GEN series
3PH-STR-1K0-CAT2

3-Phase Artificial Star Adapter

Data sheet

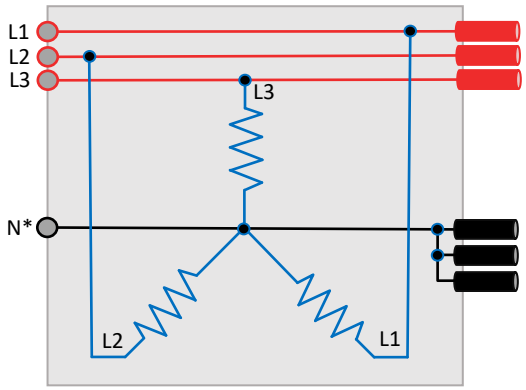
Special features

- **1750 V RMS phase to phase**
- **1000 V CAT II phase to star**
- **Typical motor impedance match**
- **Artificial star point creation**
- **4 mm safety banana plugs**
- **Matches GN310B and GN311B**

Three Phase Artificial Star Adapter
The 3-phase artificial star adapter is specifically designed to be applied with the HBM GN310B/GN311B power analyzer cards when used to measure electrical machines. The adapter creates an artificial star voltage when no access to the star voltage of an electrical machine is available.

The start point output connector enables a near unlimited phase star point setup by linking the star point output pins together.
With the star adapter directly inserted to the GN310B/GN311B, the safety of the operator is ensured and cabling efforts are minimized in order to optimize the test setup.

Block Diagram



Specifications

The artificial star adapter creates an artificial star point to measure 3-phase signals	
Maximum input voltage	1750 V RMS between each of the phases (GN310/GN311B adapter) 1000 V CAT II, 600 V CAT III, 300 V CAT IV basic insulation within a phase
Components per phase	Capacitance 125 pF (min: 120 pF; max: 140 pF) Resistance 1.2 MΩ (min: 1.188 MΩ; max: 1.212 MΩ)
Inputs	3; 4 mm safety banana plugs
Outputs	6; 4 mm safety banana pins; plugs straight into GN310B/GN311B cards
Artificial star N*	1; 4 mm safety banana plug as reference plug only. **Note:** Not to be used as input
Safety	Compliant with IEC61010-1 1000 V CAT II, 600 V CAT III, 300 V CAT IV basic insulation within a phase
Application use	The 3-phase signals L1, L2 and L3 can be connected with inputs L1, L2, L3 of the artificial star adapter. The connection N* is the voltage present on the artificial “star point”.

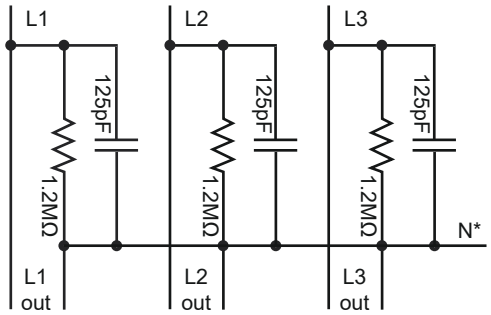


Figure 1.1: Electrical schematic

Physical, Weight and Dimensions

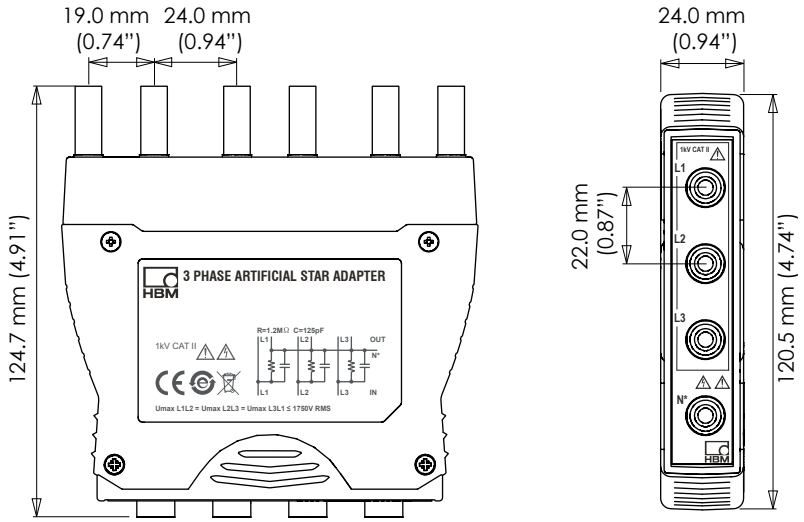


Figure 1.2: Artificial star adapter dimensions

Weight	270 g (9.5 oz)
Material housing	Polycarbonate – ABS
Setup	One box can be plugged into a single GN310B/GN311B card Two or more GN310B/GN311B cards with Artificial star adapters fit next to each other
Temperature range	
Operational temperature	-20 °C to +55 °C (-4 °F to +131 °F)
Non-operational (storage)	-25 °C to +70 °C (-13 °F to +158 °F)

Type Testing

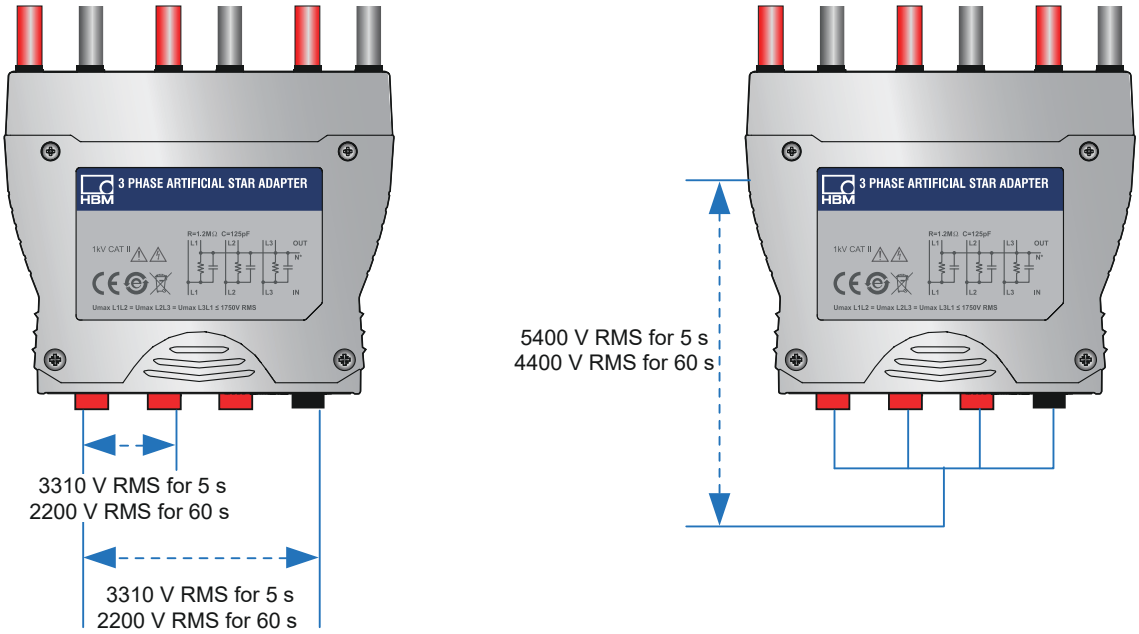


Figure 1.3: Artificial star adapter type testing

Type Testing	
Input to case/screw	5400 V RMS for 5 s 4400 V RMS for 60 s
L to L	3310 V RMS for 5 s 2200 V RMS for 60 s
L to N	3310 V RMS for 5 s 2200 V RMS for 60 s

Artifical Star Adapter Wiring Diagram

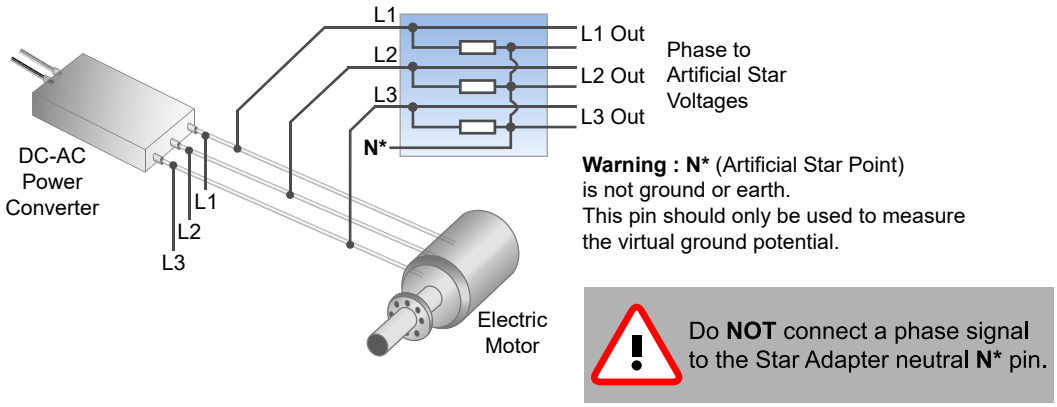


Figure 1.4: Three phase representative use of artificial star adapter

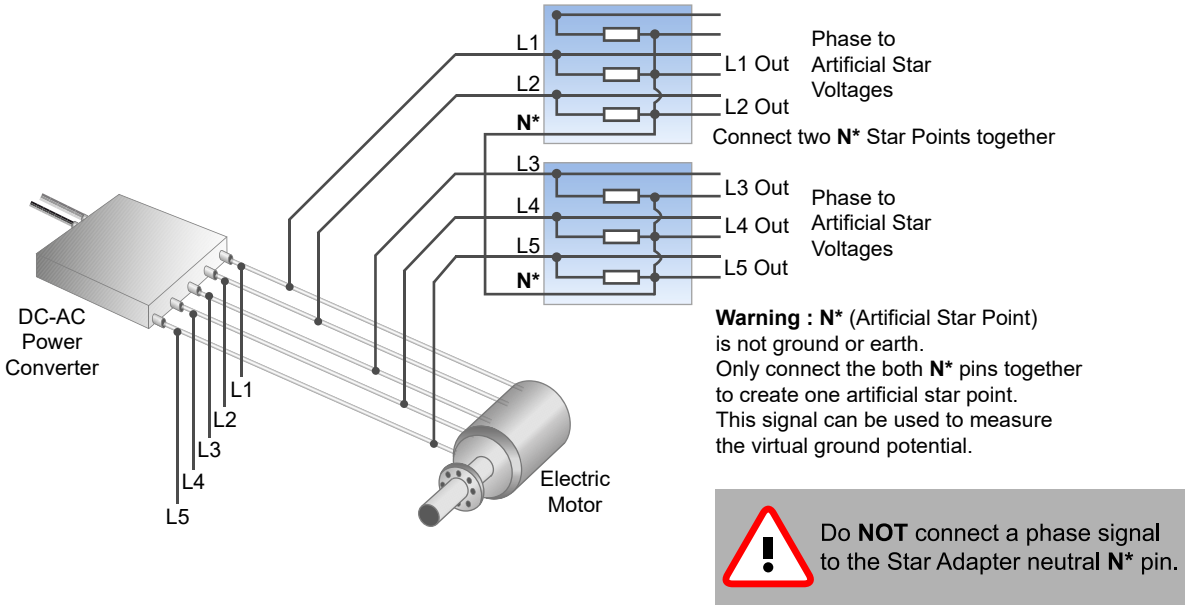


Figure 1.5: Five or more phase representative use of dual star adapter

Star Point Wire Diagram

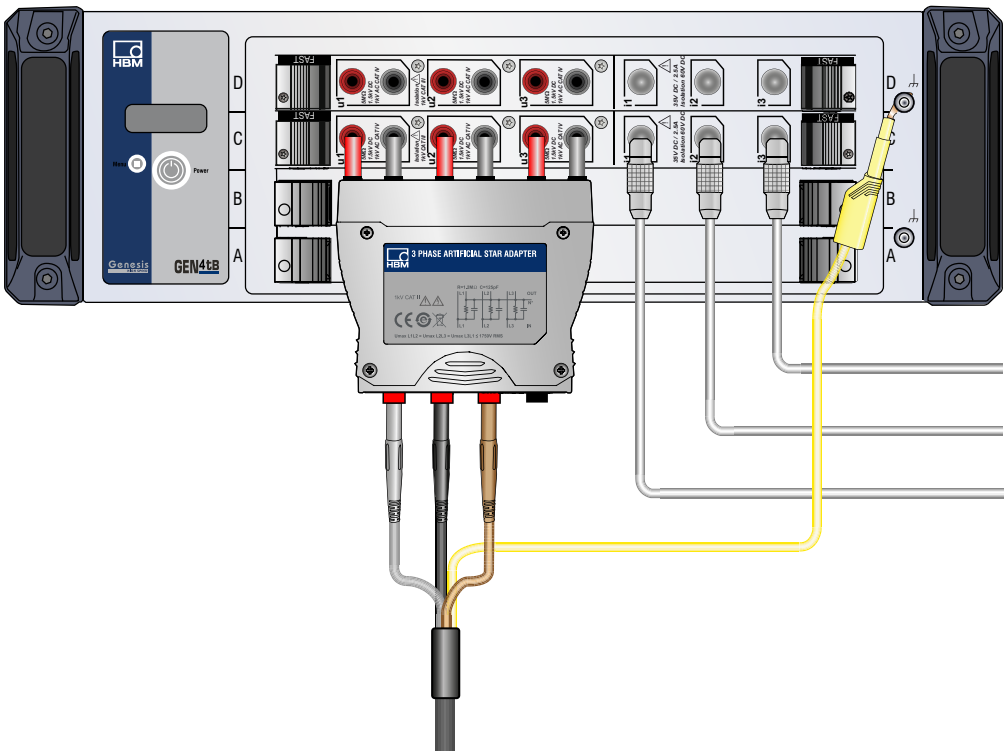


Figure 1.6: Three-phase to artificial star connection

Environmental Specifications	
Temperature Range	
Operational	-20 °C to +55 °C (-4 °F to +131 °F)
Non-operational (Storage)	-25 °C to +70 °C (-13 °F to +158 °F)
Thermal protection	Automatic shutdown above +85 °C (185 °F) with notifications starting at +75 °C (+167 °F)
Relative humidity	0% to 80%; non-condensing; operational
Protection class	IP20
Altitude	Maximum 2000 m (6562 ft) above sea level; operational
Shock: IEC 60068-2-27	
Operational	Half-sine 15 g/11 ms; 3-axis, 1000 shocks in positive and negative direction
Non-operational	Half-sine 35 g/6 ms; 3-axis, 3 shocks in positive and negative direction
Vibration: IEC 60068-2-64	
Operational	2 g RMS, ½ h; 3-axis, random 5 to 500 Hz
Non-operational	3 g RMS, 1 h; 3-axis, random 5 to 500 Hz
Operational Environmental Tests	
Cold test IEC 60068-2-1 Test Ad	-20 °C (-4 °F) for 2 hours
Damp heat test IEC 60068-2-3 Test Ca	+55 °C (+131 °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 IEC 60068-2-14 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 IEC 60068-2-30 Test Db variant 1	+25 °C/+55 °C (+77 °F/+131 °F), humidity > 95/90% RH 6 cycles, cycle duration 24 hours

Harmonized Standards for CE and UKCA Compliance, According to the Following Directives[1]

Low Voltage Directive (LVD): 2014/35/EU
Electromagnetic Compatibility Directive (EMC): 2014/30/EU

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 (2013)	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 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 MHz to 2.7 GHz 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
EN 61000-4-6	Immunity to conducted disturbances, induced by radio-frequency fields 150 kHz to 80 MHz, 1000 Hz AM; 10 V RMS @ mains, 3 V RMS @ channel, both using clamp: performance criteria A
EN 61000-4-11	Voltage dips, short interruptions and voltage variations immunity tests Dips: performance criteria A; Interruptions: performance criteria C

(1) UKCA This product complies with the essential requirements of applicable and relevant regulations of the United Kingdom (UK).

Adress of Manufacturer, importer and/or representative:
Hottinger Brüel & Kjaer GmbH
Im Tiefen See 45
64293 Darmstadt
Germany

Perception and eDrive Training Program

Figure 1.7: Perception on-site training

HBM offers paid professional training and support programs on all API interfaces (PNRF reader, RPC and CSI). Training programs are based on C#, are on-site or are at a central HBM location. On-site training can be specific for each customer. Support can be the development of a fully customized software application or answering questions from software engineers.

S-TRAIN1-GEN_PERC	First day on-site basic training on GEN DAQ/PERCEPTION. Example content: Basic usage, hardware setup, acquisition. Training can be customized for specific training needs.
S-TRAIN2-GEN_PERC	Second day on-site enhanced training on GEN DAQ/PERCEPTION. Training can be customized for specific training needs.
S-TRAIN1-eDRIVE	First day on-site basic training on eDrive application specifics. Example content: Basic usage, hardware setup, acquisition. Training can be customized for specific training needs.
S-TRAIN2-eDRIVE	Second day on-site enhanced training on eDrive application specifics. Training can be customized for specific training needs.
1-PERC-CSI-TRAIN	Two day on-site Perception CSI training for software programmers During the training software programmers learn how to get started using the CSI template, make changes to the Perception user interface, to add new mathematical routines to the Formula Database or to add User Keys etc. The exact training details can be fully customized to the programmers needs including reviews and examples how to create the exact CSI changes of choice. Basic Microsoft® Visual Studio software C# programming skills are required before joining this training. More dedicated detailed training is available on request.
1-PERC-CSI-PROJ	One day eMail/Phone support for Perception CSI or RPC programmers. Get support from a HBM senior software engineer. Support can range anywhere from answering "how-to" question, assisting in analysing any kind of (performance) issue to generating basic getting started example code fragments.

Calibration Service

HBM offers a wide range of calibration services. Check your local sales contact for more information.
HBM recommends yearly recalibration of all systems and transducers.

Figure 1.8: HBM calibration process

Ordering Information

Article		Description	Order No.
Artificial star adapter		The artificial star adapter is a plug-on interface card to measure 3-phase signals with the GN310B/GN311B cards. This adapter is intended for measuring 3-phase signals while creating a virtual/artificial star point.	1-3PH-STR-1K0-CAT2

Accessories, to be ordered separately

Article		Description	Order No.
1000 V CAT IV / 1500 V DC CAT III 3-wire Isolated shielded test leads		The cable uses safety-shrouded banana plugs for: Available lengths: 1.5 m (4.92 ft), 3.0 m (9.84 ft), 6.0 m (19.7 ft),12 m (39.4 ft)	1-KAB2139-1.5 1-KAB2139-3.0 1-KAB2139-6.0 1-KAB2139-12.0

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