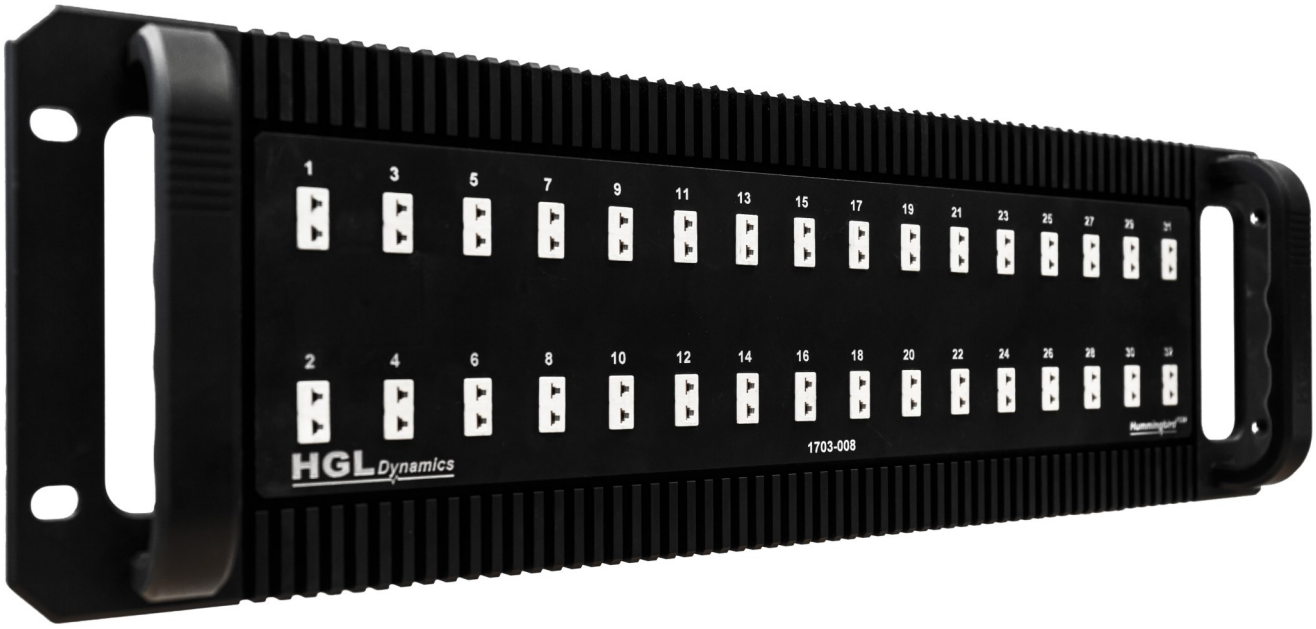
Hummingbird^{32TC}

32 Channel Rugged Temperature Acquisition System

HGL Dynamics



Connect | Condition | Acquire

Key Features

- Highly portable Thermocouple Front End unit
- 19-bit ADC, 10Hz Sample Rates
- Gigabit Ethernet Connectivity
- Supports Type B, E, J, K, N, R, S & T Thermocouples
- Built-in Linearisation
- Built-in Cold Junction Compensation per channel
- Multi-unit Synchronisation (GPS, IRIG, LVDS, IEEE-1588)

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Introduction

Hummingbird^{32TC} is a rugged 32 channel data acquisition system designed to provide a world class, highly portable solution for Thermocouple based Temperature recording and real time monitoring either standalone or as part of a Dynamics Measurement System.

The Hummingbird^{32TC} features twin gigabit Ethernet connections, allowing remote control from remote laptops or PCs, as well as data streaming for monitoring / archiving.

The Hummingbird^{32TC} is presented in a Front Panel (FP) variant only thus it requires connection to an external PC for data acquisition and storage operations, it cannot operate without an attached computer.

The Hummingbird series have proven themselves worldwide in numerous flight tests with engine and air frame manufacturers. They have also seen service worldwide for vibration monitoring in the power generation industry.

Hardware Overview

Rugged Chassis

The unit is supplied in rugged milled aluminium housing for use in the close proximity to the test article.

The chassis has a large thermal mass which helps to prevent thermal shocks adversely affecting measurements

Independent Inputs

32CH

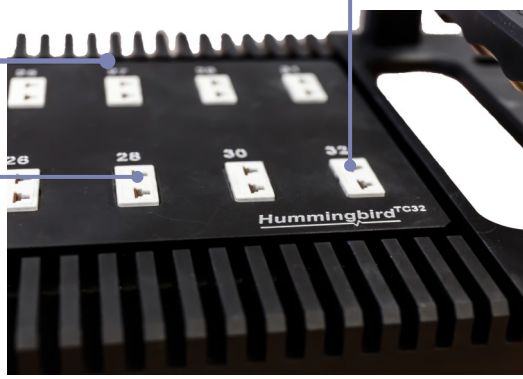
Equipped with 32 independent Thermocouple channels

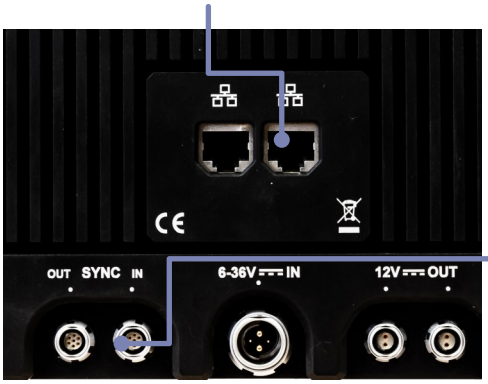
Connector Compatibility

The unit is supplied with White (Cu) Miniature Thermocouple Connectors as standard.

Remote Access

Using the wired Ethernet, Wi-Fi or optional GSM interface users can remotely operate the acquisition software and access the data stored on the SSD drive.





LVDS Synchronisation

- LVDS (Low Voltage Differential Signalling) Synchronisation Interface
- <10nS Unit to Unit
- 0-200m Unit to Unit cable lengths
- Daisy-Chain, Star or mixed topologies

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Software Overview

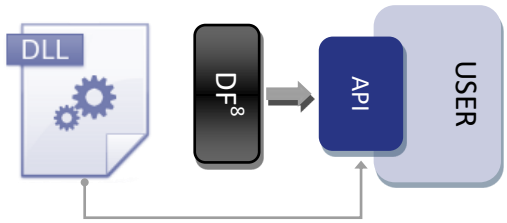
HGL Dynamics provides multiple software platforms for Hummingbird Acquisition systems; these range from low level Network APIs, Windows® DLL, LabVIEW™ Drivers, Single Instrument Applications (Apps), and full Measurement System software. This flexibility allows users to choose the best platform for their particular applications and / or increases the utilisation of the hardware for multiple uses.

Network API

All HGL Dynamics hardware modules are Ethernet connected to each other and their host PC(s); a fully documented Programmer's API is available for integrators / customers who wish to access the modules at this level or need to integrate the modules with a non-Windows operating system.

Microsoft Windows DLL

HGL provides (as standard) a Windows DLL with every Hummingbird Acquisition System; for Microsoft Windows users this provides a simpler method to access all the functions of the hardware.



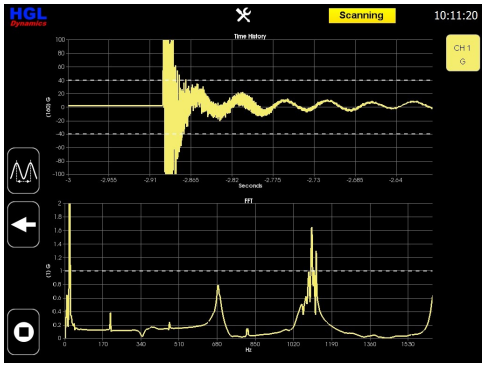
LabVIEW™ Driver

HGL can provide a LabVIEW™ driver for the Hummingbird Acquisition System; this driver allows full access to the functionality of the hardware, and is available for the Microsoft Windows Operating System.

Single Instrument Apps

HGL has developed a number of Single Instrument Apps, primarily for its Firefly system. These apps can be operated on a Hummingbird and Laptop / PC system equally well. The Apps are intended to provide a family of simple, easy to use applications which turn the Hummingbird into a single instrument, examples include:

- FFT Analyser
- Oscilloscope
- Chart Recorder
- Rotating Machinery Analyser
- Trim Balance
- Power Dip & Rise
  (requires isolation amplifier hardware)



Full Measurement System Software

For the past 15 years, HGL has providing a fully integrated, modular, network distributed Dynamics Measurement System; this software is intended for wide variety of applications and for systems ranging from small portable units to large multi-site systems with hundreds or thousands of channels.
The System comprises four main parts, Acquisition, Monitoring, Analysis and Data Management, and is focused on providing robust, flexible, fixed or mobile operation with ease of use as a primary consideration.

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Software Overview

Data Acquisition - Hawk

HGL's Hawk acquisition software provides everything a user needs to configure, calibrate and acquire data from the acquisition hardware. Full control and feedback of the system is provided by the Hawk GUI Client application; this provides an intuitive instrument-like interface that allows even novice users to operate large channel count systems, even from remote locations.

Real-Time Monitoring - Hawkeye

Hawkeye allows one or more users to monitor the signals being acquired in real-time (<0.1s latency).
Fully customisable displays such as FFTs, Waterfalls, Oscilloscopes, Numerical, Speed and Tracked-orders, Phase, Bode, Orbit, n^{th} Octave etc, provide a rich monitoring environment.
Hawkeye also provides Time, Frequency, Order and Phase domain alarming facilities for all channels simultaneously, with support for many different alarms types per channel. Hawkeye is also client / server based with the 'thin' Hawkeye Client allowing local or remote monitoring (performance dependent on network infrastructure).

Analysis - Aurora

Aurora provides an in-depth analysis tool for acquired data; this is usually required post-test, but can be operated simultaneously with testing if useful. Post-test analysis can pinpoint areas of interest / problems to be further investigated, and for this purpose Aurora provides a range of client / server based tools to analyse, investigate, mine, summarise and report on acquired data.
Multiple users can use Aurora simultaneously, and in common with HGL software portfolio access is via a network connected thin-client (Aurora Client) application, thus allowing both local and (potentially widely) remote users to access data simply and efficiently.

Data Storage & Archiving - Hercules

Prolonged or large-scale data acquisition generates a lot of data, 10's and 100's of TBytes are not unusual for large enterprises. Data is expensive to collect and the functionality to efficiently store and retrieve legacy data is essential for in-service investigations, product development etc.
HGL's Hercules software provides an integrated, low-cost, yet highly scalable and safe data management solution for any sized data acquisition operation. The key to the system's success is support for virtually any common media type (SD cards, HDD/SSDs, LTO tapes etc.) combined with a unique database architecture providing simple, yet highly efficient data storage information, and a client/server architecture which allows data to be managed across multiple remote sites from a single intuitive Graphical User Interface.

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Specification

General

Dimensions (W x H x D):	435 x 158 x 47 mm
Weight:	5.0 kg (typical)
Supply Voltage:	12 V DC
Power:	2W (typical)

Input Configuration

Input Channels:	32
Thermocouple Types:	B, E, J, K, N, R, S & T
Quantization:	19-bit
Input Range:	-210°C to + 1600°C
Linearisation:	Automatic per type
Accuracy:	+/-0.15% Full Scale & Linearity Error
Cold Junction Accuracy	+/-0.7°C
Operating Range:	-20°C to +85°C
Input Voltage Protection:	+/-45V
Fault Detection:	Open Thermocouples Over & Under Temperature
Mains Rejection:	50 & 60Hz*

*Software configurable parameter

Environmental

Operating Temp.:	-55 to +125°C (full range) -25 to +85°C (best accuracy)
Relative Humidity:	< 90% RH non condensing

Synchronisation

LVDS:	10 ns per unit
LVDS (max distance)	200 m # (node to node)

#If longer distances are require please contact HGL

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Training

Training

HGL Dynamics offers a wide variety of training workshops and courses. Workshops are conducted at one of our global offices or at the client's site by our training team, all of whom have many years' of industry experience and knowledge.
Typical training courses include: Vibration Fundamentals, Signal Processing, Rotating Machinery, Advanced use of HGL Software and Analysing Large Datasets.

Information

About HGL Dynamics

HGL Dynamics is a world-leading supplier of services and high specification equipment for the integrated capture, monitoring, analysis, storage and management of high bandwidth data.

Purchasing & Availability

The HGL Dynamics Hummingbird^{32TC} Data Acquisition Module is now available for purchase or lease. Please contact one of our HGL Dynamics offices below for further information or to request a quote.

UK & International

HGL Dynamics Ltd
Hamilton Barr House
Bridge Mews
Godalming
GU7 1HZ
UK

Tel +44 1483 415177

France

HGL Dynamics France
25 Rue du Mont Olivet
78500 Sartrouville
France

Tel +33 1 75 93 80 20

North America

HGL Dynamics Inc
2461 Directors Row
Suite J
Indianapolis
IN 46241
USA

Tel +1 317 782 3500

South Korea

HGL Dynamics South Korea
768 Posvill Officetel
Gumi-dong, Bundang-gu
Seongnam-si
Gyeonggi-do
Korea
483-861

Tel +82 109 052 2638

FS72209

Company registered in England No. 3844513