# DIGITAL MULTI CHANNEL ANALYZER

# NaI527 SPECTROMETER SERIES

**GBS ELEKTRONIK GmbH**

## DESCRIPTION

The NaI527 series combines a NaI(TI) crystal, a photo-multiplier tube, high voltage power supply, a preamplifier and a multi channel analyzer within one rugged housing.

GBS Elektronik offers various NaI(Tl)crystal-sizes to meet customers requirements regarding sensivity, spectroscopic performance or budget. Our standard crystal size is 63x63mm, but can be also prearranged in sizes of 40x40mm, 51x51mm, 76x76mm and 125x70mm.

The NaI527 spectrometers are categorized in their respective computer interfaces and comes either with USB- *(NaI527)*, Ethernet & USB- *(NaI527E)* or with a RS485 *(NaI527R)* computer interface. The spectrometer is powered from the USB-port, or by "Power over Ethernet". Furthermore we offer fixed cable versions for each computer interface. Due to the integration of all hardware components, which are required for a full gamma spectroscopy system in one package, only one cable is necessary to connect the system to a computer or network switch.

The NaI527 spectrometer can be operated with our free of charge software programs, such as Win SPEC or WinMCS.

| KEY FEATURES | BENEFITS |
|---|---|
| *High integrated all-in-one spectrometer, with up to 4k channel resolution* | • *High performance gamma spectroscopy at very low power consumption of 0.7W*<br>• *Power via computer interface* |
| *Detector size can be chosen, crystal sizes of 40x40mm, 51x51mm, 63x63mm, 76x76mm and 125x70mm are available.* | • *Customer requirements in terms of sensivity and spectrometric resolution can be selected* |
| *Functional tripod & beaker optional available Fixed cable versions available* | • *Excellent operability and mobility*<br>• *Robust connection, avoids loosening* |
| *Fully digital signal processing* | • *All parameter are computer adjustable*<br>• *Allows a wide range of filter settings* |
| *Eloxed aluminum housing* | • *Excellent electrical shielding and robustness* |

# Technical Specification

## NaI527 Series

**GBS ELEKTRONIK GmbH**

### Detector Crystal Sizes

| | |
|---|---|
| 40mm x 40mm | Option -40 |
| 51mm x 51mm | Option -51 |
| 63mm x 63mm    (standard version) | Option -63 |
| 76mm x 76mm | Option -76 |
| 125m x 70mm | Option -125 |

### Spectrometric Performance

| | |
|---|---|
| _Example_<br>Resolution: 2k channels<br>Cs137 sample, measured with NaI<br>Detector size:  63mm x 63mm | (FWHM)<br><br><5.8 % |
| Throughput into memory<br>(input rate 150kcps,<br>0.2µs shaping time) | > 100.000cps |

### Operation Modes

| | |
|---|---|
| PHA (Pulse Height Analysis) | ✓ |
| MCS (Multichannel Scaling) | ✓ |
| Sample Mode (Transient Record) | ✓ |
| Oscilloscope Mode | ✓ |
| Firmware Repeat Mode | ✓ |

### Digital Signal Processing

| | |
|---|---|
| Trigger Filter | double differential filtering |
| Differential non-linearity | <1%<br>(for 2k, @ 1µs shaping time) |
| Pile Up Rejection | ✓ |
| Pulse Pair Resolution | ~400ns |
| Trigger Threshold Adjustment | automatically / manually |
| Shaping Time | 0.1µs to 2µs, step 0.1 |
| Flat Top Time | 0µs to 15µs, step 0.1 |
| Fine Gain Adjustment | 0.5 to 6.5, step 0.0001 |
| Channel Splitting | 128, 256, 512, 1024, 2048, 4096 |
| Base Line Restorer | BLR with fixed averaging |
| Pole Zero Adjustment | Decay time down to 40µs can be compensated |
| Peak Stabilization Modes | standard mode |

### Analog Digital Converter

| | |
|---|---|
| Sample Rate | 10MS/s |
| Resolution | 14bit |
| Integral non-linearity | ≤0.05% |

### Amplifier Unit

| | |
|---|---|
| Type | Charge sensitive preamplifier for photomultiplier tubes |
| Gain Steps | 10, 50 |
| Integrated bias supply | 0V to 1000V,<br>(software adjustable) |
| Input- and bias voltage monitoring | ✓ |

### Power supply

| | | |
|---|---|---|
| NaI527 | (µUSB Version) | via USB PC-Port,    ≤500mA |
| NaI527E | (Ethernet Version) | - Power over Ethernet  ≤ 2W<br>- USB PC-Port            ≤ 500mA<br>- USB wall-adapter      ≤ 500mA |
| NaI527R | (RS485 Version) | via USB–A PC port (Adapter) |
| Power consumption | | 0.7W |

### Computer Interface

| | | |
|---|---|---|
| NaI527 | (µUSB Version) | USB 2.0 compliant |
| NaI527E | (Ethernet Version) | - Ethernet 10/100Mbit, RJ45<br>- µUSB 2.0 compliant |
| NaI527R | (RS485 Version) | - RS485    compliant<br>- USB 2.0 compliant (adapter) |

### Mechanical

| | |
|---|---|
| Dimensions ( Ø x L ) | 83.5mm x 296mm |
| Installed Pin Socket | JEDEC B14A |
| Weight | ~1350g |

### Environmental Conditions

| | |
|---|---|
| Operation Temperature Range | 0°C − 50°C |
| Humidity | ≤90%, non condensing |
| IP Protection Class | IP42 |

V18.02