

ARTISAN®
TECHNOLOGY GROUP

Your **definitive** source for quality pre-owned equipment.

**Artisan Technology Group**
(217) 352-9330 | sales@artisantg.com | artisantg.com

**Full-service, independent repair center**
with experienced engineers and technicians on staff.

**We buy your excess, underutilized, and idle equipment**
along with credit for buybacks and trade-ins.

**Custom engineering**
so your equipment works exactly as you specify.

- Critical and expedited services
- In stock / Ready-to-ship
- Leasing / Rentals / Demos
- ITAR-certified secure asset solutions

**Expert team | Trust guarantee | 100% satisfaction**

All trademarks, brand names, and brands appearing herein are the property of their respective owners.

Find the *HBM / LDS Nicolet GN812* at our website: *Click HERE*

Data sheet

# GEN series
# GN812

## Basic ISO 1 MS/s Input Card



### Special features

- **8 analog channels**
- **Unbalanced differential inputs**
- **± 1 V to ± 50 V input range**
- **250 V DC Isolation**
- **User selectable digital Bessel and FIR filters**
- **1 MS/s sample rate**
- **16 bit resolution**
- **512 MB memory**
- **Single isolated BNC for each channel**

**Basic ISO 1 MS/s Input Card**

The GEN DAQ Basic ISO 1 MS/s Input Card is a general purpose signal conditioner for use with voltage inputs, externally conditioned signals or isolated probes and current clamps. The basic signal conditioner provides eight channels of isolated single ended voltage inputs from ± 1 V to ± 50 V full scale with full offset and auto-zero capability. Every channel is equipped with an independent full range input amplifier, 7-pole Bessel and Butterworth anti-alias filter, 16-bit Analog-to-Digital converter operating at 1 MS/s and several selections of digital filtering.

The on-board transient memory size is 256 Mega-Samples (512 Mega-Bytes). The memory is shared among enabled channels. Each channel also features two set-points for trigger or alarm purposes. Extensive acquisition and trigger modes allow many different ways to capture valuable data even at the highest sample rates. All channels are synchronously sampled at full speed without multiplexing and almost immeasurable crosstalk. The model uses standard isolated BNC connectors, whose shells are connected to isolated ground. The inputs are 1 MΩ impedance and are compatible with isolated probes and current clamps.



Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

| Capabilities Overview | |
|---|---|
| Model | GN812 |
| Maximum sample rate per channel | 1 MS/s |
| Memory per card | 512 MB |
| Analog channels | 8 |
| ADC resolution | 16 bit |
| Digital event/Timer/Counter support | no |
| Isolation | yes; channel to channel and channel to chassis |
| Input type | Analog isolated single ended, unbalanced differential (1) |

(1) An unbalanced differential input can be used to do isolated single ended and differential measurements.

## GEN series GN812 Block diagram

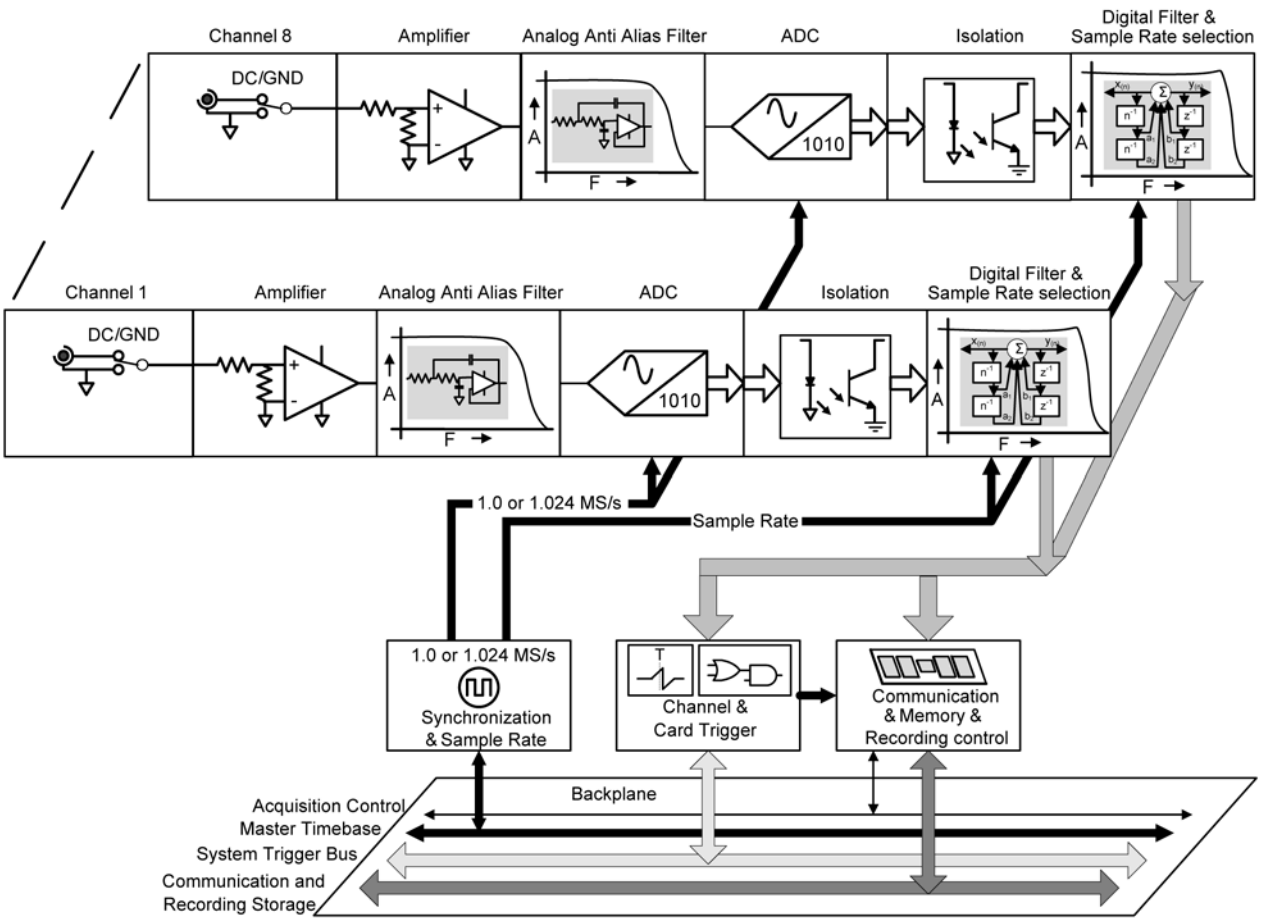



**Figure 1.1:** Block diagram GEN series GN812

**Note** *The listed specifications are valid for cards that are calibrated, and used in the same mainframe and slots as they were at the time of calibration. When the card is removed from its original location and placed in another slot and/or mainframe the following specifications are invalidated due to thermal differences within the configurations: Offset error, Gain error and MSE. Typically the resulting specification will be double.*



Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

| Analog Input Section | |
|---|---|
| Channels | 8 |
| Connectors | Fully isolated BNC (Plastic), 1 per channel |
| Input type | Analog isolated single ended, unbalanced differential |
| Input coupling | DC, GND |
| Impedance | 1 MΩ ± 1% // 65 pF ± 10% |
| Ranges | ± 1 V, ± 2 V, ± 5.0 V, ± 10 V, ± 20 V, ± 50 V<br>Each fixed range supports a variable gain with 1000 steps (0.1 %).<br>Variable gain creates 1000 extra ranges between 2 fixed ranges. |
| Offset | ± 50 % in 1000 steps (0.1 %);<br>± 50 V range has fixed 0 % offset |
| DC Offset error | |
| Wideband | 0.1 % of Full Scale ± 2 mV |
| Bessel IIR and FIR | 0.1 % of Full Scale ± 10 µV |
| Offset error drift | ± 100 ppm/°C (± 180 ppm/°F) |
| DC Gain error | |
| Wideband | 0.1 % of Full Scale ± 2 mV |
| Bessel IIR and FIR | 0.1 % of Full Scale ± 10 µV |
| Gain error drift | ± 70 ppm/°C (± 130 ppm/°F) |
| Maximum static error (MSE) | |
| Wideband | 0.1 % of Full Scale ± 2 mV |
| Bessel IIR and FIR | 0.1 % of Full Scale ± 10 µV |
| RMS Noise | |
| Wideband | 0.02 % of Full Scale ± 10 µV |
| Bessel IIR and FIR | 0.02 % of Full Scale ± 10 µV |
| Common Mode | |
| Rejection Ratio (CMRR) | > 72 dB @ 80 Hz |
| Voltage | 250 V DC |
| Input overload protection | |
| Maximum voltage | ± 250 V DC |
| Overload recovery time | Restored to 0.1 % accuracy in less than 1 µs after 200 % overload |

| Isolation | |
|---|---|
| Channel-to-chassis | ± 250 V DC |
| Channel-to-channel | ± 500 V DC |
| Non-destructive, to chassis (earth) | ± 250 V DC |

| Analog to Digital Conversion | |
|---|---|
| Sample rate; per channel | 0.1 S/s to 1 MS/s |
| ADC resolution; one ADC per channel | 16 bit |
| ADC Type | Successive Approximation Register (SAR); TI ADS8401IB |
| Time base accuracy | Defined by mainframe: ± 3.5 ppm (1); aging after 10 years ± 10 ppm |
| Binary sample rate | Supported; when Calculating FFT's produces rounded/integer BIN sizes |
| Maximum binary sample rate | 1.024 MS/s |
| External time base sample rate | 0 S/s to 500 kS/s |
| External time base level | TTL |
| External time base minimum pulse width | 200 ns |

(1) Mainframes using Interface/Controller modules shipped before 2012: ± 30 ppm



Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

## Amplifier Bandwidth and Filtering

| Using different filter selections (Wideband/Bessel IIR/FIR/etc.) or different filter bandwidths will lead to phase mismatches between channels. | |
|---|---|
| Wideband | When wideband is selected there is neither an analog anti alias filter, nor any digital filter in the signal path. Therefore there is no anti alias protection when wideband is selected. Should not be used if working in frequency domain with recorded data. |
| Bessel IIR (Fc @ -3 dB) | When Bessel IIR filter is selected, this is always a combination of an analog Bessel anti alias filter and a digital Bessel IIR filter.<br>Bessel filters are typically used when looking at signals in the time domain. Best used for measuring transient signals or sharp edge signals like square waves or step responses. |
| FIR (Fc @ -0.1 dB) | Standard FIR filter with corner frequency (Fc) defined at -0.1 dB.<br>When FIR filter is selected, this is always a combination of an analog Butterworth anti alias filter and a digital FIR filter.<br>Best used when working in the frequency domain. When working in the time domain this filter is best used for signals that are (close to) sine waves. |
| FIR (Fc @ -3 dB)<br>Supported by Perception V6.40 and higher | Adapted FIR filter with corner frequency (Fc) calculated as close as possible to -3 dB.<br>When FIR filter is selected, this is always a combination of an analog Butterworth anti alias filter and a digital FIR filter.<br>Best used when working in the frequency domain. When working in the time domain this filter is best used for signals that are (close to) sine waves. |

## Wideband

When wideband is selected there is neither an analog anti alias filter, nor any digital filter in the signal path. Therefore there is no anti alias protection when wideband is selected.

| | |
|---|---|
| Wideband bandwidth | Between 540 kHz and 690 kHz (-3 dB) |
| Passband flatness (1) | 0.1 dB; DC to 150 kHz |

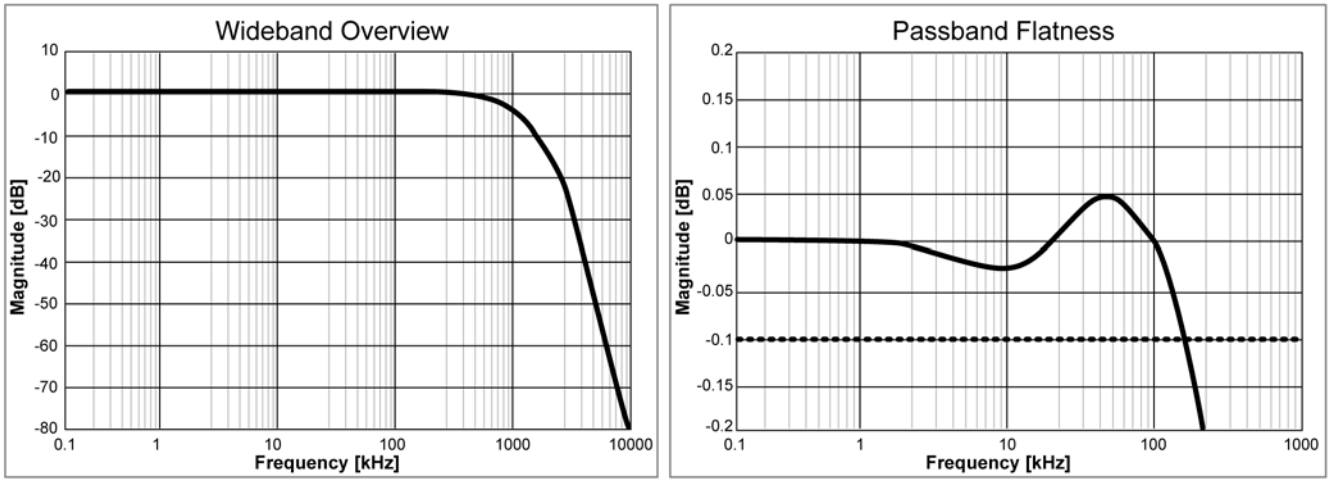



**Figure 1.2:** Typical Wideband Overview and Passband Flatness

(1) Measured using Fluke 5700 calibrator, DC normalized



Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

## Bessel IIR filter

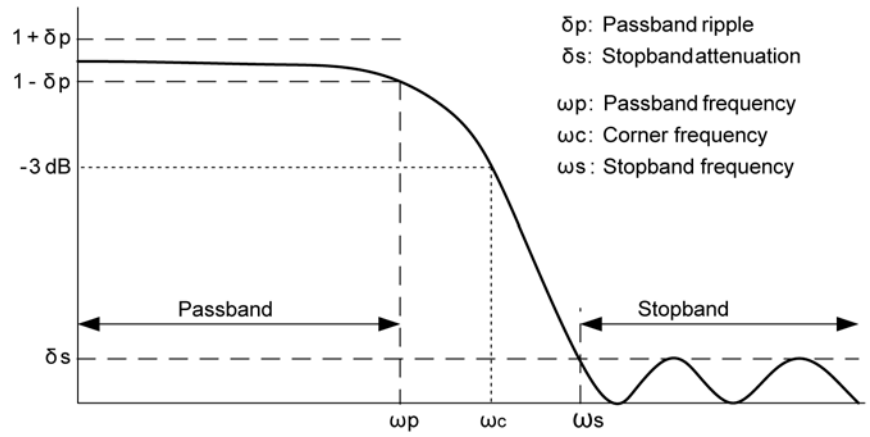



**Figure 1.3:** Digital Bessel IIR Filter

| When Bessel IIR filter is selected, this is always a combination of an analog Bessel anti alias filter and a digital Bessel IIR filter. | |
|---|---|
| Analog anti aliasing filter bandwidth | 220 kHz ± 20 kHz (-3 dB) |
| Analog anti aliasing filter characteristic | 7-pole Bessel, optimal step response |
| Bessel IIR filter characteristic | 6-pole Bessel style IIR |
| Bessel IIR filter user selection | Auto tracking to sample rate divided by: 10, 20, 40, 100<br>User selects divide factor from current sample rate, software then adjusts filter when sample rate is changed |
| Bessel IIR filter bandwidth (ωc) | Auto tracking the sample rate with the selected Bessel IIR filter user selection from 0.0125 Hz to 100 kHz |
| Bessel IIR passband flatness (ωp)(1) | 0.1 dB; DC to 20 kHz @ ωc = 100 kHz |
| Bessel IIR filter stop band attenuation (δs) | -60 dB<br>With Bessel IIR filter bandwidth selection ωc = 100 kHz a peak at -55 dB will occur between 500 kHz and 1 MHz due to limited analog anti alias filter amplitude reduction. At lower bandwidth selections the digital filter will reduce this peak to -60 dB |
| Bessel IIR filter roll-off | -36 dB/Octave |

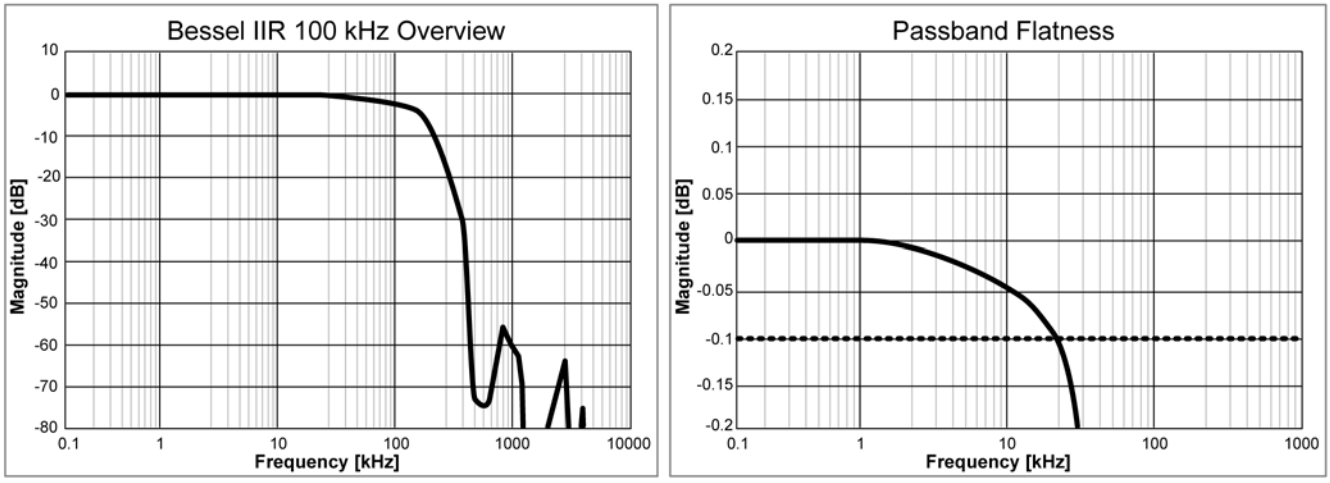



**Figure 1.4:** Typical Bessel IIR ωc = 100 kHz, Overview and Passband Flatness

(1) Measured using Fluke 5700 calibrator, DC normalized



Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

## FIR (Fc @ -0.1 dB) filter

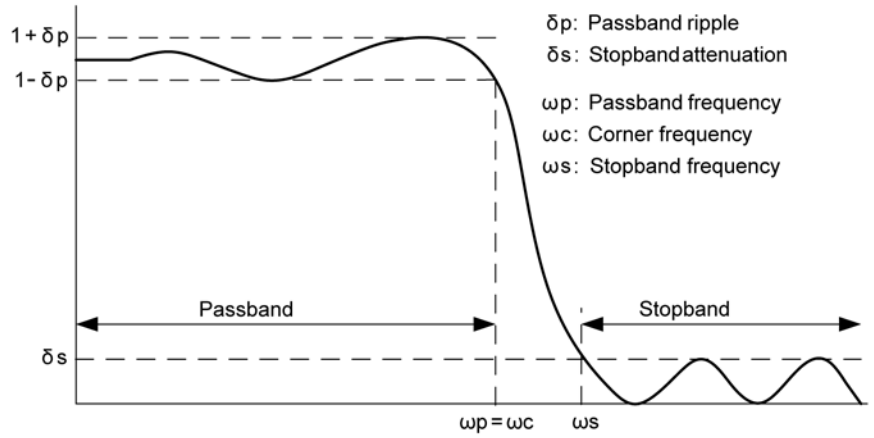



**Figure 1.5:** Digital FIR (Fc @ -0.1 dB) filter

When FIR (Fc @ -0.1 dB) filter is selected, this is always a combination of an analog Butterworth anti alias filter and a digital FIR (Fc @ -0.1 dB) filter.

| | |
|---|---|
| Analog anti aliasing filter bandwidth | 370 kHz ± 20 kHz (-3 dB) |
| Analog anti aliasing filter characteristic | 7-pole Butterworth, extended passband response |
| FIR (Fc @ -0.1 dB) filter characteristic | 12-pole FIR; FIR is a pure digital characteristic. Closest analog resemblance to elliptic filters, however FIR has both overshoot on step response and pre-shoot to step response. This means ringing on the signal starts before the step input starts and the ringing continues after the step input ends. |
| FIR (Fc @ -0.1 dB) filter user selection | Auto tracking to sample rate divided by: 4, 10, 20, 40<br>Divided by 40 not available for 1 MS/s & 500 kS/s sample rate<br>User selects divide factor from current sample rate, software then adjusts filter when sample rate is changed |
| FIR (Fc @ -0.1 dB) filter bandwidth (ωc) | Auto tracking the sample rate with the selected FIR (Fc @ -0.1 dB) filter user selection from 0.031 Hz to 250 kHz |
| FIR (Fc @ -0.1 dB) filter passband flatness (ωp) (1) | 0.1 dB; DC to filter bandwidth (ωc)<br>0.1 dB; DC to 125 kHz; FIR (Fc @ -0.1 dB) filter bandwidth selection ωc = 250 kHz, limited by the 370 kHz analog anti alias filter amplitude response. All other bandwidth selections not affected |
| FIR (Fc @ -0.1 dB) filter stopband attenuation (δs) | -60 dB<br>With FIR (Fc @ -0.1 dB) filter bandwidth selection ωc = 250 kHz a peak at -35 dB will occur between 500 kHz and 1 MHz due to limited analog anti alias filter amplitude reduction. At lower bandwidth selections the digital filter will reduce this peak to -60 dB |
| FIR (Fc @ -0.1 dB) filter roll-off | -72 dB/Octave |

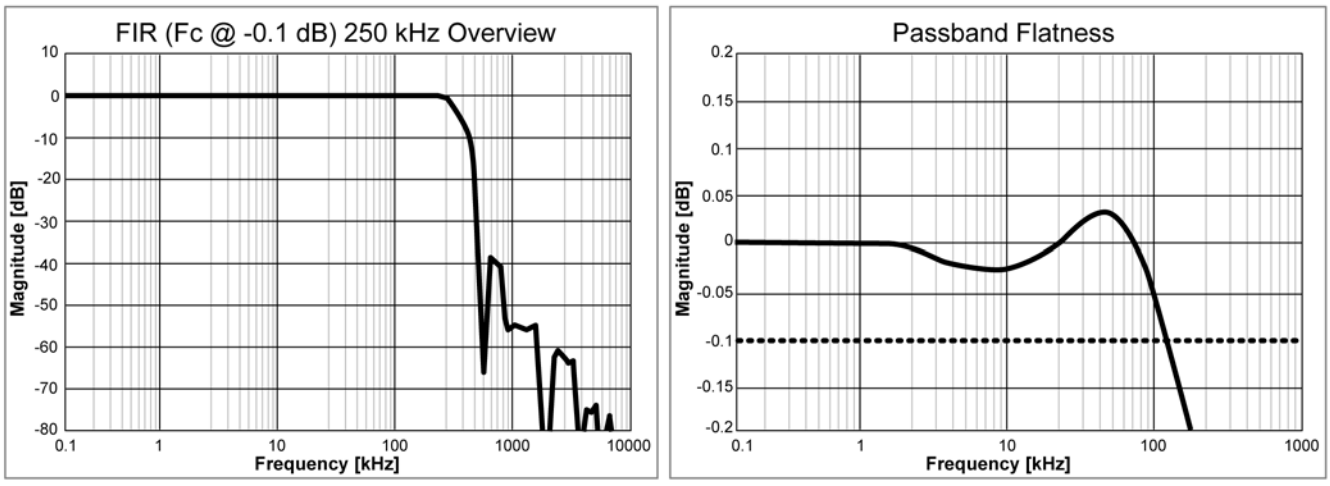



**Figure 1.6:** Typical FIR (Fc @ -0.1 dB) ωc = 250 kHz, Overview and Passband Flatness

(1) Measured using Fluke 5700 calibrator, DC normalized



Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

## FIR (Fc @ -3 dB) filter

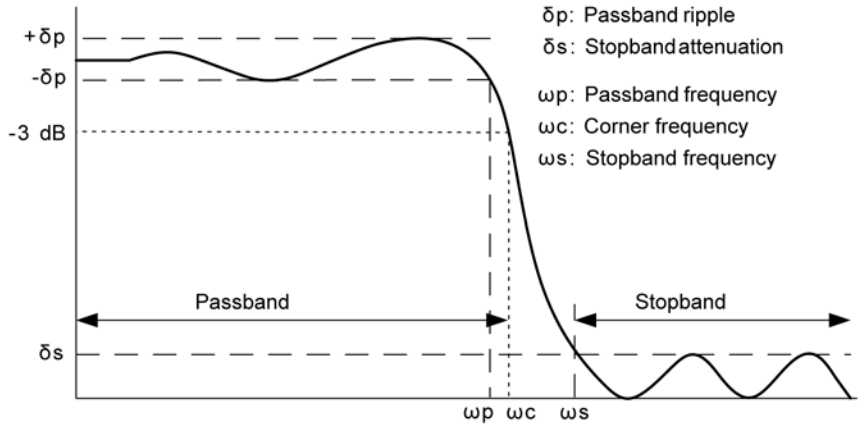



**Figure 1.7:** Digital FIR (Fc @ -3 dB) filter

When FIR (Fc @ -3 dB) filter is selected, this is always a combination of an analog Butterworth anti alias filter and a digital FIR (Fc @ -3 dB) filter. Adapted FIR filter with ωp reduced by a factor of ≈1.4 compared to the FIR (Fc @ -0.1 dB) filter. Supported by Perception V6.40 and higher.

| | |
|---|---|
| Analog anti aliasing filter bandwidth | 370 kHz ± 20 kHz (-3 dB) |
| Analog anti aliasing filter characteristic | 7-pole Butterworth, extended passband response |
| FIR (Fc @ -3 dB) filter characteristic | 12-pole FIR; FIR is a pure digital characteristic. Closest analog resemblance to elliptic filters, however FIR has both overshoot on step response and pre-shoot to step response. This means ringing on the signal starts before the step input starts and the ringing continues after the step input ends. |
| FIR (Fc @ -3 dB) filter user selection | Auto tracking to sample rate divided by: 4, 10, 20, 40<br>Divided by 40 not available for 1 MS/s & 500 kS/s sample rate<br>User selects divide factor from current sample rate, software then adjusts filter when sample rate is changed |
| FIR (Fc @ -3 dB) filter bandwidth (ωc) | Auto tracking the sample rate with the selected FIR (Fc @ -3 dB) filter user selection from 0.031 Hz to 250 kHz |
| FIR (Fc @ -3 dB) filter passband flatness (ωp) (1) | 0.1 dB; DC to ≈ωc/1.4 (Adapted FIR filter behavior)<br>0.1 dB; DC to 125 kHz; FIR (Fc @ -3 dB) filter bandwidth selection ωc = 250 kHz, limited by the 370 kHz analog anti alias filter amplitude response. All other bandwidth selections not affected |
| FIR (Fc @ -3 dB) filter stopband attenuation (δs) | -60 dB<br>With FIR (Fc @ -3 dB) filter bandwidth selection ωc = 250 kHz a peak at -35 dB will occur between 500 kHz and 1 MHz due to limited analog anti alias filter amplitude reduction. At lower bandwidth selections the digital filter will reduce this peak to -60 dB |
| FIR (Fc @ -3 dB) filter roll-off | -72 dB/Octave |

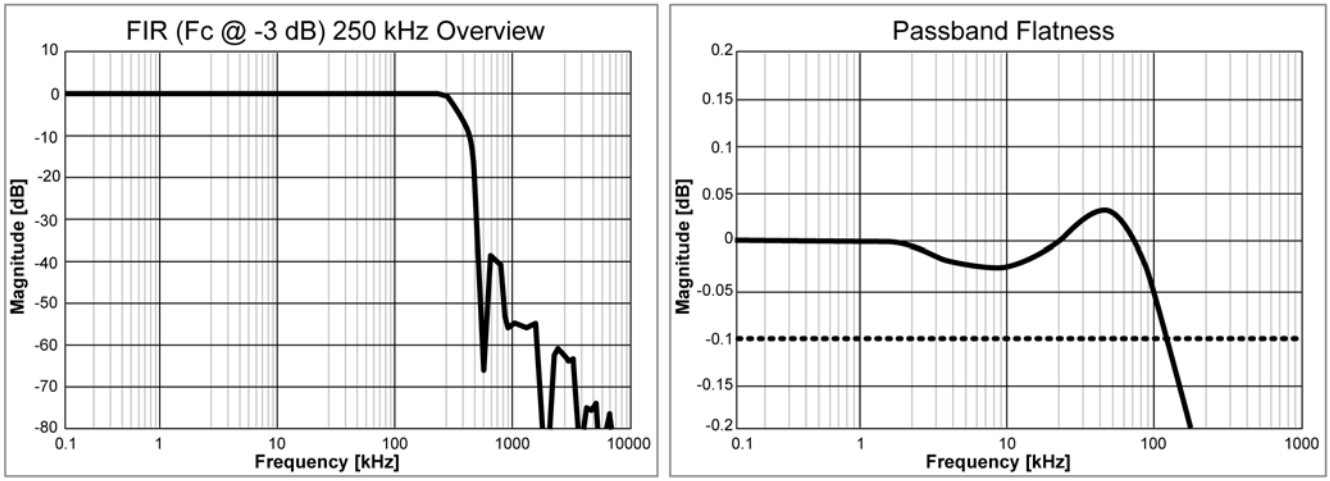



**Figure 1.8:** Typical FIR (Fc @ -3 dB) ωc = 250 kHz, Overview and Passband Flatness

(1) Measured using Fluke 5700 calibrator, DC normalized



Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

| Channel to Channel Phase Match | |
|---|---|
| Using different filter selections (Wideband/Bessel IIR/FIR/etc.) or different filter bandwidths will lead to phase mismatches between channels. | |
| Wideband | 100 kHz Sine |
| Channels on card | 0.7 deg (0.02 µs) |
| GN812 Channels within mainframe | 0.7 deg (0.02 µs) |
| Bessel IIR (Fc @ -3 dB), 100 kHz Filter frequency | |
| Channels on card | 0.7 deg (0.02 µs) |
| GN812 Channels within mainframe | 0.7 deg (0.02 µs) |
| FIR (Fc@ -0.1dB) and FIR (Fc @ -3 dB), 250 kHz Filter frequency | |
| Channels on card | 0.7 deg (0.02 µs) |
| GN812 Channels within mainframe | 0.7 deg (0.02 µs) |
| GN812 Channels across mainframes | Defined by synchronization method used (None, IRIG, GPS, Master/Slave) |

| On-board Memory | |
|---|---|
| Per card | 512 MB (256 MS) |
| Organization | Automatic distribution amongst enabled channels |
| Memory diagnostics | Automatic memory test when system is powered and not recording |
| Storage sample size | 16 bits, 2 bytes/sample |

| Digital Events/Timer/Counter | |
|---|---|
| Digital event inputs | Not supported |
| Digital event outputs | Not supported |
| Timer/Counter | Not supported |

| Triggering | |
|---|---|
| Channel trigger/qualifier | 1 fully independent per channel either trigger or qualifier |
| Pre- and post-trigger length | 0 to full memory |
| Trigger rate | 400 triggers per second |
| Manual trigger (Software) | Supported |
| External Trigger In | |
| Selection per card | User selectable On/Off |
| Active edge | Rising/Falling mainframe selectable, identical for all cards |
| Minimum pulse width | 500 ns |
| Delay | ± 1 µs + maximum 1 sample period (for decimal and binary time base) |
| Send to External Trigger Out | User can select to forward External Trigger In to the External Trigger Out BNC |
| External Trigger Out | |
| Selection per card | User selectable On/Off |
| Active level | High / Low / Hold High; selectable per mainframe, identical for all cards |
| Pulse width | High / Low : 12.8 µs<br>Hold high: Active from first mainframe trigger to end of recording<br>Pulse width created by mainframe |
| Delay | 516 µs ± 1 µs + maximum 1 sample period using decimal time base<br>504 µs ± 1 µs + maximum 1 sample period using binary time base |
| Cross channel triggering | |
| Channels on card | Logical OR; Analog triggers of all channels<br>Logical AND; Qualifiers of all channels |
| Cards in mainframe | User selectable through system trigger bus<br>Selections: Send/Receive/Transceive (Send & Receive) |



Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

## Triggering

| | |
|---|---|
| System trigger bus | |
| Connections | 3 System trigger busses connecting all cards within mainframe<br>1 Master/Slave bus connecting all cards within mainframe and connecting all mainframes when using Master/Slave option |
| Operation | Logical OR of all triggers of all cards<br>Logical AND of all qualifiers of all cards |
| Analog channel trigger levels | |
| Levels | Maximum 2 level detectors |
| Resolution | 16 bit (0.0015 %); for each level |
| Direction | Rising/Falling; Single direction control for both levels based on selected mode |
| Hysteresis | 0.1 to 100 % of Full Scale; defines the trigger sensitivity |
| Pulse detect/reject | Disable/Detect/Reject selectable. Maximum pulse width 65 535 samples |
| dY/dT conversion | dY : 16 bit (0.0015 %) for both levels<br>dT : 1 to 1023 samples. dT setting shared for both levels |
| Analog channel trigger modes | |
| Basic | POS or NEG crossing; single level |
| Dual level | One POS and one NEG crossing; Two individual levels, OR-ed |
| Window | Arm/trigger and a disarm level; Trigger on peak-level changes in a uni-polar signal |
| Dual Window | Arm/trigger/disarm per level; Trigger on peak-level changes in a bi-polar signal |
| Sequential | One arm and one trigger level; eliminate false triggering due to noise or hysteresis |
| Analog channel qualifier modes | |
| Basic | Above or below level check. Enable/disable trigger with single level |
| Dual (level) | Outside or within bounds check. Enable/disable trigger with dual level |
| Trigger holdoff | Disable channel trigger for 1 to 65 535 samples after trigger detected<br>Maximum holdoff time sample rate dependent |
| Interval timer | |
| Modes | Less then, trigger when rate is too low<br>More then, trigger when rate is too high<br>Between, trigger when rate between lower and upper limit<br>Not between, trigger when rate is not between lower and upper limit |
| Interval timers | Start timer and width Timer |
| Timer value | 1 to 65 535 samples |
| Event counter | Counted channel trigger events before card trigger is activated<br>1 to 256 trigger events |

## Alarm Output

| | |
|---|---|
| Selection per Card | User selectable On/Off |
| Alarm modes | Basic or Dual |
| Basic | Above or below level check |
| Dual (level) | Outside or within bounds check |
| Alarm levels | |
| Levels | Maximum 2 level detectors |
| Resolution | 16 bit (0.0015 %); for each level |
| Alarm output | Active during valid alarm condition, output supported through mainframe |
| Alarm output delay | 515 µs ± 1 µs + maximum 1 sample period using decimal timebase<br>503 µs ± 1 µs + maximum 1 sample period using binary timebase |

## Real-Time Analysis

| | |
|---|---|
| StatStream®<br>Patent Number : 7,868,886 | Each channel includes real-time extraction of Maximum, Minimum, Mean, Peak-to-Peak, Standard Deviation and RMS values<br>Supports the real-time Live scrolling and scoping waveform displays as well as the real-time meters during recording<br>Supports the fast displaying and zooming within extremely large recordings<br>Supports the fast calculation of statistical channel information |



Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

| Acquisition Modes | |
|---|---|
| Single sweep | Triggered acquisition to on-board memory without sample rate limitations; for single transients or intermittent phenomena. |
| Multiple sweeps | Triggered acquisition to on-board memory without sample rate limitations; for repetitive transients or intermittent phenomena. |
| Slow fast sweep | Identical to single sweep acquisition with additional support for fast sample rate switches during the post trigger segment of the slow rate single sweep settings. |
| Continuous | Direct storage to PC or mainframe hard disk without file size limitations; triggered or un-triggered; for long duration recorder type applications. |
| Dual | Combination of Multiple sweeps and Continuous; recorder type streaming to hard disk with simultaneously triggered sweeps in on-board memory. |

| Single Sweep | | |
|---|---|---|
| Sweep memory | 252 MS; used by enabled channels only | |
| Maximum sweep length | 252 MS divided by number of enabled channels | |
| | 1 channel enabled | 8 channels enabled |
| | 252 MS/channel | 31 MS/channel |
| Maximum sample rate | 1 MS/s per channel, no aggregate rate limitations | |
| Pre-trigger segment | 0 % to 100 % of selected sweep length<br>If trigger occurs before pre-trigger segment is recorded, pre-trigger segment is truncated to recorded data only | |
| Delayed trigger | Maximum 1000 seconds after a trigger occurred. Sweep is recorded immediately after delayed trigger time with 100 % post trigger after this time point | |
| Sweep stretch | User Selectable On/Off<br>When enabled any new trigger event occurring in the post-trigger segment of the sweep will restart the post-trigger length. If upon the detection of a new trigger, the extended post-trigger doesn't fit within the sweep memory, sweep stretch will not happen. Maximum sweep stretch rate 1 sweep stretch per 2.5 ms | |

| Multiple Sweeps | | |
|---|---|---|
| Sweep memory | 252 MS; used by enabled channels only | |
| Maximum sweep length | 252 MS divided by number of enabled channels | |
| | 1 channel enabled | 8 channels enabled |
| | 252 MS/channel | 31 MS/channel |
| Maximum sample rate | 1 MS/s per channel, no aggregate streaming rate limitations | |
| Pre-trigger segment | 0 % to 100 % of selected sweep length<br>If trigger occurs before pre-trigger segment is recorded, pre-trigger segment is truncated to recorded data only | |
| Delayed trigger | Maximum 1000 seconds after a trigger occurred. Sweep is recorded immediately after delayed trigger time with 100 % post trigger after this time point | |
| Maximum number of sweeps | 200 000 per recording (1) | |
| Maximum sweep rate | 400 sweeps per second | |
| Sweep re-arm time | Zero re-arm time, sweep rate limited to 1 sweep per 2.5 ms | |
| Sweep stretch | User Selectable On/Off<br>When enabled any new trigger event occurring in the post-trigger segment of the sweep will restart the post-trigger length. If upon the detection of a new trigger, the extended post-trigger doesn't fit within the sweep memory, sweep stretch will not happen. Maximum sweep stretch rate 1 sweep stretch per 2.5 ms. | |
| Sweep storage | Sweep storage starts immediately after the trigger for this sweep is detected. Sweep memory becomes available for reuse as soon as storage of the entire sweep for all enabled channels of this card has been completed. Sweeps will be stored one by one starting with the first recorded sweep. | |
| Sweep storage rate | Determined by total number of selected channels and mainframes, mainframe type, Ethernet speed, PC storage medium and other PC parameters; See mainframe datasheet. | |
| Exceeding sweep storage rate | Trigger event markers are stored in recording, no sweep data stored. New sweep data recorded as soon as enough internal memory is available to capture a full sweep. | |

(1) Specified for Perception V6.20 or higher



Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

| Slow Fast Sweep | | |
|---|---|---|
| Maximum number of sweeps | 1 | |
| Sweep memory | 252 MS; used by enabled channels only | |
| Maximum sweep length | 252 MS divided by number of enabled channels | |
| | 1 channel enabled | 8 channels enabled |
| | 252 MS/channel | 31 MS/channel |
| Maximum fast sample rate | 1 MS/s per channel, no aggregate rate limitations | |
| Maximum slow sample rate | Fast sample rate divided by 2, or 50 kS/s per channel, whichever is the smallest sample rate | |
| Maximum sample rate switches | 400 sample rate switches per second, 200 000 switches maximum, switching stops when sweep ends | |

| Continuous | | |
|---|---|---|
| Continuous modes supported | Standard, Circular recording, Specified time and Stop on trigger | |
| Standard | User starts and stops recording. Automatic recording stop on storage media full. | |
| Circular recording | User specified recording length on storage media. All recorded data stores as quickly as possible on selected storage media. As soon as selected history time is reached older recorded data is overwritten. Recording can be stopped by user, or any system trigger. | |
| Specified time | Automatic recording stop after user specified time or on storage media full | |
| Stop on trigger | Automatic recording stop after any system trigger or on storage media full | |
| Continuous FIFO memory | 252 MS; used by enabled channels to optimize the continuous streaming rate | |
| Maximum sample rate | 1 MS/s per channel | |
| Maximum streaming rate | 8 MS/s (16 MB/s) when all channels enabled | |
| | 1 channel enabled | 8 channels enabled |
| | 1 MS/s (2 MB/s) | 8 MS/s (16 MB/s) |
| Maximum recording time | Until storage media filled, or user selected time or unlimited using circular recording | |
| Maximum aggregate streaming rate per mainframe | Determined by mainframe, Ethernet speed, PC storage medium and other PC parameters; See mainframe datasheet for details. | |
| Exceeding aggregate streaming rate | When using a streaming rate selected higher than the aggregate streaming rate of the system, the continuous memory will act as a FIFO. As soon as this FIFO fills up, the recording suspends (temporarily no data is recorded). During this period, the internal FIFO memory is transferred to storage medium. When internal memory is completely empty again, the recording automatically resumes. User notifications are added to recording file for post recording identification of storage overrun. (1) | |

(1) Specified for Perception V6.20 or higher



Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

| Dual [1] | | |
|---|---|---|
| **Dual Sweep Specifications** | | |
| Maximum sample rate | 1 MS/s per channel, no aggregate streaming rate limitations | |
| Dual sweep memory | 80 % of available channel memory<br>200 MS; used by enabled channels only | |
| Pre-trigger segment | 0 % to 100 % of selected sweep length<br>If trigger occurs before pre-trigger segment is recorded, pre-trigger segment is truncated to recorded data only | |
| Delayed trigger | Maximum 1000 seconds after a trigger occurred. Sweep is recorded immediately after delayed trigger time with 100 % post trigger after this time point. | |
| Maximum sweep length | 200 MS divided by number of enabled channels | |
| | 1 channel enabled | 8 channels enabled |
| | 200 MS/channel | 25 MS/channel |
| Maximum number of sweeps | 200 000 per recording [1] | |
| Maximum sweep rate | 400 triggers per second | |
| Sweep re-arm time | Zero re-arm time, sweep rate limited to 1 sweep per 2.5 ms | |
| Sweep stretch | User Selectable On/Off<br>When enabled any new trigger event occurring in the post-trigger segment of the sweep will restart the post-trigger length. If upon the detection of a new trigger, the extended post-trigger doesn't fit within the sweep memory, sweep stretch will not happen. Maximum sweep stretch rate 1 sweep stretch per 2.5 ms | |
| Sweep storage | In dual mode the storage of the continuous data is prioritized above the storage of the sweep data. If enough storage rate is available, the sweep storage starts immediately after the trigger for this sweep is detected. Sweep memory becomes available for reuse as soon as storage of the entire sweep for all enabled channels of this card has been completed. Sweeps will be stored one by one starting with the first recorded sweep. | |
| Sweep storage rate | Determined by selected continuous sample rate, total number of channels and mainframes, mainframe type, Ethernet speed, PC storage medium and other PC parameters. See mainframe datasheet for details. | |
| Exceeding sweep storage rate | Continuous recorded data not stopped, trigger events are stored in recording, no new sweep data stored. New sweep recorded as soon as enough internal memory is available to capture a full sweep when trigger occurs. | |
| **Dual Continuous Specifications** | | |
| Continuous FIFO memory | 50 MS; used by enabled channels to optimize the continuous streaming rate | |
| | 1 channel enabled | 8 channels enabled |
| | 50 MS/channel | 6.25 MS/channel |
| Maximum sample rate | Sweep sample rate divide by 2 or 50 kS/s per channel, whichever is the smallest sample rate | |
| Maximum streaming rate | 50 kS/s (100 kB/s) per enabled channel | |
| | 1 channel enabled | 8 channels enabled |
| | 50 kS/s (100 kB/s) | 400 kS/s (800 kB/s) |
| Maximum recording time | Until storage media filled, all recorded data will be stored including sweeps, or user selected time | |
| Maximum aggregate streaming rate per mainframe | Determined by mainframe, Ethernet speed, PC storage medium and other PC parameters. See mainframe datasheet for details.<br>When exceeding average aggregate streaming rate, sweep storage speed is automatically reduced to increase continuous streaming rate, until sweep storage completely stops. | |
| Exceeding aggregate storage rate | When using a streaming rate selected higher than the aggregate streaming rate of the system, the continuous memory will act as a FIFO. As soon as this FIFO fills up, the recording suspends (temporarily no data is recorded). During this period, the internal FIFO memory is transferred to storage medium. When internal memory (Continuous and Sweep memory) is completely empty again, the recording automatically resumes. User notifications are added to recording file for post recording identification of storage overrun. [1] | |

(1) Specified for Perception V6.20 or higher



Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

## Environmental Specifications

| | |
|---|---|
| Temperature Range | |
| Operational | 0 °C to +40 °C (+32 °F to +104 °F) |
| Non-operational (Storage) | -25 °C to +70 °C (-13 °F to +158 °F) |
| Thermal protection | Automatic thermal shutdown at 85 °C (+185 °F) internal temperature<br>User warning notifications at 75 °C (+167 °F) (Supported by Perception V6.30 or higher) |
| Relative humidity | 0 % to 80 %; non-condensing; operational |
| Protection class | IP20 |
| Altitude | Maximum 2000 m (6562 feet); operational |
| Shock: IEC 60068-2-27 | |
| Operational | Half-sine 10 g/11 ms; 3-axis, 1000 shocks in positive and negative direction |
| Non-operational | Half-sine 25 g/6 ms; 3-axis, 3 shocks in positive and negative direction |
| Vibration: IEC 60068-2-34 | |
| Operational | 1 g RMS, ½ h; 3-axis, random 5 to 500 Hz |
| Non-operational | 2 g RMS, 1 h; 3-axis, random 5 to 500 Hz |
| Operational Environmental Tests | |
| Cold test IEC60068-2-1 Test Ad | -5 °C (+23 °F) for 2 hours |
| Dry heat test IEC-60068-2-2 Test Bd | +40 °C (+104 °F) for 2 hours |
| Damp heat test IEC60068-2-3 Test Ca | +40 °C (+104 °F), humidity >93 % RH for 4 days |
| Non-Operational (Storage) Environmental Tests | |
| Cold test IEC-60068-2-1 Test Ab | -25 °C (-13 °F) for 72 hours |
| Dry heat test IEC-60068-2-2 Test Bb | +70 °C (+158 °F) humidity <50 % RH for 96 hours |
| Change of temperature test IEC60068-2-14 Test Na | -25 °C to +70 °C (-13 °F to +158 °F)<br>5 cycles, rate 2 to 3 minutes, dwell time 3 hours |
| Damp heat cyclic test IEC60068-2-30 Test Db variant 1 | +25 °C/+40 °C (+77 °F/+104 °F), humidity >95/90 % RH<br>6 Cycles, cycle duration 24 hours |

## Harmonized Standards for CE Compliance, according to the following directives

Low voltage directive (LVD): 2006/95/EC
Electromagnetic compatibility directive (EMC): 2004/108/EC

| | |
|---|---|
| **Electrical Safety** | |
| EN 61010-1 (2010) | Safety requirements for electrical equipment for measurement, control, and laboratory use - General requirements |
| EN 61010-2-030 (2010) | Particular requirements for testing and measuring circuits |
| **Electromagnetic Compatibility** | |
| EN 61326-1 (2006) | Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements |
| **EMISSION** | |
| EN 55011 | Industrial, scientific and medical equipment - Radio-frequency disturbance characteristics - Limits and methods of measurement<br>Conducted disturbance: class B; Radiated disturbance: class A |
| EN 61000-3-2 | Limits for harmonic current emissions: class D |
| EN 61000-3-3 | Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems |
| **IMMUNITY** | |
| EN 61000-4-2 | Electrostatic discharge immunity test (ESD);<br>contact discharge ± 4 kV/air discharge ± 8 kV: performance criteria B |
| EN 61000-4-3 | Radiated, radio-frequency, electromagnetic field immunity test;<br>80 to 2700 MHz using 10 V/m, 1000 Hz AM: performance criteria A |
| EN 61000-4-4 | Electrical fast transient/burst immunity test<br>Mains ± 2 kV using coupling network. Channel ± 2 kV using capacitive clamp: performance criteria B |
| EN 61000-4-5 | Surge immunity test<br>Mains ± 0.5 kV/± 1 kV Line-Line and ± 0.5 kV/± 1 kV/± 2 kV Line-earth Channel ± 0.5 kV/± 1 kV using coupling network: performance criteria B |
| EN 61000-4-6 | Immunity to conducted disturbances, induced by radio-frequency fields<br>0.15 to 80 MHz, 1000 Hz AM; mains - 10 Vrms, using clamp; channel - 3 Vrms, using clamp: performance criteria A |
| EN 61000-4-11 | Voltage dips, short interruptions and voltage variations immunity tests<br>Dips: performance criteria A; Interruptions: performance criteria C |



Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

## Ordering Information[1]

| Article | | Description | Order No. |
|---|---|---|---|
| Basic1M ISO |  | 8 Channel, 16 bits,1 MS/s, ± 1 V to ± 50 V input range, 512 MB RAM (32 MS/channel), isolated, unbalanced differential, with single isolated BNC for each channel | 1-GN812-2 |

(1) All GEN series systems are intended for exclusive professional and industrial use.

©Hottinger Baldwin Messtechnik GmbH. All rights reserved.
All details describe our products in general form only.
They are not to be understood as express warranty and do not constitute any liability whatsoever.

**Hottinger Baldwin Messtechnik GmbH**
Im Tiefen See 45 • 64293 Darmstadt • Germany
Tel. +49 6151 803-0 • Fax: +49 6151 803-9100
E-mail: info@hbm.com • www.hbm.com

measure and predict with confidence

B2634-2.0 en

Artisan Technology Group - Quality Instrumentation ... Guaranteed | (888) 88-SOURCE | www.artisantg.com

**Artisan Technology Group** is an independent supplier of quality pre-owned equipment

## Gold-standard solutions

Extend the life of your critical industrial, commercial, and military systems with our superior service and support.

## We buy equipment

Planning to upgrade your current equipment? Have surplus equipment taking up shelf space? We'll give it a new home.

## Learn more!

Visit us at **artisantg.com** for more info on price quotes, drivers, technical specifications, manuals, and documentation.

Artisan Scientific Corporation dba Artisan Technology Group is not an affiliate, representative, or authorized distributor for any manufacturer listed herein.

We're here to make your life easier. How can we help you today?

(217) 352-9330 | sales@artisantg.com | artisantg.com

ARTISAN® TECHNOLOGY GROUP