DN2.49x - 16 channel 16 bit digitizerNETBOX up to 60 MS/s

- 4, 8 or 16 channels with 10 MS/s up to 60 MS/s
- Software selectable single-ended or differential inputs
- Simultaneously sampling on all channels
- Additional digital inputs as option available
- Separate ADC and amplifier per channel
- Complete on-board calibration
- 6 input ranges: ±200 mV up to ±10 V
- 512 MSample/1 GSample standard acquisition memory
- Programmable input offset of ±100%
- Window, pulse width, re-arm, spike, OR/AND trigger
- Streaming, ABA mode, Multiple Recording, Gated Sampling

Operating Systems
- Windows 7 (SP1), 8, 10, Server 2008 R2 and newer
- Linux Kernel 2.6, 3.x, 4.x, 5.x
- Windows/Linux 32 and 64 bit

SBench 6 Professional Included
- Acquisition, Generation and Display of analog and digital data
- Calculation, FFT
- Documentation and Import, Export

Drivers
- LabVIEW, MATLAB, LabWindows/CVI
- Visual C++, C++ Builder, GNU C++, VB.NET, C#, J#, Delphi, Java, Python
- IVI

General Information
The digitizerNETBOX DN2.49x series allows recording of up to 16 channels with sampling rates of 30 MS/s or 8 channels with sampling rates of 60 MS/s. These Ethernet Remote instruments offer outstanding A/D features both in resolution and signal quality. The inputs can be switched between Single-Ended with a programmable offset and true differential. If used in differential mode each two inputs are connected together reducing the number of available channels by half.

The 16 bit vertical resolution have four times the accuracy compared to 14 bit products and sixteen times the accuracy if compared with a 12 bit product. The digitizerNETBOX can be installed anywhere in the company LAN and can be remotely controlled from a host PC.

<table>
<thead>
<tr>
<th>Model</th>
<th>1 channel</th>
<th>2 channels</th>
<th>4 channels</th>
<th>8 channels</th>
<th>16 channels</th>
</tr>
</thead>
<tbody>
<tr>
<td>DN2.491-04</td>
<td>10 MS/s SE</td>
<td>10 MS/s SE</td>
<td>10 MS/s SE</td>
<td>10 MS/s SE</td>
<td>10 MS/s SE</td>
</tr>
<tr>
<td>DN2.491-08</td>
<td>10 MS/s SE</td>
<td>10 MS/s SE</td>
<td>10 MS/s SE</td>
<td>10 MS/s SE</td>
<td>10 MS/s SE</td>
</tr>
<tr>
<td>DN2.491-16</td>
<td>10 MS/s SE</td>
<td>10 MS/s SE</td>
<td>10 MS/s SE</td>
<td>10 MS/s SE</td>
<td>10 MS/s SE</td>
</tr>
<tr>
<td>DN2.496-04</td>
<td>60 MS/s SE</td>
<td>60 MS/s SE</td>
<td>60 MS/s SE</td>
<td>60 MS/s SE</td>
<td>60 MS/s SE</td>
</tr>
<tr>
<td>DN2.496-08</td>
<td>60 MS/s SE</td>
<td>60 MS/s SE</td>
<td>60 MS/s SE</td>
<td>60 MS/s SE</td>
<td>60 MS/s SE</td>
</tr>
<tr>
<td>DN2.496-16</td>
<td>60 MS/s SE</td>
<td>60 MS/s SE</td>
<td>60 MS/s SE</td>
<td>60 MS/s SE</td>
<td>60 MS/s SE</td>
</tr>
</tbody>
</table>

SE = Single Ended Input
Diff = True Differential Input
Software Support

Windows Support
The digitizerNETBOX/generatorNETBOX can be accessed from Windows 7, Windows 8, Windows 10 (each 32 bit and 64 bit). Programming examples for Visual C++, C++ Builder, LabWindows/CVI, Delphi, Visual Basic, VB.NET, C#, J#, Python, Java and IWI are included.

Linux Support
The digitizerNETBOX/generatorNETBOX can be accessed from any Linux system. The Linux support includes SMP systems, 32 bit and 64 bit systems, versatile programming examples for GNU C++, Python as well as drivers for MATLAB for Linux. SBench 6, the powerful data acquisition and analysis software from Spectrum is also included as a Linux version.

Discovery Protocol
The Discovery function helps you to find and identify any Spectrum LXI instruments, like the digitizerNETBOX and generatorNETBOX, available to your computer on the network. The Discovery function will also locate any Spectrum card products that are managed by an installed Spectrum Remote Server somewhere on the network.

After running the discovery function the card information is cached and can be directly accessed by SBench 6. Furthermore the qualified VISA address is returned and can be used by any software to access the remote instrument.

SBench 6 Professional
The digitizerNETBOX and generatorNETBOX can be used with Spectrum’s powerful software SBench 6 – a Professional license for the software is already installed in the box. SBench 6 supports all of the standard features of the instrument. It has a variety of display windows as well as analysis, export and documentation functions.

- Available for Windows XP, Vista, Windows 7, Windows 8, Windows 10 and Linux
- Easy to use interface with drag and drop, docking windows and context menus
- Display of analog and digital data, X-Y display, frequency domain and spread signals
- Designed to handle several GBytes of data
- Fast data preview functions

IVI Driver
The IVI standards define an open driver architecture, a set of instrument classes, and shared software components. Together these provide critical elements needed for instrument interchangeability. IVI’s defined Application Programming Interfaces (APIs) standardize common measurement functions reducing the time needed to learn a new IVI instrument.

The Spectrum products to be accessed with the IVI driver can be locally installed data acquisition cards, remotely installed data acquisition cards or remote LXI instruments like digitizerNETBOX/generatorNETBOX. To maximize the compatibility with existing IVI based software installations, the Spectrum IVI driver supports IVI Scope, IVI Digitizer and IVI FGen class with IVI-C and IVI-COM interfaces.

Third-party Software Products
Most popular third-party software products, such as LabVIEW, MATLAB or LabWindows/CVI are supported. All drivers come with examples and detailed documentation.

Embedded Webservice
The integrated webservice follows the LXI standard and gathers information on the product, set up of the Ethernet configuration and current status. It also allows the setting of a configuration password, access to documentation and updating of the complete instrument firmware, including the embedded remote server and the webservice.

Hardware features and options

LXI Instrument
The digitizerNETBOX and generatorNETBOX are fully LXI instrument compatible to LXI Core 2011 following the LXI Device Specification 2011 rev. 1.4. The digitizerNETBOX/generatorNETBOX has been tested and approved by the LXI Consortium.

Located on the front panel is the main on/off switch, LEDs showing the LXI and Acquisition status and the LAN reset switch.

digitizerNETBOX/generatorNETBOX chassis version V2
The chassis version V2 got a complete re-design to allow some new features that improve the handling especially for mobile and shared usage:

- 8 bumper edges protect the chassis, the desk and other components on it. The bumper edges allow to store the chassis either vertically or horizontally and the lock-in structure allows to stack multiple chassis with a secure fit onto each other. For 19” rack mount montage the bumpers can be unmounted and replaced by the 19” rack mount option
- The handle allows to easily carry the chassis around in juts one hand.
- A standard GND screw on the back of the chassis allows to connect the metal chassis to measurement ground to reduce noise based on ground loops and ground level differences.

Front Panel
Standard BNC connectors are used for all analog input or output signals and all auxiliary signals like clock and trigger. No special adapter cables are needed and the connection is secure even when used in a moving environment.
Custom front panels are available on request even for small series, be it SMA, LEMO connectors or custom specific connectors.

**Ethernet Connectivity**

The GBit Ethernet connection can be used with standard COTS Ethernet cabling. The integration into a standard LAN allows to connect the digitizerNETBOX/generatorNETBOX either directly to a desktop PC or laptop or it is possible to place the instrument somewhere in the company LAN and access it from any desktop over the LAN.

**DC Power Supply Option**

The digitizerNETBOX/generatorNETBOX can be equipped with an internal DC power supply which replaces the standard AC power supply. Two different power supply options are available that range from 9V to 36V. Contact the sales team if other DC levels are required. Using the DC power supply the digitizerNETBOX/generatorNETBOX can be used for mobile applications together with a Laptop in automotive or airborne applications.

**Boot on Power on Option**

The digitizerNETBOX/generatorNETBOX can be factory configured to automatically start and boot upon availability of the input power rail. That way the instrument will automatically become available again upon loss of input power.

**Input Amplifier**

The analog inputs can be adapted to real world signals using a wide variety of settings that are individual for each channel. By using software commands the input termination can be changed between 50 Ohm and 1 MOhm, one can select a matching input range and the signal offset can be compensated for.

**Differential inputs**

With a simple software command the inputs can be individually switched from single-ended (in relation to ground) to differential by combining each two single-ended inputs to one differential input. When the inputs are used in differential mode the A/D converter measures the difference between two lines with relation to system ground.

**Automatic on-board calibration**

All of the channels are calibrated in factory before the board is shipped. To compensate for different variations like PC power supply, temperature and aging, the software driver provides routines for an automatic onboard offset and gain calibration of all input ranges. All the cards contain a high precision on-board calibration reference.

**Digital inputs**

This option acquires additional synchronous digital channels phase-stable with the analog data. When the option is installed there are 16 additional digital inputs on 4 channel A/D instruments and 32 digital inputs on A/D instruments with 8 and more channels.

The digital inputs can be multiplexed into the analog data by software command using many different formats:

- Each 16 digital inputs can replace one analog channel.
- Each 2 digital inputs can be multiplexed into an analog channel with a resolution reduced to 14 bit.
- Each 4 digital inputs can be multiplexed into an analog channel with a resolution reduced to 12 bit.

**Ring buffer mode**

The ring buffer mode is the standard mode of all oscilloscope instruments. Digitized data is continuously written into a ring memory until a trigger event is detected. After the trigger, post-trigger samples are recorded and pre-trigger samples can also be stored. The number of pre-trigger samples available simply equals the total ring memory size minus the number of post trigger samples.

**FIFO mode**

The FIFO mode is designed for continuous data transfer between remote instrument and PC memory or hard disk. The control of the data stream is done automatically by the driver on interrupt request. The complete installed on-board memory is used for buffer data, making the continuous streaming extremely reliable.

**Channel trigger**

The data acquisition instruments offer a wide variety of trigger modes. Besides the standard signal checking for level and edge as known from oscilloscopes it’s also possible to define a window trigger. All trigger modes can be combined with the pulsewidth trigger. This makes it possible to trigger on signal errors like too long or too short pulses. In addition to this a re-arming mode (for accurate trigger recognition on noisy signals) the AND/OR conjunction of different trigger events is possible. As a unique feature it is possible to use deactivated channels as trigger sources.

**External trigger I/O**

All instruments can be triggered using an external TTL signal. It’s possible to use positive or negative edge also in combination with a programmable pulse width. An internally recognised trigger event can - when activated by software - be routed to the trigger connector to start external instruments.

**Pulse width**

Defines the minimum or maximum width that a trigger pulse must have to generate a trigger event. Pulse width can be combined with channel trigger, pattern trigger and external trigger.

**Multiple Recording**

The Multiple Recording mode allows the recording of several trigger events with an extremely short re-arming time. The hardware doesn’t need to be restarted in between. The on-board memory is divided in several segments of the same size. Each of them is filled with data if a trigger event occurs. Pre- and posttrigger of the segments can be programmed. The number of acquired segments is only limited by the used memory and is unlimited when using FIFO mode.
### Gated Sampling

The Gated Sampling mode allows data recording controlled by an external gate signal. Data is only recorded if the gate signal has a programmed level. In addition a pre-area before start of the gate signal as well as a post area after end of the gate signal can be acquired. The number of gate segments is only limited by the used memory and is unlimited when using FIFO mode.

### Timestamp

The timestamp function writes the time positions of the trigger events in an extra memory. The timestamps are relative to the start of recording, a defined zero time, externally synchronized to a radio clock, an IRIG-B or GPS receiver. Using the external synchronization gives a precise time relation for acquisitions of systems on different locations.

### ABA mode

The ABA mode combines slow continuous data recording with fast acquisition on trigger events. The ABA mode works like a slow data logger combined with a fast digitizer. The exact position of the trigger events is stored as timestamps in an extra memory.

### Option Embedded Server

The option turns the digitizerNETBOX/generatorNETBOX in a powerful PC that allows to run own programs on a small and remote data acquisition system. The digitizerNETBOX/generatorNETBOX is enhanced by more memory, a powerful CPU, a freely accessible internal SSD and a remote software development access method. The digitizerNETBOX/generatorNETBOX can either run connected to LAN or it can run totally independent, storing data to the internal SSD. The original digitizerNETBOX/generatorNETBOX remote instrument functionality is still 100% available. Running the embedded server option it is possible to pre-calculate results based on the acquired data, store acquisitions locally and to transfer just the required data or results parts in a client-server based software structure. A different example for the digitizerNETBOX/generatorNETBOX embedded server is surveillance/logger application which can run totally independent for days and send notification emails only over LAN or offloads stored data as soon as it’s connected again.

Access to the embedded server is done through a standard text based Linux shell based on the ssh secure shell.

### External clock I/O

Using a dedicated connector a sampling clock can be fed in from an external system. It’s also possible to output the internally used sampling clock to synchronise external equipment to this clock.

### Reference clock

The option to use a precise external reference clock (normally 10 MHz) is necessary to synchronize the instrument for high-quality measurements with external equipment (like a signal source). It’s also possible to enhance the quality of the sampling clock in this way. The driver automatically generates the requested sampling clock from the fed in reference clock.
**DN2 / DN6 Technical Data**

### Analog Inputs

- **Resolution**: 16 bit (can be reduced to acquire simultaneous digital inputs)
- **Input Range**: ±200 mV, ±500 mV, ±1 V, ±2 V, ±5 V, ±10 V
- **Input Type**: software programmable
- **Input Offset (single-ended)**: programmable to ±100% of input range in steps of 1%
- **ADC Differential non-linearity (DNL)**: ADC only
- **ADC Integral non-linearity (INL)**: ADC only
- **Offset error (full speed)**: after warm-up and calibration ≤ 0.1%
- **Gain error**: after warm-up and calibration ≤ 0.1%
- **Cross-talk**: Signal ≤ 1 MHz, 50 ohm range ≤ 0 dB on adjacent channels (all card types)
- **CMRR (Common Mode Rejection Ratio)**: range ≤ 1 V 100 kHz: 59 dB, 1 MHz: 53 dB, 10 MHz: 41 dB
- **Sync accuracy**: ±2V 100 kHz: 59 dB, 1 MHz: 53 dB, 10 MHz: 52 dB
- **Channel selection (true differential inputs)**: software programmable 1, 2, 4 or 8 channels (maximum is model dependent)
- **Channel selection (true differential inputs)**: software programmable 1, 2 or 4 channels (maximum is model dependent)

### Trigger

- **Available trigger modes**: software programmable
- **Trigger level resolution**: software programmable 14 bit
- **Trigger edge**: software programmable Rising edge, falling edge or both edges
- **Trigger pulse width**: software programmable 0 to [4k - 1] samples in steps of 1 sample
- **Trigger delay**: software programmable 0 to [4k - 1] samples in steps of 1 sample
- **Multi, Gate, re-arming time**: software programmable < 4 samples (= programmed pretrigger)
- **Pretrigger at Multi, ABA, Gate, FIFO**: software programmable 4 up to [875 Samples / number of active channels] in steps of 4
- **Posttrigger**: software programmable 8 up to [installed memory / number of active channels] samples in steps of 4
- **Memory depth**: software programmable 8 up to [installed memory / 2 / active channels] samples in steps of 4
- **Multiple Recording/ABA segment size**: software programmable
- **Trigger output delay**: One positive edge after internal trigger event
- **Internal/External trigger accuracy**: ±1 sample
- **External trigger input**: software programmable
- **External trigger maximum voltage**: ±2 V up to ±5.7 V (internally clamped to 5.0 V, 100 mA max. clamping current)
- **Trigger impedance**: software programmable 50 Ohm / high impedance [≥ 4kOhm]
- **External trigger output type**: 3.3 V TTL
- **External trigger output levels**: Low ≤ 0.4 V, High ≥ 2.4 V, TTL compatible
- **External trigger output drive strength**: Capable of driving 50 ohm load, maximum drive strength ±128 mA

### Clock

- **Clock Modes**: software programmable internal PLL, internal quartz, external reference clock, sync
- **Internal clock range (PLL mode)**: software programmable 1 kHz to max using internal reference, 50kHz to max using external reference clock
- **Internal clock accuracy**: ±20 ppm
- **Internal clock setup granularity**: ±1% of range (100M, 10M, 1M, 100K...): Examples: range 1M to 10M: stepsize = 100K
- **External reference clock range**: software programmable ≥ 1.0 MHz and ≤ 125.0 MHz
- **External reference clock impedance**: software programmable 50 Ohm / high impedance [≥ 4kOhm]
- **External reference clock range**: software programmable 54 ns
- **External reference clock type/edge**: 3.3V TTL compatible, rising edge used
- **External reference clock input**: Low level ≤ 0.8 V, High level ≥ 2.0 V, duty cycle: 45% - 55%
- **External reference clock maximum voltage**: ±0.5 V up to ±3.8 V (internally clamped to 3.3 V, 100 mA max. clamping current)
- **External reference clock maximum voltage**: 3.3 V TTL
- **Internal ADC clock output type**: Low ≤ 0.4 V, High ≥ 2.4 V, TTL compatible
- **Internal ADC clock output levels**: ±2V 100 kHz: 59 dB, 1 MHz: 53 dB, 10 MHz: 52 dB
- **Synchronization clock divider**: software programmable 2 up to [Bk - 2] in steps of 2
- **ABA mode clock divider for slow clock**: software programmable 8 up to [3242B0 in steps of 8]
- **Minimum ADC clock before using Oversampling**: 3 MHz/s

### Digital Inputs Option

- **Digital data acquisition modes**: software programmable 8 inputs, per channel definable: ADC 16 bit, ADC 14 bit + 2 DI, ADC 12 bit + 4 DI
- **Digital inputs delay to analog sample**: ≥ 4.7 kOhm with Bus-Hold circuitry, unused inputs can be left floating, override current ≤ 500 µA
- **Input Impedance**: ±0.3 V up to ±5.5 V (internally clamped to 3.3 V and ground, 200 mA max. clamping current)
- **Input voltage**: Low ≤ 0.8 V, High ≥ 2.0 V (TTL compatible)
Connectors

Analog Inputs
- 9 mm BNC female (one for each single-ended input) (Cable-Type: Cab-9m-xxxx)

Trigger A Input/Output
- 9 mm BNC female (programmable direction) (Cable-Type: Cab-9m-xxxx)

Trigger B Input
- 9 mm BNC female (Cable-Type: Cab-9m-xxxx)

Clock Input/Output
- 9 mm BNC female (programmable direction) (Cable-Type: Cab-9m-xxxx)

Timestamp Reference Clock Input
- 9 mm BNC female (Cable-Type: Cab-9m-xxxx)

Option digitizerNETBOX/generatorNETBOX embedded server (DN2.xxx-Emb, DN6.xxx-Emb)

CPU
- Intel Quad Core 2 GHz

System memory
- 4 GByte RAM

System data storage
- Internal 128 GByte SSD

Development access
- Remote Linux command shell (ssh), no graphical interface (GUI) available

Accessible Hardware
- Full access to Spectrum instruments, LAN, front panel LEDs, RAM, SSD

Integrated operating system
- OpenSuse 12.2 with kernel 4.4.7

Internal PCIe connection
- DN2.20, DN2.46, DN2.47, DN2.49, DN2.60 PCIe x1, Gen1
- DN6.46, DN6.49, DN6.59 PCIe x1, Gen2
- DN2.22, DN2.44, DN2.66 PCIe x1, Gen2
- DN6.59, DN6.22, DN6.44, DN6.66 PCIe x1, Gen2

LAN Connection
- Standard RJ45

LAN Speed
- Auto Sensing: GBit Ethernet, 100BASE-T, 10BASE-T

LAN IP address
- Programmable

Sustained Streaming speed
- DN2 20, DN2.46, DN2.47, DN2.49 up to 70 MByte/s
- DN6.46, DN6.49 up to 100 MByte/s
- DN2.59, DN2.22, DN2.44, DN2.66 up to 100 MByte/s
- DN6.9, DN6.22, DN6.44, DN6.66 up to 100 MByte/s

Used TCP/UDP Ports
- Webserver: 80
- mDNS Daemon: 5353
- UPnP Daemon: 1900
- Spectrum Remote Server: 1026, 5025

Ethernet specific details

Power connection details

Mains AC power supply
- Input voltage: 100 to 240 VAC, 50 to 60 Hz

AC power supply connector
- IEC 60320-1-C14 (PC standard coupler)

Power supply cord
- Power cord included for Schuko contact (CEE 7/7)

Serial connection (RS232)
- For diagnostic purposes only. Do not use, unless being instructed by a Spectrum support agent.

Serial connection details (DN2.xxx with hardware ≥ V11)

Serial connection (RS232)

Certification, Compliance, Warranty

EMC immunity
- Compliant with CE Mark

EMC Emission
- Compliant with CE Mark

Product warranty
- 5 years starting with the day of delivery

Software and firmware updates
- Lifetime, free of charge

Dynamic Parameters

<table>
<thead>
<tr>
<th></th>
<th>M2i.491x</th>
<th>M2i.4931</th>
<th>M2i.496x</th>
</tr>
</thead>
<tbody>
<tr>
<td>max internal/external clock</td>
<td>10 MS/s</td>
<td>31.25 MS/s</td>
<td>62.5 MS/s</td>
</tr>
<tr>
<td>min internal clock</td>
<td>1 k/s</td>
<td>1 k/s</td>
<td>1 k/s</td>
</tr>
<tr>
<td>min external reference clock</td>
<td>1 MS/s</td>
<td>1 MS/s</td>
<td>1 MS/s</td>
</tr>
<tr>
<td>-3 dB bandwidth</td>
<td>&gt; 5 MHz</td>
<td>&gt; 15 MHz</td>
<td>&gt; 30 MHz</td>
</tr>
<tr>
<td>Zero noise level (Range ±200 mV and ±2 V)</td>
<td>&lt; 5.0 LSB rms</td>
<td>&lt; 5.5 LSB rms</td>
<td>&lt; 7.0 LSB rms</td>
</tr>
<tr>
<td>Zero noise level (all other ranges)</td>
<td>&lt; 4.0 LSB rms</td>
<td>&lt; 4.5 LSB rms</td>
<td>&lt; 5.0 LSB rms</td>
</tr>
<tr>
<td>Test - sampling rate</td>
<td>10 MS/s</td>
<td>30 MS/s</td>
<td>60 MS/s</td>
</tr>
<tr>
<td>Test signal frequency</td>
<td>1 MHz</td>
<td>1 MHz</td>
<td>1 MHz</td>
</tr>
<tr>
<td>SNR (typ)</td>
<td>≥ 77.1 dB</td>
<td>≥ 76.4 dB</td>
<td>≥ 74.5 dB</td>
</tr>
<tr>
<td>THD (typ)</td>
<td>≤ 80.5 dB</td>
<td>≤ 80.5 dB</td>
<td>≤ 80.0 dB</td>
</tr>
<tr>
<td>SFDR (typ), excl. harm.</td>
<td>≥ 93.3 dB</td>
<td>≥ 93.3 dB</td>
<td>≥ 92.2 dB</td>
</tr>
<tr>
<td>ENOB (based on SNR)</td>
<td>≥ 12.5 LSB</td>
<td>≥ 12.3 LSB</td>
<td>≥ 12.1 LSB</td>
</tr>
<tr>
<td>ENOB (based on SINAD)</td>
<td>≥ 12.2 LSB</td>
<td>≥ 12.2 LSB</td>
<td>≥ 12.0 LSB</td>
</tr>
</tbody>
</table>

Dynamic parameters are measured at ±1 V input range (if no other range is stated) and 50Ω termination with the samplerate specified in the table. Measured parameters are averaged 20 times to get typical values. Test signal is a pure sine wave generated by a signal generator and a matching bandpass filter. Amplitude is >99% of FSR. SNR and RMS noise parameters may differ depending on the quality of the used PC. SNR = Signal to Noise Ratio, THD = Total Harmonic Distortion, SFDR = Spurious Free Dynamic Range, SINAD = Signal Noise and Distortion, ENOB = Effective Number of Bits.
DN2 specific Technical Data

Environmental and Physical Details DN2.xxx

- **Dimension of Chassis without connectors or bumpers**: L x W x H = 366 mm x 267 mm x 87 mm
- **Dimension of Chassis with 19" rack mount option**: L x W x H = 366 mm x 482.6 mm x 87 mm (2U height)
- **Weight (1 internal acquisition/generation module)**: 6.3 kg, with rack mount kit: 6.8 kg
- **Weight (2 internal acquisition/generation modules)**: 6.7 kg, with rack mount kit: 7.2 kg
- **Warm up time**: 20 minutes
- **Operating temperature**: 0°C to 40°C
- **Storage temperature**: -10°C to 70°C
- **Humidity**: 10% to 90%

- **Dimension of packing (single DN2)**: L x W x H = 470 mm x 390 mm x 180 mm
- **Volume weight of Packing (single DN2)**: 7.0 kgs

Power Consumption

<table>
<thead>
<tr>
<th></th>
<th>230 VAC</th>
<th>12 VDC</th>
<th>24 VDC</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 channel versions, standard memory</td>
<td>0.24 A</td>
<td>55 W</td>
<td>TBD</td>
</tr>
<tr>
<td>8 channel versions, standard memory</td>
<td>0.26 A</td>
<td>60 W</td>
<td>TBD</td>
</tr>
<tr>
<td>16 channel versions, standard memory</td>
<td>0.37 A</td>
<td>85 W</td>
<td>TBD</td>
</tr>
<tr>
<td>4 channel versions, 1 x 1 GSampalre memory</td>
<td>0.28 A</td>
<td>65 W</td>
<td>TBD</td>
</tr>
<tr>
<td>8 channel versions, 1 x 1 GSample memory</td>
<td>0.30 A</td>
<td>70 W</td>
<td>TBD</td>
</tr>
<tr>
<td>16 channel versions, 2 x 1 GSampalre memory</td>
<td>0.48 A</td>
<td>105 W</td>
<td>TBD</td>
</tr>
</tbody>
</table>

**MTBF**

MTBF: 100000 hours
• The number of maximum channels and internal digitizer modules and existence of a synchronization Star-Hub is model dependent.
Order Information

The digitizerNETBOX is equipped with a large internal memory for data storage and supports standard acquisition (Scope), FIFO acquisition (streaming), Multiple Recording, Gated Sampling, ABA mode and Timestamps. Operating system drivers for Windows/Linux 32 bit and 64 bit, drivers and examples for C/C++, IVI (Scope and Digitizer class), LabVIEW (Windows), MATLAB (Windows and Linux), .NET, Delphi, Java, Python and a Professional license of the oscilloscope software SBench 6 are included.

The system is delivered with a connection cable meeting your countries power connection. Additional power connections with other standards are available as option.

digitizerNETBOX DN2 - Ethernet/LXI Interface

<table>
<thead>
<tr>
<th>Order no.</th>
<th>A/D Resolution</th>
<th>Bandwidth</th>
<th>Single-Ended Channels</th>
<th>Differential Channels</th>
<th>Sampling Speed</th>
<th>Installed Memory</th>
<th>Available Memory Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>DN2.491-04</td>
<td>16 Bit</td>
<td>5 MHz</td>
<td>4 channels</td>
<td>2 channels</td>
<td>10 MS/s</td>
<td>1 x 512MS</td>
<td>1 x 1GS</td>
</tr>
<tr>
<td>DN2.491-08</td>
<td>16 Bit</td>
<td>5 MHz</td>
<td>8 channels</td>
<td>4 channels</td>
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<td>16 Bit</td>
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<td>16 channels</td>
<td>8 channels</td>
<td>10 MS/s</td>
<td>2 x 512MS</td>
<td>2 x 1GS</td>
</tr>
<tr>
<td>DN2.496-04</td>
<td>16 Bit</td>
<td>30 MHz</td>
<td>4 channels</td>
<td>2 channels</td>
<td>60 MS/s (2 channels)</td>
<td>1 x 512MS</td>
<td>1 x 1GS</td>
</tr>
<tr>
<td>DN2.496-08</td>
<td>16 Bit</td>
<td>30 MHz</td>
<td>8 channels</td>
<td>4 channels</td>
<td>60 MS/s (4 channels)</td>
<td>1 x 512MS</td>
<td>1 x 1GS</td>
</tr>
<tr>
<td>DN2.496-16</td>
<td>16 Bit</td>
<td>30 MHz</td>
<td>16 channels</td>
<td>8 channels</td>
<td>60 MS/s (8 channels)</td>
<td>2 x 512MS</td>
<td>2 x 1GS</td>
</tr>
</tbody>
</table>

Options

<table>
<thead>
<tr>
<th>Order no.</th>
<th>Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>DN2.xxx-Rack</td>
<td>19&quot; rack mounting set for self mounting</td>
</tr>
<tr>
<td>DN2.xxx-Emb</td>
<td>Extension to Embedded Server: CPU, more memory, SSD. Access via remote Linux secure shell (ssh)</td>
</tr>
<tr>
<td>DN2.xxx-1x1GS</td>
<td>Memory extension to 1 x 1 GSample for 46x-04, 46x-08, 49x-04, 49x-08 versions</td>
</tr>
<tr>
<td>DN2.xxx-2x1GS</td>
<td>Memory extension to 2 x 1 GSample for 46x-16 and 49x-16 versions</td>
</tr>
<tr>
<td>DN2.xxx-DC12</td>
<td>12 VDC internal power supply. Replaces AC power supply. Accepts 9 V to 18 V DC input. Screw terminals.</td>
</tr>
<tr>
<td>DN2.xxx-DC24</td>
<td>24 VDC internal power supply. Replaces AC power supply. Accepts 18 V to 36 V DC input. Screw terminals</td>
</tr>
<tr>
<td>DN2.xxx-BTPWR</td>
<td>Boot On Power On: the digitizerNETBOX/generatorNETBOX automatically boots if power is switched on.</td>
</tr>
</tbody>
</table>

Calibration

<table>
<thead>
<tr>
<th>Order no.</th>
<th>Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>DN2.xxx-Recal</td>
<td>Recalibration of complete digitizerNETBOX/generatorNETBOX DN2 including calibration protocol</td>
</tr>
</tbody>
</table>

BNC Cables

The standard adapter cables are based on RG174 cables and have a nominal attenuation of 0.3 dB/m at 100 MHz.

<table>
<thead>
<tr>
<th>Connections</th>
<th>Connection</th>
<th>Length</th>
<th>to SMA male</th>
<th>to SMA female</th>
<th>to BNC male</th>
<th>to SMA female</th>
</tr>
</thead>
<tbody>
<tr>
<td>All BNC</td>
<td>BNC male</td>
<td>80 cm</td>
<td>Cab-9m-3mA-80</td>
<td>Cab-9m-3fA-80</td>
<td>Cab-9m-9m-80</td>
<td>Cab-9m-3fA-80</td>
</tr>
<tr>
<td>All 80 cm BNC</td>
<td>BNC male 200 cm</td>
<td>Cab-9m-3mA-200</td>
<td>Cab-9m-3fA-200</td>
<td>Cab-9m-9m-200</td>
<td>Cab-9m-3fA-200</td>
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</tr>
</tbody>
</table>

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