

GPS sample sensor to breakout box (to Conductus LTC-20 controller)

The sample stick of Quantum 9506 cryostat has two different temperature sensors. Only one of them is connected to **ch. 2** of Conductus LTC-20 temperature controller via two breakout boxes - the other wiring is not connected to any stick sensor.

To avoid interference (and for an easy purchase of cables), the two stick sensors use an 8-wire cable, while the **50-Ohm** heater uses a 2-wire cable. All shielded.

This **first part** shows the 3-m connection of the stick sample sensor with the box.

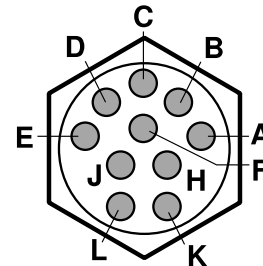
Female cable plug wiring at Quantum sample stick

10-pin Miniature Circle Hex connector GH-10F: GH10FSCLSH16

Free-end wiring to breakout box

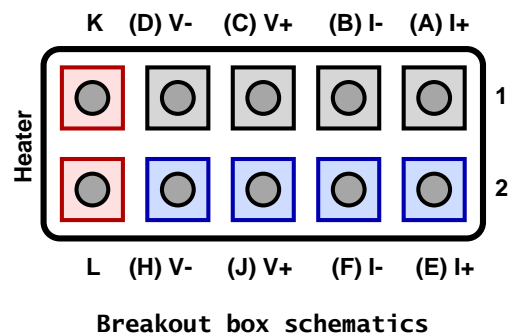
See schematics for the box layout (with two sensors).

Only one sensor (top row) and the heater are used.



Female: GH10F mating-side view

Quantum (GH10)	Breakout box (10-pin)
A	1 I+
B	2 V+
C	3 I- Sensor 1 (sample)
D	4 V-
E	5 I+
F	6 V+
J	7 I- Sensor 2 (NC)
H	8 V+
L	9 Heater +
K	10 Heater -



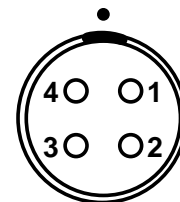
Breakout box schematics

The **second part** shows the 5-m connection of LTC-20 ch. 2 (sample) with the box 1. Shielded Belden 8723 cable: two twisted pairs (black-red, V) and (green-white, I)

Male cable plug wiring at Conductus LTC-20

4-pin LEMO 1B.304 series connector

Full specification: FGG.1B.304.CNAD52

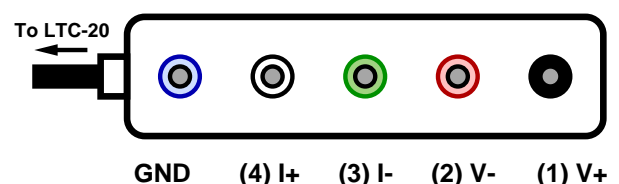


Male: LEMO 1B mating-side view

Free-end wiring to breakout box

See schematics for the box layout.

LTC-20 (LEMO 1B)	Breakout box (5-pin)
1	1 V+ Black
2	2 V- Red
3	3 I- Green
4	4 I+ White
Shield	5 GND Blue



Breakout box 1 schematics

The final connection is: Sample stick sensor -> breakout box -> breakout box 1 -> LTC-20. When connecting the breakout boxes, respect both type and polarity (i.e., V+ in V+, I- in I-, etc.). The sample temperature is read by channel 2 of LTC-20.

Selection and ordering information for GH series connectors

Generic Miniature Circle Hex connector GH-10F

GH-10F miniature circle hex connectors from Positronic. For legacy avionics. GH10FSCLSH16 is sold as A1-107 from Oxford Instruments (produced by MIOS).

GH: Basic GH series
10: Connector variant: 10 pin (also 4, 5, 7, and 9)
F: Gender (M, F)
SC: Contact termination: Solder cup
LS: Mounting and locking: Lock spring (or LR Lock ring)
H16: Cable adapters (Hoods): H16 - Aluminum hood

LEMO Male 1B series connector

FGG.1B.304.CNAD52 LEMO: 4-pin 1B male indoor, keyed connector.

FG: Model: FG - straight plug
G: Alignment key
1: Connector size (also 0, 2, 3, 4, 5, or 6)
B: Connector series (also K, T, S, or E)
304: Insert configuration (4 pin)
C: Housing: C - Brass (S - steel, etc.)
N: Insulator (PEEK)
A: Contact type: A male - female (simple soldering tool)
D: Collet: D type
52: Cable diameter (5.2 mm collet = max cable diam.)

See also: <https://octopart.com/electronic-parts/connectors/circular-connectors>
<https://pinoutguide.com>
<https://estore.oxinst.com/eu/zidA1-107>