push the **Shift** Key.
- Push the **LCD CONTRAST (No.8)** 8 Key.
- Adjust to desired **LCD Contrast** using the **Up/Down** Keys or **Knob** Key.

**STEP 3**

- Push the **Dot** Key to be taken out of Menu.

**STEP 4** (LCD Light On/Off)

- Push the **Shift** Key

**STEP 5**

- Push the **No. 7 (LCD Light)** 7 Key
Description of operating screen

1. ICON window
2. Frequency Input window
3. Wavy pattern window
4. Squelch window
5. Marker window
### Description of operating screen

<table>
<thead>
<tr>
<th>(a)</th>
<th><strong>Shift State Indication</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Normal state" /> <img src="image2" alt="Shift Input state" /></td>
<td>Normal state  <img src="image3" alt="Shift" /> Shift State Indication  Pushing the shift key changes the icon.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>(b)</th>
<th><strong>Reception Mode State Indication</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image4" alt="Wide Frequency Demodulation Mode" /> <img src="image5" alt="Narrow Frequency Demodulation Mode" /> <img src="image6" alt="Amplitude Modulation Mode" /> <img src="image7" alt="Single side band Demodulation Mode" /></td>
<td>Wide Frequency Demodulation Mode  Narrow Frequency Demodulation Mode  Amplitude Modulation Mode  Single side band Demodulation Mode  Pushing the mode key changes the icon.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>(c)</th>
<th><strong>Sweep Mode State Indication</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image8" alt="Free Run" /> <img src="image9" alt="Squelch Run" /> <img src="image10" alt="Single Run" /></td>
<td>Free Run  Squelch Run  Single Run  Pushing the sweep key changes the icon.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>(d)</th>
<th><strong>Run-Scanning Run/Stop State Indication</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image11" alt="Running" /> <img src="image12" alt="Stop" /></td>
<td>Running  Stop  Pushing the run key changes the icon.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>(e)</th>
<th><strong>Marker State Indication</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image13" alt="Center Marker State" /> <img src="image14" alt="Marker 1 State" /> <img src="image15" alt="Delta Marker State" /> <img src="image16" alt="Squelch Marker State" /></td>
<td>Center Marker State  Marker 1 State  Delta Marker State Marker 1, 2  Squelch Marker State  Pushing the marker key changes the icon.</td>
</tr>
</tbody>
</table>
Description of operating screen

1. Buzzer On/off Indication
   - Buzzer Off
   - Buzzer On
   Icons are changed by Dot(Buzzer) key

2. Battery Residual Indication
   - Full
   - Empty

2. Frequency Input window

- CENT
- MKR1
- MKR2
- FCNT
- CHPW

- LEVEL
- ATTN

- LEVEL
- ATTN

- ATTN

- ATTN

- ATTN

- ATTN
Description of operating screen

ⓐ Center Frequency Indication

ⓑ Maker 1 Frequency Indication

ⓒ Maker 2 Frequency Indication

ⓓ Frequency Counter Value Indication

ⓔ Channel Power Value Indication

- Indication of Frequency Value of each Mode

ⓑ Level Value Indication

- Indication of Level Value of each Mode.

ⓒ Level Unit

- Can be selectable in the main menu.
  [Please refer to Menu Level Unit establishment for further details]

ⓓ Atten. Establish Value

- Indicate established Attenuation Value.
  [Please refer to Menu Level Unit establishment for further details]

ⓔ Frequency Unit

- Every Frequency Unit is indicated in MHz
Description of operating screen

3. Wavy pattern window

<table>
<thead>
<tr>
<th>Indication Reference Value of Screen Level Value</th>
<th>Indication to Vertical Level Value of Wavy pattern window. [Please refer to screen level establishment in basic operations for further details]</th>
</tr>
</thead>
</table>

Marker Indication

<table>
<thead>
<tr>
<th>Center Marker</th>
<th>Every Marker can be controlled by the Up/Down keys or Knob Key.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marker 1</td>
<td></td>
</tr>
<tr>
<td>Marker 2</td>
<td></td>
</tr>
</tbody>
</table>
### Description of operating screen

#### 4. Marker Window

![Operating Screen]

<table>
<thead>
<tr>
<th>CENT</th>
<th>Center Frequency</th>
<th>MHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPAN</td>
<td>Span Frequency</td>
<td></td>
</tr>
<tr>
<td>STEP</td>
<td>Step Frequency</td>
<td></td>
</tr>
</tbody>
</table>

#### ② Center Marker, Marker 1, When Squelch Marker

<table>
<thead>
<tr>
<th>CENT</th>
<th>Center Frequency</th>
<th>MHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPAN</td>
<td>Span Frequency</td>
<td></td>
</tr>
<tr>
<td>STEP</td>
<td>Step Frequency</td>
<td></td>
</tr>
</tbody>
</table>

#### ⑥ When Delta Marker

<table>
<thead>
<tr>
<th>MKR1</th>
<th>Marker 1 Frequency</th>
<th>MHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>LEV1</td>
<td>Marker 2 Level Value</td>
<td>dBm</td>
</tr>
<tr>
<td>DIFF</td>
<td>Marker1- Marker2 Level Value</td>
<td></td>
</tr>
</tbody>
</table>

#### ⑥ When Measuring Channel Power

<table>
<thead>
<tr>
<th>CENT</th>
<th>Center Frequency</th>
<th>MHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPAN</td>
<td>Span Frequency</td>
<td></td>
</tr>
<tr>
<td>CHBW</td>
<td>Channel Bandwidth</td>
<td>MHz</td>
</tr>
</tbody>
</table>
Reception Mode

Reception Mode has total (4) four modes for demodulation when receiving.

<table>
<thead>
<tr>
<th>Mode</th>
<th>Description</th>
<th>RBW (Resolution Bandwidth)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wide-FM</td>
<td>Wide Frequency Modulation</td>
<td>180 kHz</td>
</tr>
<tr>
<td>Narrow-FM</td>
<td>Narrow Frequency Modulation</td>
<td>12.5 kHz</td>
</tr>
<tr>
<td>AM</td>
<td>Amplitude Modulation</td>
<td>2.4 kHz</td>
</tr>
<tr>
<td>SSB</td>
<td>Single Side Band Modulation</td>
<td>2.4 kHz</td>
</tr>
</tbody>
</table>

The Wide FM mode is ordinary used to interpret a large signal of bandwidth; the Narrow FM mode is used to interpret a narrow Bandwidth Signal. AM and SSB can be used irrespective of Bandwidth.

Push Mode (MHz) Key to establish the reception mode and then the top-left ICON will be changed to WFM, NFM, AM, SSB in order. When inputting frequency like Start/Stop, Span etc, The Mode (MHz) Key is used.

RBW is fixed in each Mode as follows.

Wide FM RBW (Resolution Bandwidth) 180 kHz
Narrow RBW (Resolution Bandwidth) 12.5 kHz
SSB/AM RBW (Resolution Bandwidth) 2.4 kHz

**STEP 1**
- Push the Mode (MHz) Key.

**STEP 2**
- Push the Mode (MHz) Key and the top left ICON will change to WFM, NFM, AM, and SSB order.
Sweep Mode

The Sweep mode is used to interpret the characteristics of input signals. Every each characteristics of the sweep mode is as follow.

<table>
<thead>
<tr>
<th>Mode</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>[F] Free Run</td>
<td>Analyzing execution consecutively</td>
</tr>
<tr>
<td>[1] Single Run</td>
<td>Only 1 time Execution</td>
</tr>
<tr>
<td>[5] Squelch Run</td>
<td>Run by higher than Squelch level (Similar Trigger Mode of Oscilloscope)</td>
</tr>
</tbody>
</table>

Establish this mode by pushing the Sweep (kHz) [Sweep kHz] Key and then the top left ICON will be changed to FREE Run [F], SQUELCH Run [5] and SINGLE Run [1] in order. The Sweep (kHz) [Sweep kHz] Key is used as input Start/Stop, Span and Input Frequency Unit into kHz Unit.

After frequency is inputted, [F] FREE Run continues to execute Run-Scanning operation automatically.

[5] Squelch Run operation will stop Run-Scanning in case of the signal level value is getting higher than the squelch level value. But, If the signal level is getting lower than the squelch level, restart to Run-Scanning.

After input is finished Start/Stop Frequency, [1] Single Run execute Run-Scanning just a once. In addition, if it is desired to Run-Scanning, push the Run (GHz) [Run GHz] Key and then execute Run-Scanning once

STEP 1

- Push the **Sweep (kHz)** [Sweep kHz] Key

STEP 2

- Push the **Sweep (kHz)** [Sweep kHz] Key, and the top-left ICON will be changed to [F] FREE Run, [5] SQUELCH Run and [1] SINGLE Run order.
Set up Span

Setting of step for Span means Frequency Resolution and Span can be adjusted from 1MHz to 400MHz. And the step at Narrow FM, SSB and AM can be set 1MHz to 2MHz. Wide FM from 1MHz to 20MHz is 1MHz step and step at 20MHz to 400MHz can be set at 20MHz step.

If the correct value is not set, value will be set at a larger value automatically.

Example) If Span Input is 50 MHz, it would automatically be set at 60 MHz.

First, push the Shift Key in order to set up Span. Then the top-left ICON is changed to.

After that, push the No. 2 Key. So then Frequency Input window changes the Span Input State.

Enter the span size and then input the appropriate unit such as Run (GHz), Mode (MHz) or Sweep (kHz) Key.

Set up Span Mode

**STEP 1**
- Push the Shift Key

**STEP 2**
- Push the No. 2 Key
- When the Sweep (kHz) Key is pressed, the top-left ICON is changed to FREE Run, SQUELCH Run and SINGLE Run in order.
Frequency Input

Chosen Reception Mode, Sweep Mode and Span are showed on the top center of LCD. At first, choose Reception Mode and Sweep Mode to get a sense of the Frequency Bandwidth and a specific feel for analyzing.

Choosing Frequency Value is a way to inputting Center and Start/Stop Frequency. In order to input Center Frequency, just pushes the numeral keys. Press the key when Frequency Input Window is a CENT state.

Push the Shift Key to input Start/Stop Frequency. Then, push the No. 1(Start/Stop) Key, to input Start Frequency in Frequency Input Window. Input Frequency by using the No. 0 to 9 Keys, Dot Key, MARKER (DEL) Key and Run (GHz) as Unit Input Key, Mode (MHz) and SWEEP (kHz) Key.

Execution will be done automatically, after inputting the last Unit in the Frequency, according to a given Sweep Mode of Run-Scanning Mode. If the mode is Single Run, push the Run (GHz) Key and then execute Run-Scanning again.

A wrong inputting content can be erased by using the MARKER (DEL) Key. The MARKER (DEL) Key operates like the backspace on a PC.

Erase inputted Frequency and then push the Marker (DEL) Key once more; you are now out of Frequency Input Mode.
Frequency Input

**STEP 1**
- Check the state of Frequency Input Window.
  You can input Center Frequency when state of Frequency Input Window is CENT.

**STEP 2**
- Input a desired Center Frequency

**STEP 3**
- Input a unit by using the Run, Mode and Sweep Key

Start/Stop Frequency Input

**STEP 1**
- Push the Shift Key

**STEP 2**
- Push the No. 1 Key

**STEP 3**
- Make sure that Frequency Input Window is changed to Start Input Mode. Input a desired Frequency to use the numeral keys and the Dot Key

**STEP 4**
- Input a unit to use the Run, Mode and Sweep Key

**STEP 5**
- Make sure that Frequency Input Window is changed to Stop Input Mode. Input a desired Frequency using the numeral keys and Dot Key.

**STEP 6**
- Input a unit to use the Run, Mode and Sweep Key.
Adjust screen Level

To Settle Top Level- Reference Level and Level Resolution on screen.

“RLEV” is an abbreviation of Reference Level.
Choose through the Up/Down Keys and establish the level using the Enter Key. Top Level in the vertical axis would be changed to be established Value.

“DIFF” is an abbreviation of Difference.
Choose through the Up/Down Keys and establish to use the Enter Key. Level Step in verticality axis would be changed to established Value.

<table>
<thead>
<tr>
<th>RLEV</th>
<th>Choose through the Up/Down Keys and push the Enter Key.</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIFF</td>
<td>Choose through the Up/Down Keys and push the Enter Key.</td>
</tr>
</tbody>
</table>
Run-Scanning

Run-Scanning is a process interpreting Frequency according to established Frequency Bandwidth and Span. And Run-scanning processes operates by established Sweep Modes.
Protek 7830 has Center Marker, Marker 1, Delta Marker (Marker1 and Marker2) and Squelch Marker. Each Marker Mode is displayed on the top-left as a Marker Mode ICON.

<table>
<thead>
<tr>
<th>Marker Mode</th>
<th>Marker ICON</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Center Marker</td>
<td><img src="image" alt="Center Marker ICON" /></td>
<td>Center Marker</td>
</tr>
<tr>
<td>Marker 1</td>
<td><img src="image" alt="Marker 1 ICON" /></td>
<td>Users can move Marker 1 to the desired position.</td>
</tr>
<tr>
<td>Marker 2</td>
<td><img src="image" alt="Marker 2 ICON" /></td>
<td>Users can move Marker1 or Marker 2 to the desired position. Users can see the difference of 2 markers.</td>
</tr>
<tr>
<td>Squelch Marker</td>
<td><img src="image" alt="Squelch Marker ICON" /></td>
<td>When making FM/AM/SSB signals to be audible, this marker is working as a volume of the sound and this marker is used to set a standard for the Squelch Run.</td>
</tr>
</tbody>
</table>
Center Marker is not a Mode the users can select when using Mark Mode in the basic operations. When inputting Start Frequency and Stop Frequency, Center Frequency, the information will appear automatically. Frequency and Level on Center Frequency will be indicated on Frequency Input Window.
To use Marker 1, press the Marker (DEL) key in Center Marker status. When it turns to Marker 1 mode, Marker mode icon is changed to . And frequency input window is changed to Center Marker to Marker 1.

To move the Marker 1, use the Up/Down keys, or the Knob key. Then the frequency value and level value are displayed on frequency input window.

**STEP 1**
- Press the Marker (DEL) Key.
- Check the Marker 1 mode in display window

**STEP 2**
- To move the Marker 1 to wanted plot point, please use the Up/Down keys, or Knob key.
- Then the frequency value and level value are displayed in the frequency input window.
Press the Marker (DEL) Key until the Marker mode icon is changed to Delta Marker in the display window. And in this case, Marker 2 is added.

The Marker mode is the total four modes. And the changing order of Marker mode is as below:

Center → Marker 1 → Delta Marker → Squelch Marker

To handle the Marker 1, users can set up the marker 1 in Marker mode 1
To handle the Marker 2, users can set up the marker 2 in Delta Marker

When users set up the Delta Marker, the frequency value and level value of Marker 2 are displayed in the frequency input window. The frequency value and level value of Marker 1, and the difference level value between Marker 1 and Marker 2 are displayed in the Marker window.
Marker

**STEP 1**
- Press the **Marker (DEL)** key.
- Check the Delta Marker mode in the display window

**STEP 2**
- To move the Marker 1 to the desired plot point, please use the **Up/Down** keys, or **Knob** key.
- Then, the frequency value and level value of Marker 2 are displayed in the frequency input window.

  The frequency value and level value of Marker 1, and the difference level value between Marker 1 and Marker 2 are displayed in the Marker window. Then the frequency value and level value are displayed in the frequency input window.
To know the magnitude of frequency, users can use the Squelch Marker. Also, users can set up the Squelch Marker for setting the Squelch Level of Sweep mode and speaker output for a larger signal than Squelch Level through modulation for audio frequency ranges. (Modulation: Frequency modulation, Amplitude modulation, and SSB Modulation)

Press the **Marker (DEL)** Key until the Marker mode icon is changed to the Squelch Marker in the display window.
**Marker**

**STEP 1**
- Press the Marker key.
- Check the Squelch Marker mode.

**STEP 2**
- Move the Squelch Marker to the desired point using the Up/Down Keys or Knob Key.
- The squelch value is displayed in the lower right display window.

![SQL display](image)
To use the Peak Search function, this function must be run in Marker 1 mode.

Press the **Marker (DEL)** Key until the Marker 1 icon and Marker 1 are displayed in the display window.

The Marker mode is the total four modes and the changing order of Marker mode is as below:

Center → Marker 1 → Delta Maker → Squelch Marker

Move the Marker 1 to the desired point using the **Up/Down** Keys or **Knob** Key.

Press the **Shift** key to change the **DEL** icon to the **SHIFT**. And press the **No. 4 (PK Search)** key.
**Marker**

**STEP 1**
- Press the **Marker (DEL)** \(^{\text{Marker}}_{\text{DEL}}\) Key.
- Check the Marker 1 \(^{\text{MP}}\) mode in the display window.

**STEP 2**
- Press the **Shift** \(^{\text{Shift}}\) key

**STEP 3**
- Press the **No. 4 (PK Search)** \(^{\text{4}}\) key.

Then, the Marker 1 is moved to the peak point, and the frequency value and level value are displayed in the frequency input window.

The function for Peak Search must be run in only Marker 1 \(^{\text{MP}}\) mode
To use the function of moving Marker 1 to the center or Marker 1 to the peak value of the display window, this function must be run in Marker 1 mode.

Press the Shift key to change the upper right icon to . And press the No. 5 Key. Then, the Marker 1 position will be in the center of the display window (Center frequency).

Also, to find the peak value, press the Shift key and push No. 4 Key. Then, the marker will be located in the point of a highest signal.
Marker

**STEP 1**
- Press the Marker (DEL) \[\text{Marker}\] Key.
- Check the Marker 1 \[\text{MP}\] mode in the display window.

**STEP 2**
- Move the Marker 1 to the desired point using the Up/Down \[\text{Up/Down}\] Keys or Knob \[\text{Knob}\] Key

**STEP 3**
- Run the function for Peak Search by pushing Shift + No.4
- Make sure that the marker is located on the peak signal.

**STEP 4**
- Press the Shift \[\text{Shift}\] key

**STEP 5**
- Press the No. 5 (Marker to CNT) \[\text{5}\] key

The function for Peak/Marker to Center must be run only in Marker 1 \[\text{MP}\] mode
Marker

- **Channel Power Measurement**

To run the function for channel power measurement, users can get into this mode by pushing Shift + No. 6 (CH Power) or selecting Channel Power item in the main menu. The above display shows the illustration of the channel power measurements.

The default channel power bandwidth is the half of the span size. In this mode, the span size can be adjustable by pushing Shift + No. 2(Span).

In this mode, the Marker to Center frequency function is disabled and if the Peak search function or Marker key is selected, the channel power mode comes to an end and the system is working based on the input mode.
Marker

**STEP 1**
- Press the Shift + No. 6 (CH Power) Or
- Select CH. POWER item on Marker in the main menu.

**STEP 2**
- Input the center frequency.

**STEP 3**
- Move the Marker to select the desired channel power ranges using the Up/Down Keys or Knob Key

**STEP 4**
- To be out of this mode
Press the Shift + No. 6 (CH Power) Or
Select CH. POWER item on Marker in the main menu.
Setting of Attenuator

The internal attenuator is used for maximum input signal -20dBm with Menu function.

To set the internal attenuator, press the Shift key to change the upper right icon to SHIFT.

And press the No. 9 (ATTN) key.

To adjust the value of internal attenuator, press the Up/Down Keys or rotate the Knob key. And Press the Enter key.
The LCD Light is designed to ease the use of the instrument in a dark location.

Press the Shift key to change the upper right icon to SHIFT.

And press the No. 7 (LCD Light) key.

*The Power ON/OFF of the LCD Light will toggle

**STEP 1**
- Press the Shift key

**STEP 2**
- Press the No. 7 (LCD Light) key

If the LCD light is ON, the battery will drain faster than usual.
LCD Contrast

The function of LCD contrast is to adjust the contrast for the remaining battery capacity.

Press the Shift key to change the upper right icon to SHIFT.

And press the No. 8 (LCD Contrast) key.

The LCD contrast is adjusted by using the Up/Down keys or Knob key. And press the Enter key.

**STEP 1**
- Press the Shift key

**STEP 2**
- Press the No. 8 (LCD Contrast) key

**STEP 3**
- To adjust the LCD contrast, use the Up/Down keys or Knob key and press the Enter key.
User can set the Buzzer ON/OFF (Toggle ON/OFF)

Press the **Shift** Key. Then the Icon \[\text{BEEP}\] of left upper window is changed to shift icon \[\text{SHIFT}\].

And press the **Dot** Key.

**STEP 1**
- Press the **Shift** key

**STEP 2**
- Press the **Dot** Key
Save/Load

The function of Save/Load is for the Waveform and Setup Status.

The function of Save is for concurrently saving the Waveform and Setup Status in memory. And the saved Setup Status in memory includes the following information: Reception mode, Sweep mode, Frequency range, Step value, and Span value. User can use this with Menu or Multi key.

The function of Load is for loading the saved Waveform and Setup Status in memory. If user only wants the Setup Status, please load the saved file for desired Setup Status. And press the Run key. Then this measuring instrument will complete the Run-scanning operation. User can only use this in Menu.

The function of Delete is for deleting the saved file. Also, users can only use this in the Menu.
**Save/Load**

**STEP 1**
- Press the **Shift** key

**STEP 2**
- Press the **Enter** key

**STEP 3**
- To save the waveform or setup status, a name with at least 7 characters is required.
- To select each character, use the **Up/Down** keys. And press the **Enter** key.
- If you want to save the file name fewer than 10 characters, press the “END’ on stated inputted file name.

**STEP 4**
- To delete the character, press the **Marker** key

**STEP 5**
- When all 7 characters included blank are typed, press the **Enter** key. Then, output message for SAVE OK is displayed.
  - “SAVE OK”
- If user does not type the all 7 characters included blank, the function of save is not completed

**STEP 6**
- To cancel the Save, press the **Marker** key until the first character is deleted. And additionally press the **Marker** key one time.
- Then the Save is canceled and the output message is displayed as below.
  - “SAVE FAILED”
- The values to be saved are signal and system setting values. Buzzer, LCD contrast and LCD light states are not saved.
Save/Load

**Load**

**STEP 1**
- Press the Shift key

**STEP 2**
- Press the Menu key

**STEP 3**
- To load the waveform or setup status, select a filename to retrieve.
- To select the first character, use the Up/Down keys. And press the Enter key

The function of Load is to load the saved waveform and setup status.
If user only wants to load only setup status, load the user's saved data and press the Run key.
Then system will run in loading setup status. (Run-scanning)
STEP 1
- Press the Menu key

STEP 2
- To select the DELETE, use the Up/Down keys or Knob key and press the Enter key

STEP 3
- To delete the saved data, select the user’s saved data using the Up/Down keys or Knob key. And press the Enter key. Then the saved data will be deleted

STEP 4
- Confirm to prevent users from losing data mistakenly
Select the F.counter under Main Menu – function.

The input connector for the frequency counter is BNC connector.

When the input level is inputted into the Frequency Counter, the measured frequency value is displayed in the frequency input window.

**Input level is as below.**

- 9 MHz to 2,000 MHz: 150m Vrms
- 20 MHz to 1,000 MHz: 100m Vrms
- 2,000 MHz to 2,900 MHz: 400m Vrms
Frequency Counter

**STEP 1**
- Press the Menu key

**STEP 2**
- To select the FUNCTION, use the Up/Down keys or Knob key and press the Enter key.
- Then sub menu is opened.

**STEP 3**
- To select the F. COUNTER (Frequency Counter), use the Up/Down keys or Knob key and press the Enter key

**STEP 4**
- The icon FCNT is displayed from the other icon.
The FCNT is displayed in the frequency input window

**STEP 5**
- When the input level is inputted in the Frequency Counter using BNC connector, the measured frequency value is displayed in the frequency input window

**STEP 6**
- To change the Frequency Counter mode to Spectrum mode, run the upper Step 1 to Step 3. At this time, select the SPECTRUM not F. COUNTER in Step 3
Power Source

Checking for Battery

To check the battery’s remained capacity Battery, users can refer to the battery icon on the upper area of the display window.

- **How to use and replace the battery**

  [Please refer to the batter section in details.]
Setting of the Unit

The setting for level unit can be set up in the Menu.
The level unit can be set up as below
- [ ] dBm
- [ ] dBuV
- [ ] dBmV

STEP 1
- Press the Menu key

STEP 2
- To select the LEVEL UNIT, use the Up/Down keys or Knob key and press the Enter key.
Then sub menu is opened.

STEP 3
- To select the user’s wanted level unit, use the Up/Down keys or Knob key and press the Enter key.
Reset

The function of Reset is for initializing the memory or system. The three kinds of resets are supported. And these resets are run through the Menu

- **Preset**
  System Reboot for initial setup status.
  (Center Frequency, Span Frequency, Marker and etc)

- **Memory CLR**
  The user’s saved data will be cleared. (Memory Cleared)

- **System INIT**
  The upper two resets (PRESET and MEMORY CLR) are run.
  Then, system reboot for initial setup status and the user’s saved data will be cleared

**STEP 1**
- Press the Menu key

**STEP 2**
- To select the RESET, use the Up/Down keys or Knob key and press the Enter key.
- Then, sub menu is opened.

**STEP 3**
- To run one of Reset modes, use the Up/Down keys or Knob key and press the Enter key.
- Then, the selected reset will be run.

**STEP 4**
- Confirm the selection again to prevent users from losing their data mistakenly.
Baud Rate

The setting of the baud rate is for the transmission speed. The Baud Rate between PC and 7830 system is as below.

115,200 BPS
57,600 BPS
38,400 BPS
19,200 BPS
9,600 BPS
4,800 BPS

**STEP 1**
- Press the Menu key

**STEP 2**
- To select the BAUD RATE, use the Up/Down keys or Knob key and press the Enter key.
Then, sub menu is opened.

**STEP 3**
- To select the baud rate value users want, use the Up/Down keys or Knob key and press the Enter key
Connection for PC

To connect 7830 to a PC, carefully follow the procedures as below.

1. Make sure the serial cable is connected from a PC to 7830.

2. Choose “CONNECT PC” on the main menu.

3. Run 7830 GUI Program on the PC.

**STEP 1**
- Press the **Menu** key

**STEP 2**
- To select the CONNECT PC, use the **Up/Down** keys or **Knob** key and press the **Enter** key. Then, sub menu is opened.

**STEP 3**
- To select the REMOTE PC, use the **Up/Down** keys or **Knob** key and press the **Enter** key. Then, run the GUI Program included in the package.
Auto Power Saving

The Auto Power saving function is used to conserve system power. When “NONE” is not selected, the power source will be turned off automatically based on the time users select.

The auto power OFF time is same as below

NONE
05MINUTES
10MINUTES
20MINUTES
30MINUTES

STEP 1
- Press the Menu key twice

STEP 2
- To select the AUTO POWER, use the Up/Down keys or Knob key and press the Enter key. Then, sub menu is opened.

STEP 3
- To select the auto power time, use the Up/Down keys or Knob key and press the Enter key
Offset

Level Offset compensates for any loss due to the cabling. Offset adds the value of +Offset to all the values of measurement.

**STEP 1**
- Press the **Menu** key twice.

**STEP 2**
- Set the cursor on Offset using the **Up/Down** Keys or **knob** Key.

**STEP 3**
- Push the **Enter** Key and then move to the submenu.
- Input the dB value of Offset.
- Push the **Enter** Key

**STEP 4**
- Push the **Menu** Key once more to exit the system menu.
Functions in the main menu can be selected using the combination keys or through the Menu.

The functions that can be selected in the main menu mode are as below.

- Level Unit
- Reset
- Band Rate
- Connect PC

To exit from Menu or System, push the Menu key or push the Dot key. These keys will move users to the menu items either lower or higher. In the tree structured menu.
**Menu**

**STEP 1**
- Press the **Menu** key

**STEP 2**
- To select functions users want, use the **Up/Down** Keys or the **Knob** Key.

**STEP 3**
- Push the **Enter** Key

**STEP 4**
- After selecting function of sub items or On/Off, push the **Enter** Key

**STEP 5**
- Exit the Menu after pushing the **Menu** Key twice.
- When the **Menu** Key is pushed one time, it leads users to System Menu.
### Menu

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<th>Function</th>
<th>Spectrum</th>
<th>Set up the functions of Spectrum and frequency counter.</th>
</tr>
</thead>
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<td></td>
<td>Frequency Counter</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TEST Mode</td>
<td></td>
</tr>
<tr>
<td>Reception Mode</td>
<td>N-FM</td>
<td>Set up the Reception Mode.</td>
</tr>
<tr>
<td></td>
<td>W-FM</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SSB</td>
<td></td>
</tr>
<tr>
<td></td>
<td>AM</td>
<td></td>
</tr>
<tr>
<td>Sweep Mode</td>
<td>Free Run</td>
<td>Set up the Sweep Mode.</td>
</tr>
<tr>
<td></td>
<td>Squelch Run</td>
<td>The mode can be set up with the \text{Shift} Key.</td>
</tr>
<tr>
<td></td>
<td>Single Run</td>
<td></td>
</tr>
<tr>
<td>Marker</td>
<td>None</td>
<td>Marker or function using the Marker.</td>
</tr>
<tr>
<td></td>
<td>Marker</td>
<td>The mode can be set up with the \text{Shift} Key.</td>
</tr>
<tr>
<td></td>
<td>Delta MKR</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Squelch MKR</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PK Search</td>
<td></td>
</tr>
<tr>
<td></td>
<td>MKR 2 CENT</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CHAN POWER</td>
<td></td>
</tr>
<tr>
<td>Save</td>
<td>Save Data</td>
<td>The mode can be set up with the \text{Shift} Key.</td>
</tr>
<tr>
<td>Load</td>
<td>Load Data</td>
<td>The mode can be set up with the \text{Shift} Key.</td>
</tr>
<tr>
<td>Level Unit</td>
<td>DBm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>DbuV</td>
<td></td>
</tr>
<tr>
<td></td>
<td>DBmV</td>
<td></td>
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</tbody>
</table>
## Menu

<table>
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<tr>
<th>Reset</th>
<th>Pre Reset</th>
<th>Restarting the System and clear all the parameters for setup</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Memory CLR</td>
<td>Delete the stored data</td>
</tr>
<tr>
<td></td>
<td>System INIT</td>
<td>All Reset – restarting the system and delete the stored data</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Band Rate</th>
<th>115,200 BPS</th>
<th>Select the speed of serial communication between the unit and PC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>57,600 BPS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>38,400 BPS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>19,200 BPS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>9,600 BPS</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4,800 BPS</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Connect PC</th>
<th>None</th>
<th>Select the connection to PC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Remote PC</td>
<td></td>
</tr>
</tbody>
</table>
There are modes that select the function using the Shift Key and the other keys. Also, the functions can be selected from main Menu and System Menu.

To exit from Menu or System, push the Menu Key or push the Dot key, this will move users up to higher menu items in the tree structured menu. The functions that can be selected in the System Menu are as below.
System

Get into System Menu

STEP 1
- Press the **Menu** Key
- Or **Shift** + **No. 0** key is a shortcut for the System Menu (Go to Step3)

STEP 2
- Press the **Menu** Key once more.

STEP 3
- To select desired function, use the **Up/Down** Keys or the **Knob** Key

STEP 4
- Press the **Enter** Key

STEP 5
- After selecting a lower item function or On/Off, push the **Enter** Key

STEP 6
- Push the **Menu** Key once to exit the System
# System

<table>
<thead>
<tr>
<th>Setting</th>
<th>Options</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auto Power</td>
<td>None, 05 Minutes, 10 Minutes, 20 Minutes, 30 Minutes</td>
<td>Select auto power saving mode.</td>
</tr>
<tr>
<td>Buzzer</td>
<td>ON, OFF</td>
<td>Select Buzzer On/Off.</td>
</tr>
<tr>
<td>LCD Light</td>
<td>ON, OFF</td>
<td>Select LCD Light On/Off.</td>
</tr>
<tr>
<td>LCD Contrast</td>
<td>1 to 10 Step</td>
<td></td>
</tr>
<tr>
<td>INT. Atten.</td>
<td>0 dB, 10 dB, 20 dB, 30 dB, 35 dB</td>
<td></td>
</tr>
<tr>
<td>Offset</td>
<td>-99.0 dB to 99.0 dB</td>
<td></td>
</tr>
<tr>
<td>Default save</td>
<td>SAVE</td>
<td>During booting, save default values to be applied.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>When saving the values, all values will be saved except signals.</td>
</tr>
</tbody>
</table>
Description of key operations

Run [GHz]

- **Instruction to start scanning frequencies**

  After power on, this button will work as it did under the most recent setup, or when Squelch Run or Single Run function is activated.

  [Please refer to the Scan section for basic operations in details if needed]

- **Selecting a unit (GHz) to input Start/ Stop/ Scan/ Center frequencies.** After inputting the frequency values, push this key to add a unit of GHz.

Mode [MHz]

- **Selecting Reception Mode**

  The following Reception Modes can be selected WFM, NFM, AM and SSB.

  [Please refer to the Reception Mode section for detailed basic operations.]

- **Selecting a unit (MHz) to input Start/ Stop/ Scan/ Center frequencies.**

  After inputting the value of frequencies, push this key to add a unit of MHz.
**Sweep [kHz]**

- **Selecting Sweep Mode**

  This button selects the Sweep Mode such as FREE Run, SQUELCH Run and SINGLE Run. 

  [Please refer to the Sweep Mode section for detailed basic operations.]

- **Selecting a unit (kHz) to input Start/Stop/Scan/Center frequencies.**

  After inputting the value of frequencies push this key to add a unit of kHz.

---

**Marker [DEL]**

- **Selecting Marker functions.**

  After pushing this button, please select Marker functions such as Center Marker, Marker 1, Delta Marker and Squelch Marker.

  [Please refer to the Marker section for basic operations in details.]

- **This is a delete function when setting up Start/Stop/Scan/Center frequencies.**

  When inputting the frequency values, the Marker Key can be used as the Delete Key working as a backspace key on a PC.
No. 1 [Start/Stop] 1

- Press the No. 1 key to input the value of 1.

To input the value of numeral 1 in the Start/Stop/Scan/Center frequencies, please use the No. 1 Key.

- Pressing the Shift Key and No.1 key will activate the Input function for Start/Stop Mode.

Select the Start/Stop Mode by pushing the Shift Key and than push the numeral Key.

[Please refer to the Frequency Input section for basic operations.]

No. 2 [Span] 2

- Push the No. 2 key to input the value of 2.

To input the value of numeral 2 in the Start/Stop/Scan/Center Mode, push the No. 2 Key.

- Span Frequency Input function can be activated by pushing Shift Key

By pushing the Shift Key and than pushing the No. 2 Key, the Span Mode is activated.

[Please refer to the Span section for detailed basic operations.]
No. 3 [Level] 3

- Push the No. 3 3 key to input the value of 3.

In order to input the value of numeral 3 in the Start/Stop/Scan/Center frequencies, push the No. 3 3 Key.

- Display Level Adjustment Function by pushing Shift Key.

On pushing the Shift Key and then push the No. 3 3 Key, users can adjust the basic level of vertical axis and level steps on the display.

[Please refer to the Display Level Adjustment section for detailed basic operations if needed.]

No. 4 [PK Search; Peak Search] 4

- Push the No. 4 4 key to input the value of 4

Use the No. 4 4 Key to input the value of numeral 4 in the Star/Stoop/Scan/Center frequencies.

- Marker Search and Peak Search can be activated by selecting the Marker after pushing the Shift Key.

Peak Search Function, one of the marker functions, is selected by pushing the Shift Key and then pushing the No. 4 4 Key.

[Please refer to the Peak Search section for detailed basic operations if needed.]
No. 5 [MKR to CNT; Marker to Center] 5

- Push the No. 5 5 key to input the value of 5.

  Push the No. 5 5 Key to input the value of numeral 5 in the Start/Stop/Scan/Center frequencies.

- Activate the Marker to Center Function using the Marker menu after pushing the Shift Shift Key.

  On pushing the Shift Shift Key and then push the No. 5 5 Key, Marker to Center, one of the marker functions, can be selected.

  [Please refer to the Marker to Center section for detailed descriptions for using the Marker Function if needed.]

No. 6 [CH Power; Channel Power] 6

- Push the No. 6 6 key to input the value of 6.

  The No. 6 6 Key is used to input the value of numeral 6 in the Start/Stop/Scan/Center frequencies.

- Selecting Channel Power Function using the Marker function after pushing the Shift Shift Key

  By pushing the Shift Shift key and then pushing the No. 6 6 Key, Channel Power, one of marker functions, is selected.

  [Please refer to the Channel Power section for detailed basic operations if needed]
No. 7 [LCD Light] 7

- Push the No. 7 7 key to input the value of 7.
  
  When inputting the value of numeral 7 in the Start/Stop/Scan/Center frequencies, the No. 7 7 Key is used.

- LCD Light Function after pushing the Shift Shift Key
  
  By pushing the Shift Shift key and then pushing the No. 7 7 Key, LCD Light is turned on or off.

  [Please refer to the LCD Light section for details about basic operations if needed.]

No. 8 [LCD CONT; LCD Contrast] 8

- Push the No. 8 8 key to input the value of 8.
  
  To input the value of numeral 8 in the Start/Stop/Scan/Center frequencies, the No. 8 8 Key is used.

- LCD Contrast Function after pushing the Shift Shift Key
  
  By pushing the Shift Shift key and then pushing the No. 8 8 Key, users can adjust the LCD Contrast level.

  [Please refer to the LCD Contrast section for details on basic operations.]
No. 9 [Attenuator] 9

- Push the No. 9 9 key to input the value of 9.

To input the value of numeral 9 in the Start/Stop/Scan/Center frequencies, the No. 9 9 Key is used

- Attenuator Setup Function after pushing the Shift Shift Key

By pushing the Shift Shift key and then pushing the No. 9 9 Key, users can select the level of an internal attenuator.

[Please refer to the Attenuator Setup section for details about basic operations.]

No. 0 [System] 0

- Push the No. 0 0 key to input the value of 0.

When inputting the value of numeral 0 in the Start/Stop/Scan/Center frequencies, the No. 0 0 Key is used.

- System Setup Function after pushing the Shift Shift Key

By pushing the Shift Shift key and the No. 0 0 Key, System Setup function is selected.

[Please refer to the System Setup section for details about basic operations.]
Using the Function Key

The **Shift** key does not perform any functions by itself. The Shift Key is used to perform functions printed below the numeral keys. If the shift key is pressed twice, CENT/SPAN located on the bottom of display is changed to START/STOP.

Dot [Buzzer]

The Dot key is used to input a decimal point. When inputting the value of Decimal Point in the Start/Stop/Scan/Center frequencies, this key is used.

Buzzer Setup Function after pushing the Shift Key

By pushing the Shift key and then pushing the Dot Key, Buzzer On or OFF is selected.

[Please refer to the Buzzer section for details on basic operation.]

Return Function on Menu and System

Return Function is used to return from lower Menu to higher Menu on Main Menu and System Manu.
Menu [Load]  

- **Menu Function**

Various functions can be selected after entering Menu..

At the Menu, pushing the Menu Key again; it will activate the System Menu.

[Refer the section of Menu and System of basic operation if need more detail]

- **Load Function after pushing the Shift Key.**

By pushing the Shift key and the Menu Key, stored data are loaded after selecting a file on the list

[Please refer to the Store Mode section for details of basic operation.]

Enter [Save]  

- **Enter Function**

The Enter Key is used to select Menu or System items.

- **Save/Load Function after pushing Shift Key**

By pushing the Shift key and Enter Key, data are saved after typing a file name.

[Please refer to the Save/Load section for details about basic operations.]
Up/Down Keys and Knob Key

- Up/Down Keys and Knob Key Functions

Up/Down keys and knob are used for the movement of markers and menu / system items.
USER'S MANUAL
Protek G632 Tracking Generator
1. Protek G632

Protek G632 has been developed as a CW Signal Generator, which generates signal at −55 to −65dBm within 30MHz to 2.9GHz bandwidth. G632 is connected to Protek7830 via RS-232.

2. Features

Protek G632 is a tracking generator for handheld Spectrum Analyzer 7830. G632 supports signal generating function & analyzing function.

3. Specification

<table>
<thead>
<tr>
<th>Item</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>Range 30MHz ~ 2.9GHz</td>
</tr>
<tr>
<td>Amplitude</td>
<td>Measurement Range (-)55dBm ~ (-)65dBm / 5dB steps</td>
</tr>
<tr>
<td></td>
<td>Amplitude Units DBm</td>
</tr>
<tr>
<td></td>
<td>Level Accuracy ±2.0dB (Typical–95%)(@20℃~30℃)</td>
</tr>
<tr>
<td></td>
<td>±3.0dB (Other–5%) (@20℃~30℃)</td>
</tr>
<tr>
<td>Power</td>
<td>Power Source SMPS Type AC Adapter DC 12V</td>
</tr>
<tr>
<td></td>
<td>((Using RS-232, Power supply is provided by 7830)</td>
</tr>
<tr>
<td>Dimension &amp; Weight</td>
<td>Size (W X H X D) 60 X 135 X 40mm</td>
</tr>
<tr>
<td></td>
<td>Weight Approximately 200g</td>
</tr>
<tr>
<td>Interface</td>
<td>Interface RS-232</td>
</tr>
<tr>
<td>General Specification</td>
<td>Operation Temperature 0℃ ~ 40℃, Spec</td>
</tr>
<tr>
<td></td>
<td>Secured Temperature (@20℃~30℃)</td>
</tr>
<tr>
<td></td>
<td>Humidity 0% ~ 80% RH</td>
</tr>
<tr>
<td></td>
<td>RF Output Connector N Type Connector</td>
</tr>
</tbody>
</table>
4. Operation

PROTEK 7830 – MENU – MENU – GEN OUTPUT – “LEVEL SELECTION” (-55/-60/-65dBm)

5. G632~7830 Level Setting Procedure

1) Connect cable between G632 and 7830
2) Signal generated from G632 at -60dBm
3) Check 7830 Level
4) Level difference between -60dBm and 7830 can be compensated from
   “offset” menu in 7830

※ 7830 offset setting procedure

;7830, MENU – MENU – OFFSET – (+)/(-) selection – input offset value in dB – ENTER
6. Application: 900MHz Band Pass Filter Test

<Test Conditions>

A. Tracking Generator Output Signal Level: –60dBm
B. Measuring Device: 900MHz Band Pass Filter
C. Test Block Diagram

<Test Results>

A. 7830 Output Signal Level: –61.70dBm
B. Path Loss(G632~7830): 1.5dB
   1) Band Pass Filter: 1.4dB  2) Cable Loss: 0.1dB
C. 7830 LCD Display (Center Freq.: 900MHz, SPAN: 100MHz, Mode: Wide FM)

(Before connecting Filter)  (After connecting Filter)
7. Cautions when linking G632 to 7830

A. Fix Int. Atten.: Fix INT. Atten of 7830 to 20 dB when connecting with G632.
B. Ext. Atten.
   - Ext. Atten of 7830 disabled when connecting with G632.
C. 7830 Mode Change: Changing Mode disabled when connecting with G632.