Kodak

Thermal 2 Head

Measuring Voltages in a TH2 Head

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Revision History

Revision	Date	Author	Comments
A-A	23 Aug 2004	Alvaro Ireta	Initial release
A-B	29 Mar 2007	Kyle Good (M Munroe editor)	Updated the template. Added pin out details as an appendix.

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1. BACKGROUND

This procedure describes how to measure the voltages in a Thermal 2 head (TH2). For an overview of the voltage system, see ***Figure 3:*** *TH2 Voltages and Safety Lines*.

2. REQUIREMENTS

- Voltmeter test probe

3. PROCEDURE

WARNING: To avoid short-circuiting the leads, always use the correct pin when testing the connector. A short-circuit can permanently damage the power supplies.

For full details on all the connector pins, see Appendix A: WLPB PCB External Connectors.

1. Turn off the power to the device.
2. Disconnect both military connectors from the head.
3. Turn on the power.
4. Test the values by carefully inserting the probe into the female side of the military connectors (device side). Use ***Table 1:*** *Connector Leads and Voltages* as a guide. When you measure the **SAFETY 1** and **SAFETY 2** lines on a Kodak Lotem® Quantum™ platesetter, the focus defeater is required.

   The pins on the signal military connector (the smaller of the two) are labeled with both upper and lower case letters (for example, A and a). Make sure that you test the correct one. See ***Figure 1:*** *Signal military connector (the smaller of the two* connectors) and ***Figure 2:*** *Power military connector (the larger of the two* connectors) for detailed drawings.

Note: Some voltages are redundant, which means that the value can be read in one or more pins. For example, 48 volts DC (Vdc) unswitched can be measured in pins A and L, or B and M, or A and M, or B and L.

Table 1: Connector Leads and Voltages

To Measure	Use Military Connector	Pin Number (Positive Lead)	Pin Number (Negative Lead)	Value Measured (Volts)	Notes
48 Vdc unswitched	Power (large)	A,B	L,M	+48 Vdc	General power for the head. Can be read any time the machine is turn on.
48 Vdc	Power (large)	C,N	D,P	+48 Vdc	Write laser power.

To Measure	Use Military Connector	Pin Number (Positive Lead)	Pin Number (Negative Lead)	Value Measured (Volts)	Notes
switchable for write laser					Needs to be enabled by the output device.
SAFETY 1	Power (large)	F	E	+ 24 Vdc	Safety interlock 1 for focus laser and shutter. Requires the focus defeater on a Lotem Quantum device.
SAFETY 2	Power (large)	H	G	+ 24 Vdc	Safety interlock 2 for focus laser and shutter. Requires the Focus defeater on a Lotem Quantum device.
SAFE +	Control (small)	Z	C	+12 Vdc	Shutter control line. Also controls focus laser. Needs to be enabled by the output device.
SAFE –	Control (small)	a	C	0 V dc or +12 Vdc	Line from the host. If it reads 0 Vdc, the host is asking the head to open the shutter. If 12 Vdc then the shutter will be closed. Needs to be enabled by the host (MCE, MPE, ICE).

Note: The values of **SAFETY 1**, **SAFETY 2** and **SAFE +** must be correct in order for the focus laser driver and shutter to work. If these are correct, then shutter control from the host happens when **SAFE –** changes values. When **SAFE –** has a value of 0, it means that the shutter is open.

4. DIAGRAMS

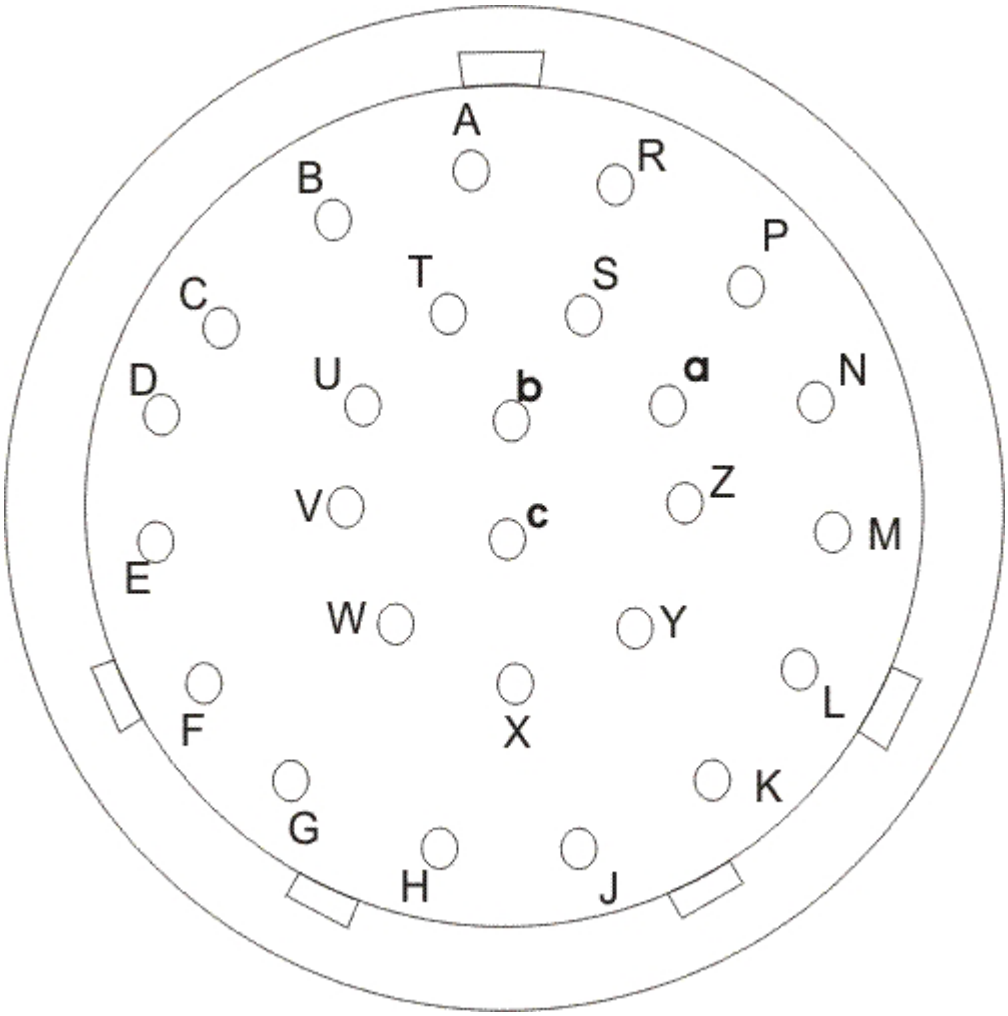


Figure 1: Signal military connector (the smaller of the two connectors)

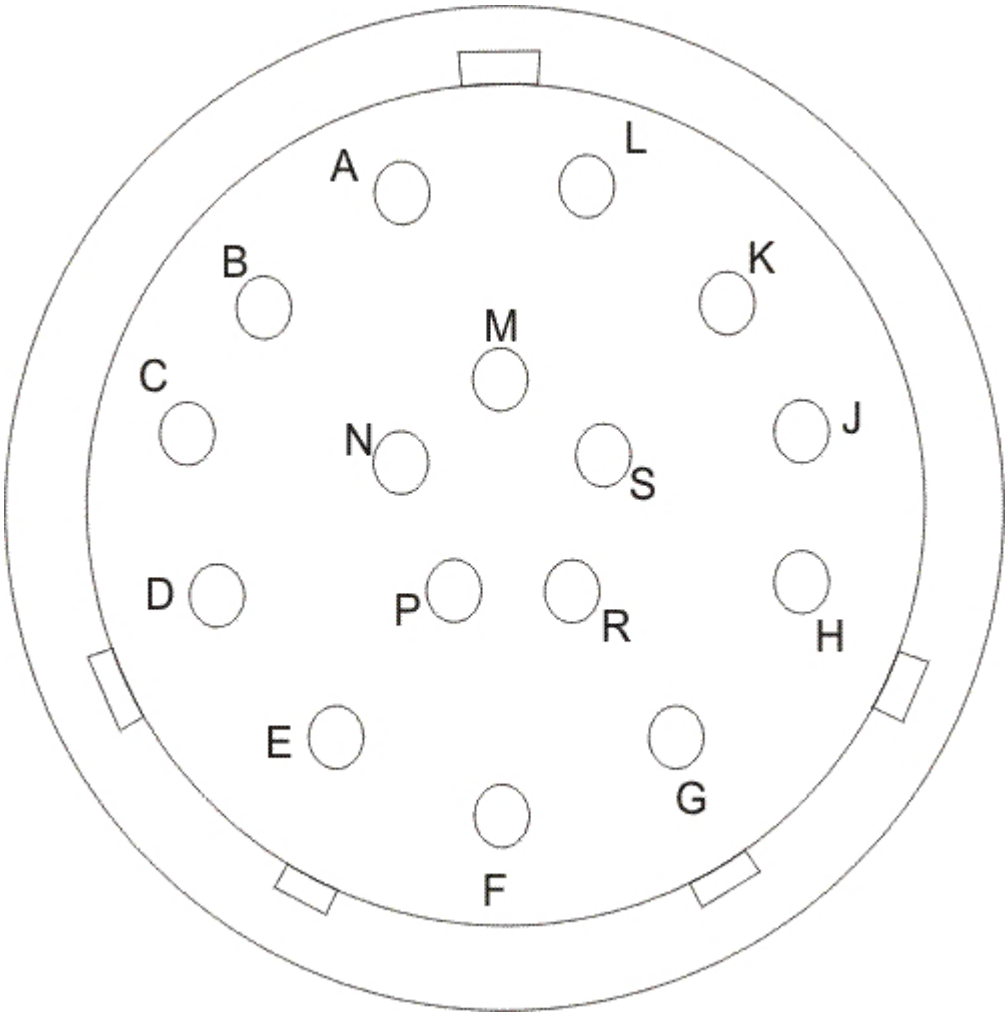


Figure 2: Power military connector (the larger of the two connectors)

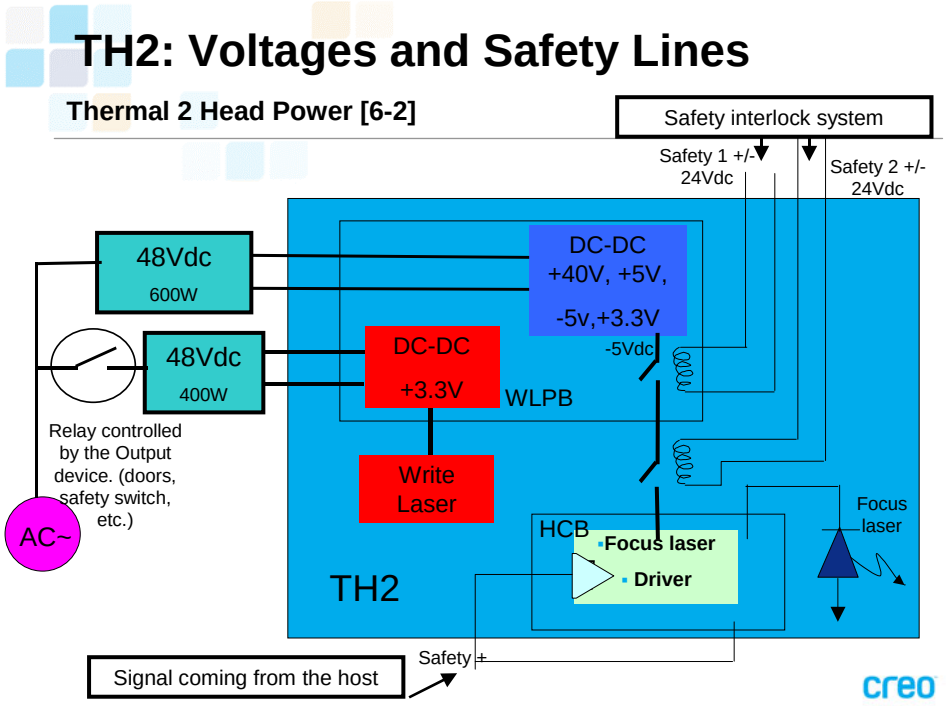


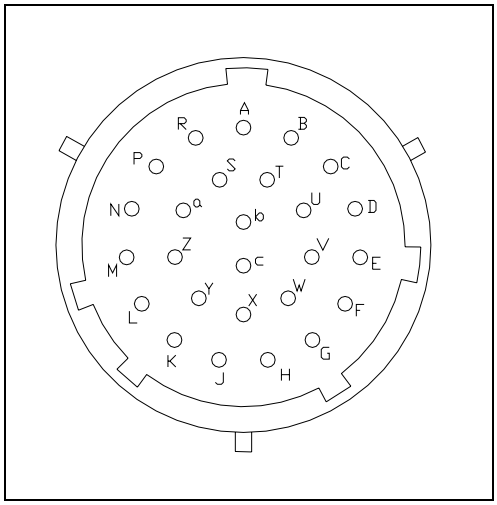
Figure 3: TH2 Voltages and Safety Lines

5. APPENDIX A: WLPB PCB EXTERNAL CONNECTORS

This appendix describes the TH2 head's external electrical connections.

5.1 Signal Connector

Pin configuration looking at the connector's face (KPT2E16-26 face detail):



5.2 Signal Connector Pin Descriptions

Pin	Name	Source	Description	Electrical
A	CBLG	HEAD	Ground reference for head control lines.	Imax: 4A
B	/CBL	HEAD	Head cable connection detect. Pulled to CBLG inside head.	Imax: 2A
C	SPRO+	HOST	Spare line into head. (RS-422 level, positive input)	Low logic state: Vdif = -0.2 max* High logic state: Vdif = 0.2 min*
D	SPRO-	HOST	Spare line into head. (RS-422 level, negative input)	Low logic state: Vdif = -0.2 max* High logic state: Vdif = 0.2 min*
E	IMAG+	HOST	Imaging signal into head. (RS-422 level positive input)	Low logic state: Vdif = -0.2 max* High logic state: Vdif = 0.2 min*
F	IMAG-	HOST	Imaging signal into head. (RS-422 level, negative input)	Low logic state: Vdif = -0.2 max* High logic state: Vdif = 0.2 min*
G	SCLK+	HOST	Stroke clock. (RS-422 level, positive input)	Low logic state: Vdif = -0.2 max* High logic state: Vdif = 0.2 min*

Pin	Name	Source	Description	Electrical
H	SCLK-	HOST	Stroke clock. (RS-422 level, negative input)	Low logic state: Vdif = -0.2 max* High logic state: Vdif = 0.2 min*
J	NLIN+	HOST	New line signal. (RS-422 level, positive input)	Low logic state: Vdif = -0.2 max* High logic state: Vdif = 0.2 min*
K	NLIN-	HOST	New line signal. (RS-422 level, negative input)	Low logic state: Vdif = -0.2 max* High logic state: Vdif = 0.2 min*
L	RXD+	HOST	Control data receive line (RS-422 level, positive input)	Low logic state: Vdif = -0.2 max* High logic state: Vdif = 0.2 min*
M	RXD-	HOST	Control data receive line (RS-422 level, negative input)	Low logic state: Vdif = -0.2 max* High logic state: Vdif = 0.2 min*
N	RST+	HOST	Head reset line. Defaults to logic low (unasserted) when the cable is unattached. (RS-422 level, positive input)	Low logic state: Vdif = -0.2 max* High logic state: Vdif = 0.2 min*
P	RST-	HOST	Head reset line. Defaults to logic low (unasserted) when the cable is unattached. (RS-422 level, negative input)	Low logic state: Vdif = -0.2 max* High logic state: Vdif = 0.2 min*
R	/BOT+	HOST	Serial boot load enable. Defaults to logic high (unasserted) when the cable is not attached. (RS-422 level, positive input)	Low logic state: Vdif = -0.2 max* High logic state: Vdif = 0.2 min*
S	/BOT-	HOST	Serial boot load enable. Defaults to logic high (unasserted) when the cable is not attached. (RS-422 level, negative input)	Low logic state: Vdif = -0.2 max* High logic state: Vdif = 0.2 min*
T	TXD+	HEAD	Control data transmit from the head. (RS-422 level, positive output).	Voh min: 2.5V (Ioh = -20mA) Vol max: 0.5V (Iol = +20mA)
U	TXD-	HEAD	Control data transmit from the head. (RS-422 level, negative output)	Voh min: 2.5V (Ioh = -20mA) Vol max: 0.5V (Iol = +20mA)
V	EDGE+	HEAD	Edge detect from the head. (RS-422 level, positive output)	Voh min: 2.5V (Ioh = -20mA) Vol max: 0.5V (Iol = +20mA)
W	EDGE-	HEAD	Edge detect from the head. (RS-422 level, negative output)	Voh min: 2.5V (Ioh = -20mA) Vol max: 0.5V (Iol = +20mA)
X	/EX_SHTR	HEAD	Drive signal for external shutter. Relay contact to ground, referenced to GBLG	Imax: 2A Vmax: +250VAC or +30VDC
Y	EH.PWR	HEAD	Head is alive signal. Referenced to GBLG.	Vout:+5V

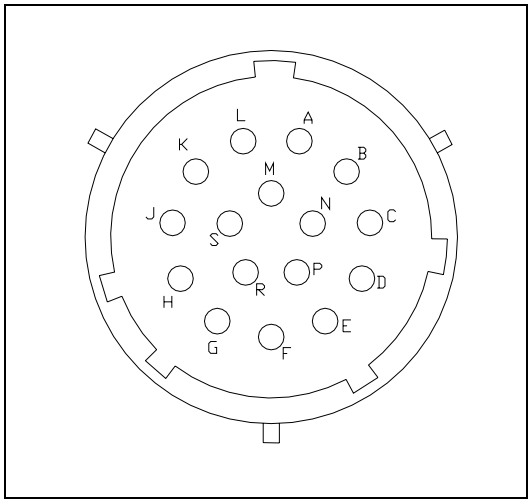
Pin	Name	Source	Description	Electrical
				Imax: 100mA
Z	SAFE+	HOST	Interlock for internal shutter. Reference to CBLG.	Vin: 12V Iin: +50mA (Inductive)
a	SAFE-	HOST	Shutter control. Connect to CBLG to enable internal shutter.	Iout -25mA (Inductive)
b	/EMSN	HEAD	Write Laser active warning signal. Pulled to CBLG when active	Imax: 2A Vmax: +250VAC or +30VDC
c	CBLG	HEAD	Ground reference (See pin A)	Imax: 4A

Notes:

- The maximum common mode input voltage must not exceed +/-7V, referenced to CBLG.
- Vdif = (Vpositive input) – (Vnegative input)

5.3 Power Connector

Pin configuration looking at the connector's face (TGC-45-10060 face detail):



5.4 Power Connector Pin Descriptions

Pin	Name	Source	Description	Electrical
A	+48VU.S	HOST	48V + supply source into the head for all auxiliary systems	48V +/-10% @10.6A (507W)
B	+48VU.S	HOST	Redundant connection. See pin A	Redundant supply.
C	+48VS.S	HOST	48V + supply source into the head for the write laser.	48V +/-10% @ 6.4A (305W)
D	+48VS.R	HOST	48V – supply return for write laser.	Return.
E	SAFETY 1-	HOST	Return line for focus laser & shutter, enable safety interlock number 1.	Return for interlock number 1.
F	SAFETY 1+	HOST	Supply line for focus laser & shutter, enable safety interlock number 1.	Vnom=24V Inom =12.5mA Vmin=20V Vmax=31V

Pin	Name	Source	Description	Electrical
				Inductive load.
G	SAFETY 2-	HOST	Return line for focus laser & shutter, enable safety interlock number 2.	Return for interlock number 2.
H	SAFETY 2+	HOST	Supply line for focus laser & shutter, enable safety interlock number 2.	Vnom=24V Inom =12.5mA Vmin=20V Vmax=31V Inductive load.
J	GROUND	HOST	Case ground bonding. Must be able to carry Ifault (internal fault current).	Ifault min = 30A DC
K	EH.CBL	HEAD	Cable Detect. This line is attached to GROUND in the head, for use as a cable attached detection.	Imax = 2A
L	+48VU.R	HOST	Return line for the auxiliary (un-switched) supply.	Return.
M	+48VU.R	HOST	Redundant connection. See pin L	Redundant return.
N	+48VS.S	HOST	Redundant connection. See pin C	Redundant supply.
P	+48VS.R	HOST	Redundant connection. See pin D	Redundant return.
R	N/C	--------	No connection.	
S	GROUND	HOST	Redundant parallel high current connection. See pin J	Redundant

5.5 Imaging Data Connector

This connector is a 75Ohm male BNC connector. It is located under the fluid connectors. The signal is transmitted, uni–directionally.