Data sheet

GEN series
GEN7t

Transient Recorder and Data Acquisition System

Features and Benefits

- **Standalone desktop mainframe**
- **Seven slots for acquisition cards**
- **Accepts any mix of GEN DAQ acquisition cards**
- **Up to 224 analog channels**
- **100 MB/s continuous streaming rate**
- **1 GBit optical Ethernet**
- **10 Gbit optical Ethernet with 200 MB/s continuous streaming rate**
- **IRIG/GPS time synchronization**
- **Master/Slave synchronization**

GEN7t is a robust portable transient recorder and data acquisition system and part of the proven GEN DAQ series data acquisition systems. GEN7t comes with a high-speed standard 1 Gbit Ethernet interface capable of streaming recorded data directly to the PC at data rates up to 100 MB/s. Optional 1 Gbit Optical Ethernet allows isolated control of the mainframe as well as cable lengths up to 10 km while maintaining the full streaming performance. The optional 10 Gbit optical Ethernet interface raises the streaming rate to 200 MB/s to allow higher streaming speed.

When more reliable or distributed storage of recorded data is required the GEN7t mainframe supports a built-in Solid State Disk or can directly store recorded data on a Network Attached Storage (NAS) device.
To synchronize the absolute time to other systems the GEN7t supports the optional IRIG and IRIG/GPS card while synchronizing multiple GEN DAQ systems can be done using the optional Master/Slave card.
GEN7t is configured and controlled using Perception software. This combination results in a sophisticated instrument for ultra-fast recording, analysis and reporting.

HBM

GEN7t Block Diagram

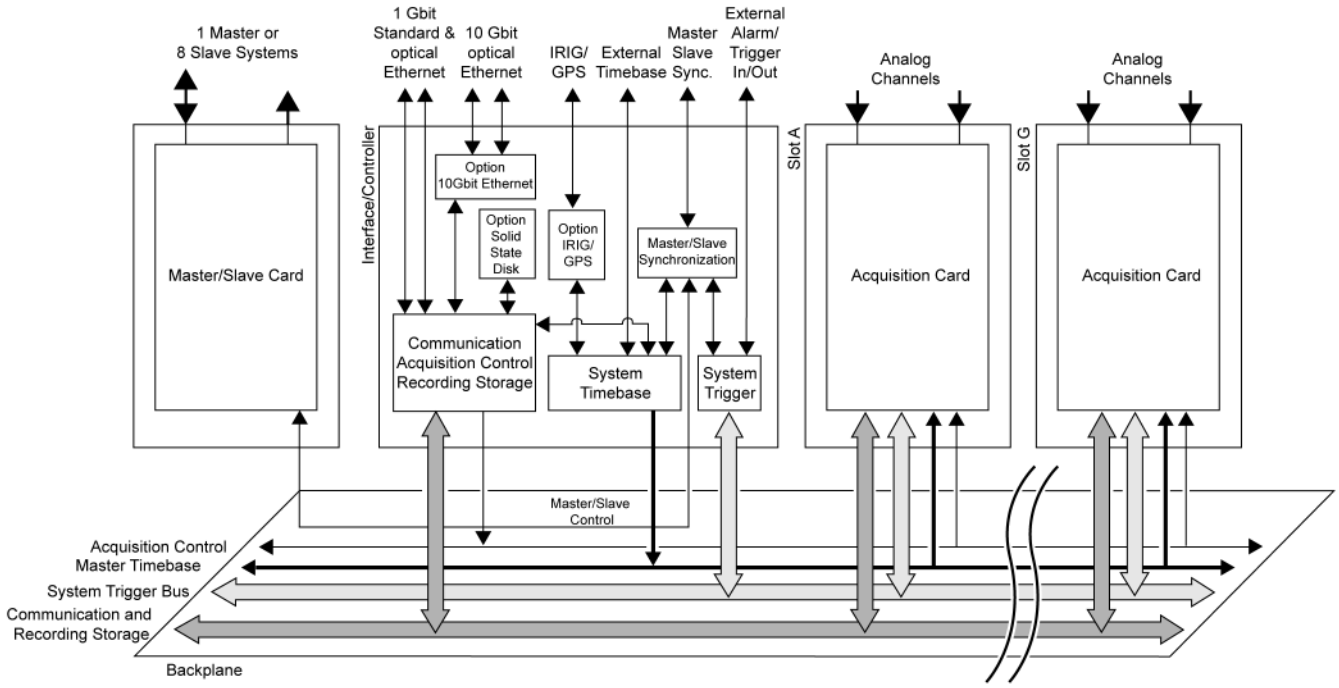


Figure 1.1: Block Diagram GEN7t Mainframe

GEN7t System

Interface/Controller Module
Standard integrated in every GEN DAQ mainframe creates central time base and synchronization.

Acquisition Slots
Unused slots must be covered using the GEN DAQ blank panel. This closes the mainframe front panels for EMC/EMI and safety compliance but also regulates the internal airflow for correct cooling of the acquisition system.

Number of acquisition card slots	7
Acquisition cards	All slots support any combination of GEN DAQ acquisition boards
Master/Slave card	1; dedicated Master/Slave slot
Digital Event/Timer/Counter connector	0(1)
Thermal control	Every acquisition board and the Interface/Controller module monitors its own temperatures and status. This is used to regulate FAN speeds and reduce noise while optimizing airflow and power consumption.
Calibration	Any changes to the acquisition system configuration, may change its internal thermal gradients. As accurate calibration relies on a steady and repeatable thermal environment, calibration will be void if changes are made in the configuration.

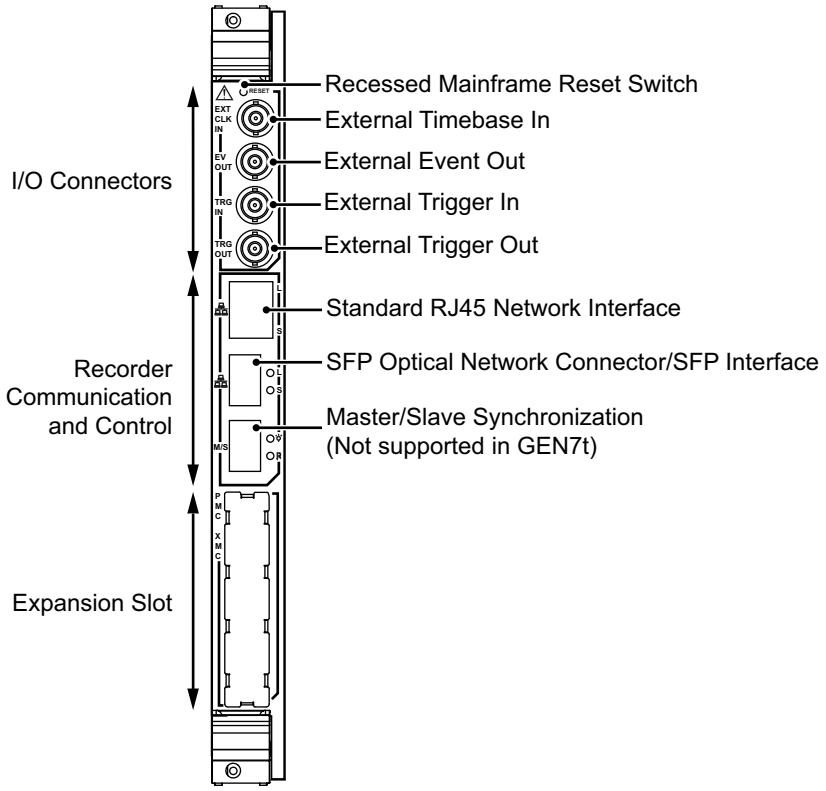
Master/Slave slot
Dedicated Master/Slave slot to add one optional Master/Slave card.

(1) Digital Event/Timer/Counter supported using the Marker1M card (1-GN6470-2).

Power

Power Inlet	90-275 V AC; 47-63 Hz
Total Power of unit (maximum)	450 VA

IM2 Interface/Controller Module



Systems shipped before January 2012, are equipped with IM1 Interface/Controller Module.

Recorder Communication and Control	
Network Interface	
Standard 1 Gbit/s Ethernet	1 Gbit/s, Ethernet, Cat 5e UTP (RJ-45 connector)
Optional 1 Gbit/s Ethernet, optical	1 Gbit/s, optical SFP module using LC connector 850 nm optical wavelength, MultiMode fiber cable, 500 m maximum length or 1310 nm optical wavelength, SingleMode fiber cable, 10 km maximum length. Uses dedicated SFP interface
Optional 10 Gbit/s Ethernet, optical	Maximum 2 interfaces of 10 Gbit/s optical SFP+ modules using LC connectors 850 nm optical wavelength, MultiMode fiber cable, 500 m maximum length and/or 1310 nm optical wavelength, SingleMode fiber cable, 10 km maximum length Uses the XMC/PMC expansion slot
TCP/IP	
Protocol	IPV4
Address setup	DHCP/Auto IP or fixed IP
DHCP setup	When DHCP fails Auto IP setup is used similar to Windows® PC's
Gateway setup	Gateway setup supported for control through VPN and/or Internet
Maximum Transfer Speed	
1 Gbit/s network to a remote PC	100 MB/s(1)
10 Gbit/s network to a remote PC	200 MB/s(1)
CPU and Software	
CPU	ATOM based
Operating System	Linux(2)

(1) Tested using several combinations of acquisition cards using a Windows® 7 PC with Intel i7 CPU and SSD RAID drive with write speeds exceeding 700 MB/s sustained.

(2) Linux GPL open source code can be downloaded on HBM website.

Timebase and Master/Slave Synchronization	
Central Timebase[1]	
Accuracy	± 3.5 ppm; aging after 10 years ± 10 ppm[2]
Clock base	Binary, Decimal or External
Master/Slave Synchronization	Supported by the optional Master/Slave card Master/Slave Synchronization connector only supported by GEN2i mainframes

(1) The Interface/Controller module provides a central timebase for all acquisition cards.

(2) Systems shipped before January 2012: ± 30 ppm.

I/O Connectors	
External Timebase In	TTL compatible
Pulse width	100 ns min.
Maximum frequency	5 MHz
Active edge	Rising
Rounding resolution	4.01 µs; 250 kS/s and 20 kS/s acquisition cards
	1.01 µs; 1 MS/s and 200 kS/s acquisition cards
	510 ns; 2 MS/s and 200 kS/s (GN611) acquisition cards
	60 ns; 100 MS/s and 25 MS/s acquisition cards
Input to sample moment delay	350 – 400 ns, plus maximum 1 full rounding resolution
Input overvoltage protection	± 30 V DC
External Trigger In	TTL compatible
Resolution	50 ns
Minimum pulse width	500 ns
Active edge	Selectable rising or falling
Input overvoltage protection	± 30 V DC
Delay[1]	± 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
Top Dead Center Rotational input	Used to indicate top dead center in rotational external timebase
External Trigger Out	TTL compatible
Active level	Selectable High/Low/Hold High
Pulse width	High or Low selected: 12.8 µs Hold High selected : Active from first trigger to end of recording
Output impedance	50 Ω
Short circuit protected	Continuous
Delay[1]	516 ± 1 µs + maximum 1 sample period when Clock base: decimal, Filter: wideband[2]
	504 ± 1 µs + maximum 1 sample period when Clock base: binary, Filter: wideband[2]
External Event Out	TTL compatible
Function	Selectable Alarm or Recording Active output
Active level	Selectable High/Low for Alarm output Recording active High output
Pulse width	Alarm: Active from start of alarm condition until condition ends Recording: Active until recording stops
Output impedance	50 Ω
Short circuit protected	Continuous
Delay[1]	515 ± 1 µs + maximum 1 sample period when Clock base: decimal, Filter: wideband[2]
	503 ± 1 µs + maximum 1 sample period when Clock base: binary, Filter: wideband[2]

(1) Delays are equal for all acquisition cards.

(2) If analog and/or digital filter is used extra delay will be added depending on type of filter and signal frequency.

Local Storage options[1]

Solid State Disk[2]
Built inside the GEN DAQ series mainframes to optimally secure data storage. Recorded data can be copied to permanent archive using Perception software.

Size	300 GByte
Maximum continuous storage speed	50 MB/s[3], limited by PNRF recording file management on the Interface/Controller module
Maximum sweep storage speed	Depends on sweep length and number of channels used
File system	Linux EXT4
Connection	SATA300
Location	Built-in not removable, qualified by HBM

iSCSI Storage
Ethernet based SCSI connections to external disks supporting iSCSI; Supports external NAS disks (Network Attached Storage).
Embedded Linux from GEN Series Interface/Controller Module directly reads and writes data to the iSCSI disk.

Protocols used	RFC 3720 iSCSI initiator RFC 3721 naming and discovery
Name format structure	iqn.yyyy-mm.domain:device.ID
Optional authorization	CHAP, username and password negotiation
Maximum continuous storage speed	40 MB/s[3][4], limited by PNRF recording file management and iSCSI software overhead on the Interface/Controller Module
Maximum sweep storage speed	Depends on sweep length and number of channels used
File system	Linux EXT4 (not directly readable by Windows® without using 3rd party tools). Recorded data can be read by Perception using a GEN DAQ mainframe connected to the iSCSI drive or any Linux system connected to the iSCSI drive using a SAMBA server to allow Windows® access.
Disk partition size	Maximum 2 TB disk volume
GEN DAQ series access	Exclusive iSCSI access required
Windows® access	Create network share by using Linux SAMBA server

(1) Not supported by Perception instrument panel software.

(2) Denotes an option that requires factory installation.

(3) Tested using several combinations of acquisition cards.

(4) Appropriate NAS server required to keep up with maximum data rate.
Tested using Synology DS212+ and RS3412 using 1 Gbit/s or 10 Gbit/s Ethernet links.

Expansion Slot options (1 slot available)

IRIG	IRIG A and B, AM modulated or DCLS (DC level shifted)
IRIG/GPS	IRIG A and B, AM modulated or DCLS (DC level shifted) GPS, comes with GPS antenna and 15 m (590") GPS cable (used for time synchronization only)
10 Gbit/s Ethernet	Maximum 2 interfaces of 10 Gbit/s SFP+ modules using LC connectors

IRIG, IRIG/GPS (options, to be ordered separately)

IRIG[1] Specification valid for IRIG and IRG/GPS option	
Time Code Translator (Input)	
Time Code formats	IRIG A and IRIG B, IEEE 1344 compliant AM Modulated or DC level shift (DCLS)
Modulation ratio	3:1 to 6:1
Input amplitude	500 mV to 5 V Peak-to-Peak
Input impedance	>10 KΩ
Time Code Output	
Time Code format	IRIG B, IEEE 1344 compliant
Modulation ratio	3:1
Output amplitude	4 V Peak-to-Peak (fixed) into 50 Ω
DC level shift	TTL/CMOS
AM modulated input/output connectors	2 SMB sockets; one for input and one for output
DCLS connector	Micro DP, 15-pin; some signals internally linked to Interface/Controller Module
Time synchronization accuracy	<5 µs modulated, <1 µs (DCLS)
GEN DAQ series functions	Capture start of recording time Synchronize Master Time Base oscillator frequency
Time required to full synchronization after IRIG signal detected	
No recording active	1 to 5 minutes
Recording or pause active	1 to 5 minutes plus 25 s per ms recording time deviation from IRIG time
User notifications while recording	Time marks on IRIG signal lost/restored and IRIG time synchronized
Short term tracking stability	5.0 E-8
Long term tracking “Fly-wheeling”	5.0 E-7
GPS[1] Only supported by IRG/GPS option	
GPS connector	Micro DP, 9-pin
GPS antenna	1; included
GPS antenna cable	50 m (164 feet); included
Time synchronization accuracy	<1 µs
GEN DAQ series functions	Capture start of recording time Synchronize Master Time Base oscillator frequency
GPS localization time	2 to 15 minutes
Time required to full synchronization after GPS localization completed	
No recording active	1 to 10 minutes
Recording or pause active	1 to 10 minutes plus 25 s per ms recording time deviation from IRIG time
User notifications while recording	Time marks on GPS satellites lost/restored and GPS time synchronized
Short term tracking stability	5.0 E-8
Long term tracking “Fly-wheeling”	5.0 E-7

(1) Requires factory installation

Master/Slave Card (option, to be ordered separately)	
Maximum number of mainframes	9; one Master controlling up to eight Slaves
LED signaling	Optical link synchronized, not connected, function disabled
Connection topology	Star connection; each Slave directly connected to Master by individual cables
Cable type	850 nm Multi Mode (50/125 µm) optical cable (single 3 m (10 feet) cable included)
Maximum cable length	500 m (1640 feet)
Cable length delay compensation	Automatic delay compensation supported
Time required to full synchronization after Master/Slave signal detected	
No recording active	1 to 5 minutes
Recording or pause active	1 to 5 minutes plus 25 s per ms recording time deviation from Master time
User notifications while recording	Time marks on Master/Slave signal lost/restored and Master/Slave time synchronized
Basic Synchronization	
First sample	Synchronizes the first sample in the recording for each mainframe
Synchronized timebase	Prevents frequency drift of the sample rates within each mainframe
Channel trigger exchange	Synchronously exchanges every channel trigger connected to the Master/Slave trigger bus to/from each connected mainframe
Mainframe to mainframe phase shift	± 100 ns
Extended Synchronization(1)	
Synchronous recording actions	Not supported by Master/Slave card
Synchronous manual trigger	Not supported by Master/Slave card

(1) Extended Synchronization only supported by GEN2i Master/Slave Synchronization connector.

Physical, Weight and Dimensions	
Weight	10 kg (22 lb), add ≈ 1 kg (2.2 lbs) per acquisition board installed
Dimensions (Height * Width * Depth)	48.69 cm (19.17") * 24.70 cm (9.72") * 38.62 cm (15.20")
Cooling Fans	Two; air flow controlled by internal temperature sensors
Grounding	Mains; 4 mm Banana plug
Casing/Handle	Aluminum and Plastic cover/One carrying handle

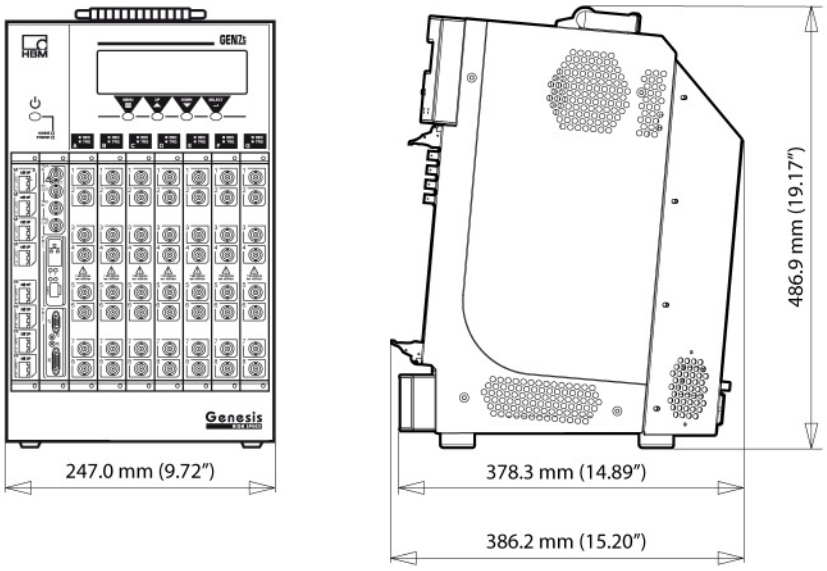


Figure 1.2: GEN7t model dimensions

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 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) 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 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 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); contact discharge ± 4 kV/air discharge ± 8 kV: performance criteria B
EN 61000-4-3	Radiated, radio-frequency, electromagnetic field immunity test; 80 to 2700 MHz using 10 V/m, 1000 Hz AM: performance criteria A
EN 61000-4-4	Electrical fast transient/burst immunity test Mains ± 2 kV using coupling network. Channel ± 2 kV using capacitive clamp: performance criteria B
EN 61000-4-5	Surge immunity test 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

Harmonized Standards for CE Compliance, according to the following directives	
Low voltage directive (LVD): 2006/95/EC Electromagnetic compatibility directive (EMC): 2004/108/EC	
EN 61000-4-6	Immunity to conducted disturbances, induced by radio-frequency fields 0.15 to 80 MHz, 1000 Hz AM; using clamp; mains 10 V RMS using clamp, channel 3 V RMS: performance criteria A
EN 61000-4-11	Voltage dips, short interruptions and voltage variations immunity tests Dips: performance criteria A; Interruptions: performance criteria C

Perception Software (option, to be ordered separately)	
DAQ software	Perception standard package. Refer to Perception specification sheet for details.
DAQ software options	Analysis, Advanced Report, Video Playback, Multi Workbooks, Information, Basic FFT, Sensor Database and more
DAQ Software and Instrument panel languages	English, German, French, Chinese, Japanese, Korean, Russian, Portuguese (Brazilian)
PNRF Free Viewer (Free of Charge)	Opens every PNRF and NRF recording to review the recorded data. Supports display cursors and display markers, quick word reporting, print display, print settings, export to ASCII, Excel, imPRESSion, RTPro and TEAM Data. Does not support any of the standard Perception options.
Perception Offline (Free of Charge)	Comes with Perception Configuration Manager. Emulates one or more GEN DAQ systems by loading the GEN DAQ system configuration out of a VWB or PNRF file. Using the Perception Offline version full Perception and GEN DAQ setups can be prepared without the need to have the real systems present. Does not support loading or creating PNRF recordings.

Application Programmers Interfaces (API)	
PNRF reader (free of charge)	
Functions	Read PNRF, NRF and LRF recording files directly in your own application.
COM Interface	The PNRF reader comes as COM interface and can be used from any application or programming language which supports COM automation.
PNRF Software Development Kit (SDK)	Installs PNRF dll's and supplies Visual Basic, C# and C++ getting started examples.
Matlab Integration	Matlab PNRF reader install and example available within the PNRF SDK
LabVIEW Integration	Available directly from National Instruments
DCE/RPC (Distributed Computing Environment/Remote Procedure Calls)	
Functions	Control Perception software from an external computer/application on Windows®, Linux, Unix, Mac OS X
COM Interface	All RPC commands have a COM wrapper for easier Windows software integration.
Available Basic Commands	Load and Save Perception setup files, Setup Recording, set and review Hardware Settings, Start/Stop/Pause/Trigger, monitor Live data.
Examples (Free of charge)	C++ and C# getting started example programs supplied for windows, source code included. Unsupported Linux getting started example on request only.
LabVIEW Integration (Free of charge)	LabVIEW getting started example using RPC/COM available.
CSI (Customer Software Interface)	
Functions	Create software extension inside the Perception software by adding CSI user sheets, custom automation and extended analyses functions. Basic sheet template included. Available for all Microsoft .NET® 4 supporting languages.
Available Basic Controls & Commands	Access to every Perception part: Start/Stop/Pause and Trigger, Start Manager, Acquisition System, Hardware Settings, Displays, Meters, User Tables, Formulas, Calculations, Data Manager, Data Sources, User variables, Notifications, Logging, Conversion Functions, Automation Actions, Sheet Manager and more, to create a dedicated application GUI that hides the entire Perception standard GUI.
Examples (Free of charge)	C# getting started example programs supplied, source code included.
Training/Support Program	
HBM offers paid professional training and support programs on all API interfaces (PNRF reader, RPC and CSI). Training program will be C# based, on-site or central at HBM location. On-site training can be customer specific. Support can be the development of a full custom software application or answering questions of software engineers.	

Acquisition Cards

Model	Type	Isolation	Max. SR(1)	Resolution	Memory(2)	Channels	Event, T/C(3)
Basic200k	Single Ended	no	200 kS/s	16 bit	128 MB	8	0, 0
Basic200k XT ISO	Unbalanced Differential	yes	200 kS/s	16 bit	128 MB	8	0, 0
Basic1M	Single Ended	no	1 MS/s	16 bit	256 MB	8	0, 0
Basic1M ISO	Unbalanced Differential	yes	1 MS/s	16 bit	512 MB	8	0, 0
Basic1M XT ISO	Unbalanced Differential	yes	1 MS/s	16 bit	512 MB	8	0, 0
Bridge200k ISO	Bridge/Differential	yes	200 kS/s	16 bit	128 MB	4	0, 0
Bridge1M ISO	Bridge/Differential	yes	1 MS/s	16 bit	512 MB	4	0, 0
Uni200k ISO	Differential/IEPE/Shunt	yes	200 kS/s	16 bit	128 MB	4	0, 0
Uni1M ISO	Differential/IEPE/Shunt	yes	1 MS/s	16 bit	512 MB	4	0, 0
Basic20k-16	Differential	no	20 kS/s	16 bit	200 MB	16	16, 0
Basic20k-32	Differential	no	20 kS/s	16 bit	200 MB	32	16, 0
HiRes250k-16	Differential/IEPE/Charge	no	250 kS/s	16/24 bit	1800 MB	16	16, 2
HiRes250k-32	Differential/IEPE/Charge	no	250 kS/s	16/24 bit	1800 MB	32	16, 2
HiSpeed 25M	Differential/Single Ended	no	25 MS/s	15 bit	128 MB	4	0, 0
HiSpeed 100M	Differential/Single Ended	no	100 MS/s	14 bit	1800 MB	4	0, 0
Fiber100M 6600	Optical Fiber	yes	100 MS/s	--(4)	1800 MB	4(4)	0, 0
Fiber100M 7600	Optical Fiber	yes	100 MS/s	--(4)	1800 MB	4(4)	0, 0
Iso1kV200k	Balanced Differential	yes	200 kS/s	16/18 bit	200 MB	6	16, 2
Iso1kV2M	Balanced Differential	yes	2 MS/s	16/18 bit	1800 MB	6	16, 2
Marker1M	Binary	no	1 MS/s	1 bit	512 MB	64	0, 0
Marker1M HV	Optical/Binary	yes & no	1 MS/s	1 bit	512 MB	8 & 32	0, 0

(1) Maximum Sample Rate/channel (not multiplexed).

(2) Total recording memory/card.

(3) Digital Events, Timer/Counter channels (Supported by GEN2i Digital Event/Timer/Counter connector only).

(4) This card supports maximum four optical fiber transmitter channels.

Optical Fiber Transmitter Channels

Transmitter
Every transmitter is a single channel unit. Every unit has an unbalanced differential input, amplifier, analog anti alias filter and ADC with an optical data and control link to the receiver card. The receiver card has the recording logic, sample rate selection and memory.

Model	Receiver Card	Power	Sample rate	Resolution	Isolation
HV6600 100M	Fiber100M 6600	Battery	100 MS/s	14 bit	User application defined
HV6600 25M	Fiber100M 6600	Battery	25 MS/s	15 bit	User application defined
MV6600 100M	Fiber100M 6600	120/240 V AC	100 MS/s	14 bit	1800 V RMS
MV6600 25M	Fiber100M 6600	120/240 V AC	25 MS/s	15 bit	1800 V RMS
7600 100M	Fiber100M 7600	External 12 V DC	100 MS/s	14 bit	User application defined

Special Function Cards

5B Carrier	Uses one GEN DAQ slot, holds up to six 5B modules. 5B modules, I/O connectors and cabling not included. An acquisition card is required for actual recording. The 5B Series signal conditioning modules provide a low cost method of connecting analog signals with data acquisition systems. They are designed to convert thermocouples, RTD's, strain gages, frequencies, potentiometers, slide wires and other signals into standardized, isolated analog outputs.

Ordering Information[1]

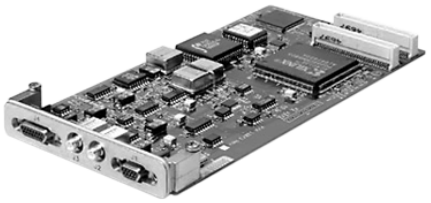
Article		Description	Order No.
GEN7t Standalone mainframe		GEN7t Tower mainframe with 7 acquisition card slots and 1 dedicated Master/Slave slot. Includes Interface/Controller module with 1 Gbit standard Ethernet interface. Maximum 100 MB/s streaming rate to appropriate PC. Includes iSCSI storage support to enable direct storage on NAS server. Available options include on-board solid state disk, optical Ethernet, IRIG, IRIG/GPS and 10 Gbit optical Ethernet. Requires Perception software with hardware control option to operate the system. Perception software is not included.	1-GEN7t-2

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

Software Options, to be ordered separately[(1)]

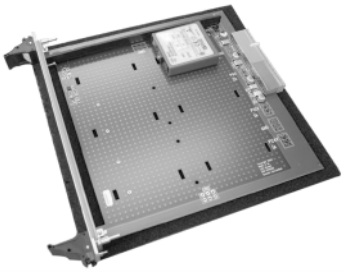
Article	Description	Order No.
Perception Standard	For setup and control of a single Gen Series mainframe as well as display of recorded data during and after recording. Runs on 32 and 64 bits versions of Windows® XP, Vista, 7 and 8. Uses maximum 2 GByte of your PC's memory.	1-PERC-ST-01-2
Perception Advanced	Same as Perception Standard but includes the options: Analysis, Reports, Info Sheets, Exports, Workbooks and Video Playback.	1-PERC-AD-01-2
Perception Professional	Same as Perception Standard but includes the options Analysis, Reports, Info Sheets, Exports, Workbooks, Video Playback, Basic FFT and Sensor Database.	1-PERC-PRO-01-2
Perception Enterprise	Same as Perception Professional but runs on native 64 bits Windows® XP, Vista, 7 and 8 only. This version supports the use of more than 2 GByte memory in your PC. Specifically important for systems using multiple mainframes, extensive use of the FFT option and/or large amounts of calculations.	1-PERC-E64-01-2
Perception Viewer	Same as Perception Standard but without mainframe setup and control.	1-PERC-VW-01-2
Perception Viewer Advanced	Same as Perception Advanced but without mainframe setup and control.	1-PERC-VA-01-2
Analysis	Analysis includes +, -, *, /, max, min, RMS and filters using a formula database.	1-PERC-OP-AN-01-2
Reporting	Create professional reports including displays, tables, text, graphics.	1-PERC-OP-RP-01-2
Exports	Additional export formats added to Perception.	1-PERC-OP-MEX-01-2
Info sheets	Allows custom entries and variable definitions to be stored with data.	1-PERC-OP-IS-01-2
Multiple Workbooks	Simultaneous multiple display windows on multiple monitor systems.	1-PERC-OP-MWB-01-2
Video Playback	Simultaneous playback of standard video files.	1-PERC-OP-VP-01-2
Basic FFT	Live FFT while recording (hardware dependent) and Review FFT.	1 -PERC-OP-BFFT-01
Multiple Mainframes	Simultaneous control of multiple GEN DAQ mainframes.	1-PERC-OP-MMF-01-2
Sensor Database	Collection of sensors' information, simplifies the set-up of an acquisition channel.	1-PERC-OP-SDB-01-2
CSI Interface	Allows the development of and running CSI programs.	1-PERC-OP-CSI-01-2
RPC/COM	Remote control of Perception, including basic hardware setup and control.	1-PERC-OP-IF-01-2
BE256/MP control	To control a single BE256 or a single MultiPro from Perception via IEEE488 interface.	1-PERC-OP-BE-01-2
SEQUENCE	To control BE3200 Test Sequencer from Perception via USB port. Requires Perception Standard or higher (1-PERC-ST-01-2).	1-PERC-OP-SEQ-01-2
STL Analysis	Special analysis routines according to the STL standard used in LV, MV and HV labs. Includes import of TGD data (Test Data Generator) for verification. Requires Analysis option (1-PERC-OP-AN-01-2).	1-PERC-OP-STL-01-2
HPHV-AA	HighPower/HighVoltage automated analysis. Evaluates data of NoLoad, ShortCircuit, Capacitive and Synthetic tests of HV/MV switchgear devices (requires signals from tripping coils and travel to be recorded). Requires STL Analysis option (1-PERC-OP-STL-01-2).	1-PERC-OP-HHP-01-2
HV-IA	High Voltage Impulse Analysis option; evaluates Lightning, Switching and Current impulses; designed according to IEC60060-1 and IEC61083-2 requirements. Allows evaluation with new k-factor method.	1-PERC-OP-HIA-01-2

(1) Software options are also sold in multiple licenses packages and multiple network license seats.

Options, to be ordered separately			
Article		**Description**	**Order No.**
IRIG PMC card(1)		GEN DAQ IRIG interface fits into open XMC/ PMC slot of GEN DAQ Interface/Controller module. Cannot be used in combination with 10 Gbit Ethernet XMC card.	1-G001-1
IRIG/GPS PMC card(1)		GEN DAQ IRIG/GPS interface fits into open XMC/PMC slot of GEN DAQ Interface/Controller module, comes with antenna and 15 m cable. Cannot be used in combination with 10 Gbit Ethernet XMC card.	1-G002-2
Solid State Disk(1)		GEN DAQ Internal SSD drive in GEN DAQ mainframe, 300 GB capacity, 50 MB/s continuous streaming rate. Sweep storage rate depending on sweep length and number of channels. Short sweeps are stored slower due to administration overhead.	1-G061-2
1 Gbit Optical Network SFP module 850 nm		GEN DAQ 1GBit Ethernet SFP, 850 nm Multi Mode, up to 500 m optical cable length supported, LC connector support. 1 Gbit SFP modules are not compatible with the 10 Gbit SFP+ modules.	1-G062-2
1 Gbit Optical Network SFP module 1310 nm		GEN DAQ 1Gbit Ethernet SFP, 1310 nm Single Mode, up to 10 km optical cable length supported, LC connector support. 1 Gbit SFP modules are not compatible with the 10 Gbit SFP+ modules.	1-G063-2
10 Gbit Ethernet XMC card(1)		GEN DAQ 10 Gbit Ethernet XMC card adds up to 2 extra 10 Gbit Ethernet network connections to a GEN DAQ series mainframe. Supports up to 200 MB/s continuous data transfer from the GEN DAQ mainframe to an appropriate PC. Requires a 10 Gbit optical network SFP+ module. Cannot be used in combination with IRIG or IRIG/GPS PMC card.	1-G064-2
10 Gbit Optical Network SFP+ module 850 nm		GEN DAQ 10Gbit Ethernet SFP+, 850 nm Multi Mode, up to 500 m optical cable length supported, LC connector support. 10 Gbit SFP+ modules are not compatible with the 1 Gbit SFP modules.	1-G065-2
10 Gbit Optical Network SFP+ module 1310 nm		GEN DAQ 10Gbit Ethernet SFP+, 1310 nm Single Mode, up to 10 km optical cable length supported, LC connector support. 10 Gbit SFP+ modules are not compatible with the 1 Gbit SFP modules.	1-G066-2
Master/Slave card		GEN DAQ Master/Slave option. Uses first slot in GEN16t rack, GEN2i and GEN5i integrated mainframes and the Master/Slave slot in GEN7t tower mainframe. The Master/Slave card is needed in master and any slave mainframe. Supports up to eight slaves using optical connections. Single 3 m (10 feet) optical cable included.	1-G040-2

(1) Denotes an option that requires factory installation.

Accessories, to be ordered separately

Article		Description	Order No.
Fiber optic Multi Mode standard cable.		GEN DAQ standard zipcord fiber optic duplex Multi Mode 50/125 µm cable, 3.0 dB/km loss, LC-LC connectors, orange. Used with 850 nm optical 1 Gbit or 10 Gbit Ethernet (1-G062-2 and 1-G065-2) and Master/Slave synchronization. Lengths 3, 10, 20 and 50 meter (10, 33, 66 and 164 feet)	1-KAB280-3 1-KAB280-10 1-KAB280-20 1-KAB280-50
Fiber optic Single Mode standard cable		GEN DAQ standard zipcord fiber optic duplex Single Mode 9/125 µm cable, 0.5 dB/km loss, LC-LC connectors, yellow. Used with 1310 nm optical 1 Gbit or 10 Gbit Ethernet (1-G063-2 and 1-G066-2). Lengths 2, 10, 20, 50 and 100 meter (6.5, 33, 66, 164 and 328 feet)	1-KAB288-2 1-KAB288-10 1-KAB288-20 1-KAB288-50 1-KAB288-100
Fiber optic Single Mode heavy duty cable		GEN DAQ heavy duty indoor/outdoor fiber optic duplex Single Mode 9/125 µm cable, 0.5 dB/km loss, LC-LC connectors, black. Used with 1310 nm optical 1 Gbit or 10 Gbit Ethernet (1-G063-2 and 1-G066-2). Lengths 10, 20, 50, 100, 150 and 300 meter (33, 66, 164, 328, 492 and 984 feet)	1-KAB289-10 1-KAB289-20 1-KAB289-50 1-KAB289-100 1-KAB289-150 1-KAB289-300
5B carrier card		GEN DAQ 5B Carrier. Uses one GEN DAQ slot, holds up to six 5B modules. 5B modules, I/O connectors and cabling not included. Basic card required for acquisition.	1-G028-2

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

B3705-1.0 en