TO BE DISCONTINUED 12/2016. FOR REPLACEMENT MODEL, CLICK HERE: NTM-P

BARGRAPH/CONTROLLER/REMOTE DISPLAYS

Direct Replacements for Ametek (Dixson) BE051 & BE101Models
>30 INPUT SIGNAL CONDITIONERS

HI-Q101

DESCRIPTION

OTEK's *New* **HI-Q101** is not only a form, fit and function replacement of the **BE051** & **BE101** but a 21st Century technology equivalent of our successful **HI-Q** Series. The look is similar but the performance is different. You get many included features and options not available before, such as:

***Relays**: 2 each with S.P.D.T. 1 amp contacts, or Open Collector Transistors (O.C.T.) for fast switching.

***Limits:** 100% adjustable via 15 turn potentiometers on the rear of the unit.

***Display:** 101 monolythic bright Red LED display with four (4) Red full digits and "-" sign with over/underange indication for either vertical or horizontal mounting.

***Housing:** Same as **BE** Series with added rear slots for new options.

***Connector:** Same as the **BE** (edgeboard) or the new "Euro" style plug-in screw terminal connector for 16-22 gauge wire.

FEATURES

- Current Loop or AC Signal Powered
- Microprocessor-based
- Serial I/O (RS232, 485 or USB)
- 5-48VDC, 90-265VAC or USB Powered
- Dual Alarms (Relays or O.C.T.)
- V/mADC, RMS or Other Input Signals
- Edgecard or Plug-In Screw Terminal Connector
- Form, Fit and Function "+" New Technology Replacement for Dixson/Ametek BE Series
- Lifetime Warranted

If you don't see it, ask for it!

***Serial I/O:** None, RS232D, RS485, 7 Bit Parallel or **USB** and you can even power the **HI-Q101** from the **USB**!

***Power Input:** 5V non-isolated (like the **BE**) or 5, 12, 24 & 48VDC or 90-265VAC isolated.

SIGNAL CONDITIONERS: The **HI-Q101** offers over 20 input signal conditioners (see ordering information and description) for all your needs. Take special note of our patented (#7,626,378) A.C. Powerless™ options (8, B, Y, and Z) for A.C. power line monitoring/control without requiring power supply. The signal powers the **HI-Q101.**

SPECIFICATIONS @5VDC POWER 25°C AMBIENT (Basic Unit)

# Segments (Red)	101
Analog Accuracy & Resolution	± 1%
# Digits (9.9.9.9)	Four (-4)
Digital Accuracy & Resolution	±0.05%
Display Colors	Red (Other colors, contact factory)
Polarity	Unipolar
Zero & Span	Yes
Input Impedance mA/VDC	See Range
Response Time	75ms (10-90% of F.S.)
Serial I/O	RS-232C/RS485/USB
Characters	ASCII
Address Selection	Via Serial Port
Power Req'd @5VDC	0.25W (1W with relays)
Over-Under Range	Display Blinks
Baud Rate (1200-19,200) Selectable	9600 Std.
Power Input Non-isolated	5VDC±5%
Power Input Isolated	5-48VDC
Power Input Isolated	90-265VAC
Operating Temperature	0-60°C
Storage Temperature	-20 to 70°C
Humidity	5-95% N.C.
MTBF (Calculated)	>100,000Hrs
Temp. Coefficient:	±0.005%/°C
Warranty	Lifetime (LTD)

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HI-Q101 Series continued

HOW IT WORKS:

AC SIGNAL POWERED: For VAC & Hz we use a capacitor limiting rectifier to power the **HI-Q101** and monitor the VAC with an RMS-DC converter. For Hz we use an F-V for accurate conversion. For A.A.C. we invented (Pat. # 4,908,569) a C-V converter to extract the current from your C.T. for power and monitor the signal with RMS-DC. (Digit 2, Options Q-T). See note under option "Z."

EXTERNALLY POWERED: Non-Isolated 5VDC or isolated 5-48VDC or 90-265VAC 50/60Hz is optional (Digit 3, Options 0-7). Max Power: 1 Watt.

SERIAL I/O

OPTION 4, 7-BIT PARALLEL (REMOTE DISPLAY): Specifically designed for Legacy PLC. Contact Otek. This option converts the 101 into a binary (7 bits) remote display. The parallel data (D0-D6 & storage) is displayed in both numerical and bargraph (101 segments). The bargraph range is 0000000 to 0110010 (0-50). Others on request. The standard 7 bit code is positive logic "TTL" levels and latches the data on the rising edge of the strobe signal (Pin 6). This option requires the dual edge card connection (Option 0, Digit 4) on the part number. Not offered with screw connector (Option 1). The connector is dual row, 18 positions (36 total), 0.156" centers for 1/16" P.C.B. Right (top) row is numeric, left (bottom) row is alpha.

Connections: C: D0; 3: D1; D: D2; 4: D3; E: D4; 5:D5; F: D6: 6: Strobe (Strobe>50uS high); U & 17: Power Ground, V & 18: +5 VDC +/-5%@200mA Max. Do not connect to other terminals. Other power inputs or data inputs available on request.

OPTION 1: 4-20mA EXTERNALLY POWERED: It only drops 0.1V @ 20mA (5 Ohms) but the "**HI-Q101**" needs 5VDC @ 50mA to operate. **Accuracy:** ±0.05% of F.S.

OPTIONS 2-4: VDC & mADC EXTERNALLY POWERED: Input impedance is 1 Mega Ohms on all VDC ranges and 50 Ohms on 1 mA range.

Accuracy: ±0.05% of F.S.

OPTIONS 5, & 6: V & mA RMs: Here we use a **True RMS-DC** Converter for accurate (± 0.05%) measurement of sine waves up to 10KHz (± 0.1% for 10-20KHz) and SCR's fired to ± 1%. Input impedances vs. range are the same as for VDC & mADC ranges. **Warning: No Isolation on power option 0-2!**

Accuracy: ±0.1% of F.S.

Note: Options 5 & 6 are legacy options. Use options E-N for specific ranges.

OPTIONS 8: HERTZ SIGNAL POWERED: Warning: NO Isolation! Use P.T. The **Hi-Q101** is powered by the signal from your P.T. (~150mW) and converts the frequency to voltage. Frequency range is 50-440 Hz. Also see Option "T" for up to 20K Hz. Use Powerless™ (Option 0) on digit 3.

OPTION 9: CUSTOM: Use this option to describe any custom input, scale or modification to the **HI-Q101** and contact us for feasibility and cost.

Option A: 4-30VDC Signal Powered: Another **OTEK** innovation. The voltage signal powers an **LDO** to protect the **HI-Q101** and a divider network is used to measure and display the signal. If the relatively low impedance (500 Ohms) and current (3-20mA) required by this Powerless™ technique is unacceptable, use Options 2-8 (externally powered).

Option B: AC Watts Signal Powered: Warning! No Isolation! Here we combine the powerless VAC & AAC options to arrive at real power calculations through our **CPU** and **DAC**. The same warnings and precautions of Options 8 & Z apply. Range: VAC: 50-150; AAC: 0.1 - 5A; Frequency: 40-450Hz; Accuracy & Linearity: ±0.1% of F.S.; Conversion: True RMS. Contact **OTEK** for other functions. Use Powerless™ (Option 0) on digit 3.

Option C & D:

These are higher sensitivity (10uV) versions of Option 5. Zin is 1 MEG Ohm. Same Connections.

Options E-M: V & mA RMs: Here we use a **True RMS-DC** Converter for accurate (± 0.05%) measurement of sine waves up to 10KHz (± 0.5%, 10-20KHz) and SCR;s fired to ± 2%. Input impedances vs. range are the same as for VDC ranges.

Option N: 5Amps AC: Specifically for current transformers (**C.T.**) this option requires an externally mounted (supplied) 0.05 Ohm, 0.1% 3 Watt resistor. You can mount the "Shunt" at your **C.T.** or next to the **HI-Q101** but make sure the connections are "Perfect" to electrical codes. The C.T. might have **"Lethal" High Voltage** without a "Shunt" (Open) and the **HI-Q101** will "Smoke". See OTEK's New **ACS** models for **C.T.** powered instruments (Patent #7,626,378).

HI-Q101 Series continued

Option P: Strain-Gage (<1K Ohm Type): Here we use a high accuracy and stability constant current (~1mA) source, and a differential amplifier to convert the 2 or 3m V/V (typical) sensitivity of your "Loadcell." ***Specify*** your Strain-Gage sensitivity and full scale and the **HI-Q101's** display at Zero and Full Scale Please!

Accuracy: ±0.05% of F.S.

Option Q: Strain-Gage (≥1K < 5K Ohm): These are typically "Monolithic" **S-G** that require constant voltage (preferably) excitation. We use 4.096V for high stability and accuracy. **Specify** your S-G impedance and sensitivity and the **HI-Q101's** display at Zero and Full Scale.

Option R: RTD (PT100): We excite your 2, 3 or 4 wire RTD with 200uA to avoid the "self heating" effect. The range of the **HI-Q101** is the same as your **RTD** typically -200^{0}C to +800^{0}C (-328 + 1562^{0}F). You can place the decimal point at will (typically -200.0 to 800.0 (-328.0 to 1562.0)). The **PT100** has a temperature coefficient of 0.00385 Ohms/Ohm/^{0}C. For 1000 Ohm RTD & legacy 0.00392 TC (known as ANSI 392) contact **OTEK** and use Option "09".

Option S: Thermocouple (Type J): This **TC** has a range of -210 to +760^{0}C (-350 + 1390^{0}F). Its color is white (+) and Red (-), cold junction (CJ) is inside the **HI-Q101** at the connector base. Make sure the connections from your **TC** are as close as possible to avoid errors and calibrate after connecting. If you short out the **HI-Q101's** TC wires together, the **HI-Q101** will read the ambient temperature due to its built-in C.J.C.

Contact **OTEK** for types "K," "T" and others, including copper (10 Ohms).

Options T: Frequency Input: We use an **F-V** to accept frequencies from 40 - 20KHz and amplitudes from 1-400V peak or dry contact or open collector transistor (O.C.T.). For 50-440 Hz power line frequency measurement use Option #"8" or see our **ACS** Powerless™ Series.

Option U: %RH: This conditioner is designed to interface to a typical (capacitance type) 2-3pF/% of **RH** made by several manufacturers. Use Option "09" and contact **OTEK** to specify your sensor's specifications.

Option V: pH (Acidity): We use a FET input (1015) amplifier and calibrate the **HI-Q101** for 0-14.00 pH using the Industry's standard + 413 mV = + 7pH co-efficient.
Accuracy: +0.05% of F.S

Option W: ORP(Oxygen Reduction Potential): Our FET amplifier (10^9) accepts the industry standard 2000mVF.S. of the probe and the **HI-Q101** displays it in % (0-100.00%)

Option X: Hi Speed Peak & Hold (P&H): Now you can capture fast transients greater than 50 microseconds (even faster soon) with resolution greater than 0.1% of F.S. and retention of greater than 10 years (Due to OTEK's new and patent-pending **P&H Option**).

Input: V or mADC (Specify Range). Contact **OTEK** for V/mA RMS or Loop Powered).

Accuracy: +/- 0.1% of F.S. +/- 1 Digit

Linearity & Resolution: +/- of F.S.

Response time: >20KHz (<50us)

Retention: >10 years (with power on).

Option Y: Signal Powered for VAC: No power supply req'd! Just connect to your P.T.(no-isolation) and display the value. Ideal for Analog meter replacement, range: 40-150VAC, 50-440Hz. Burden 0.1W, Accy.& Lin. :+/- 0.5% of F.S.

Note: No alarms (Digit 6) are allowed.

Option Z: Signal Powered Amps AC: No Power Supply Req'd! Just connect to your P.T. range: 0.5-5Amp; 50-440Hz; burden; 0.1W Accy. & Lin.; +/- 0.5% of F.S.
Note: Our internal C.T. isolates your C.T. and powers the **Hi-Q101**. Note: No alarms (Digit 6) are allowed.

ABOUT AC POWERLESS TECHNIQUE: As with analog meters, the AC signal power models have a minimum signal input for illumination. For voltage or frequency, the minimum input signal is 40 VAC. For current, the minimum input signal is 0.5 AAC. See other options for externally powered models. For watts the input signal is 40VAC & 0.05AAC.

More: New Signal Conditioners will be added as per your requests and popularity, such as Ohms, Conductivity, Shock, Vibration, Position etc. Contact **OTEK**.

POWER/INPUT (Digit 3):
OPTIONS 0-3: NON-ISOLATED
VDC POWER:

All listed I/O options (except Powerless™) are available. Power requirements vary with options included. The basic **HI-Q101** requires under 150mW (30 mA@5VDC). Fully Loaded: 1 watt.

HI-Q101 Series continued

OPTIONS 4-7: ISOLATED POWER

These options offer minimum isolation of 500 VAC or DC and their efficiency is about 80%. All power input ranges are +/-10%.

Option 8: Powerless™:
The **HI-Q101** is powered from the signal that it measures. ONLY available for options 8, A, B, Y and Z of input signal (Digit 2).

WARNING: Any other I/Os are NOT isolated from signal. Options 8, B, Y & Z (Digits 2 & 3) could have lethal potentials!

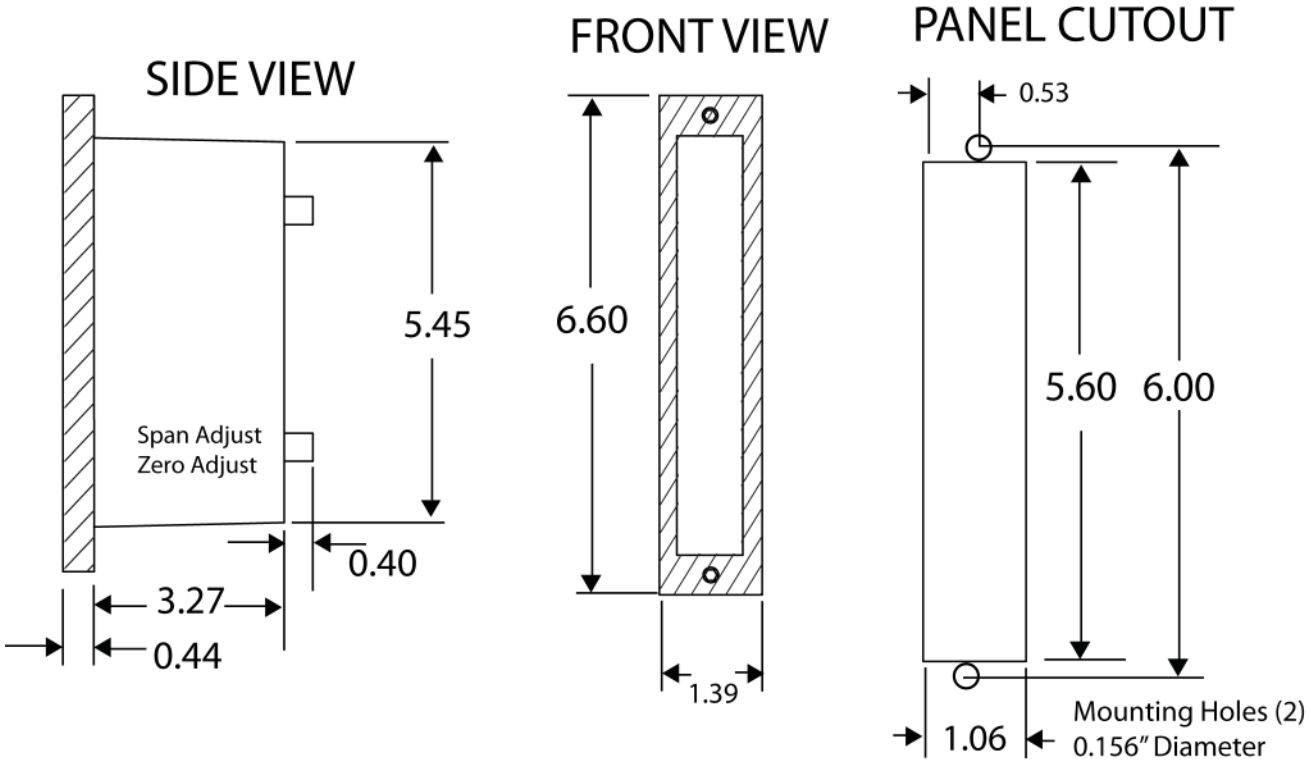
DIGITAL DISPLAY (DIGIT 5): Select desired mounting & display type on ordering information.

CONNECTOR (DIGIT 4): Either edge card for existing legacy replacement (Option 0, see note 2 on ordering information), or plugable screw terminal Option 1.

Specs: 18 Pos. single row, 0.156" center for 0.062 card.

ALARMS (DIGIT 6): Relays are SPDT 1A@120VAC/30 VDC resistive load & 10mS Response time, open collector transistors (O.C.T.) are 30mA, <30 VDC, 100µS response time.

HI-Q101 MECHANICAL INFORMATION



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HI-Q101 ORDERING INFORMATION

4-24-13

Smart Bargraph-Remote Display
Direct Replacements for Ametek/Dixson Models BE051 & BE101

MODEL HI-Q101

NOTES: Please READ BEFORE building part number:

1. If digit 2 is option 8, A, B, Y or Z, then digit 3 must be option 8 and digits 1 & 6 must be option 0.
2. If digit 2 is option 7, then digit 1 must be option 4.
3. If digit 3 is option 2, then digit 1 must be option 3.
4. If digit 2 is option 0, digit 1 cannot be option 0.

HI-Q101 - [1] [2] [3] - [4] [5] [6] - [7] [8] [9]

SERIAL I/O (1,2,3,4)
- 0.....None
- 1.....RS232C
- 2..... .RS485
- 3.....USB
- 4.....7 Bit Parallel
- 9.....Custom (Contact OTEK)

INPUT TYPE FULL SCALE (1,2,4) *
- 0.....None
- 1.....(100) 4-20mADC
- 2.....(1M) 0-1VDC
- 3.....(1M) 10VDC
- 4.....(1M) 0-100VDC
- 5.....(1M) VRMS (Specify Range)
- 6.....ARMS (Specify Range)
- 7.....7Bit Remote Display
- 8.....50-440 Hz Signal Powered (P.T.)
- 9.....Custom (Contact OTEK)
- A.....Signal Powered 4-30VDC
- B.....AC Watts Signal Powered (P.T. & C.T.)
- C.....±200mVDC
- D.....±50mVDC
- E.....200mV RMS
- F.....2V RMS
- G.....20V RMS
- H.....200V RMS
- J.....50mV RMS
- K.....2mA RMS
- L.....20mA RMS
- M.....200mA RMS
- N.....5 Amp RMS
- P.....Strain-Gage (<1 K Ohm)
- Q.....Strain-Gage (>1K Ohm)
- R.....RTD (PT100)
- S.....TC (Type J)
- T.....Frequency (40-20 K Hz Line)
- U.....% RH (Specify Sensor)
- V.....pH (0-14.00)
- W.....ORP (0-2000mV)
- X.....High Speed Peak & Hold (2VDC)
- Y.....VAC Signal Powered (P.T.)
- Z.....AAC Signal Powered (C.T.)

POWER INPUT (1,3)
- 0..... Non-Isolated 5VDC
- 1.....Non-Isolated 7-32VDC
- 2.....Non-Isolated USB Powered
- 3..... Isolated 5VDC +/- 10%
- 4..... Isolated 12VDC +/- 10%
- 5..... Isolated 24VDC +/- 10%
- 6..... Isolated 48VDC +/- 10%
- 7.....Isolated 90-265VAC
- 8.....(Pending)....Signal/Loop Powered
- 9.....Custom (Contact OTEK)

CONNECTOR TERMINATION (5)
- 0..... Edgecard
- 1.....Screw Terminal

DIGITAL DISPLAY & MOUNTING
- 0.....None & Vertical
- 1..... Vertical Included
- 2.....Horizontal Included
- 3.....None & Horizontal
- 4.....None, Center Zero, Vertical
- 5.....None, Center Zero, Horizontal
- 9.....Custom (Contact OTEK)

ALARMS (1,6)
- 0.....None
- 1.....Relays (Rear Adjustment)
- 2.....Relays (Remote Adjustment)
- 3.....O.C.T. (Rear Adjustment)
- 4.....O.C.T. Remote Adjustment)
- 9.....Custom (Contact OTEK)

SCALE PLATE
- 0..... Standard (0-100%)
- 9.....Custom (Contact OTEK)

RANGE/CALIBRATION
- 0.....Standard
- 9.....Custom (Contact OTEK)

DISPLAY COLOR (7)
- 0..... Standard Red
- 9.....Custom (Contact OTEK)

* For bipolar input specify & contact OTEK.

NOTES (Continued):

5. Edgecard connector NOT included. Use single sided 18 position on 0.156" centers for 0.62" PCB or use Option 1.
6. Remote adjustment requires 2 ea. 10K Ohm, 10 turn potentiometers (not supplied) connected to the rear via 4 wire cable (not supplied). 7. Standard red digits and bargraph. For other colors, contact OTEK.

***DOWNLOADS:* For manuals, user-software or drivers:**

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HI-Q101 vs. BE101 & BE051 Part No. Cross Reference

Note: The HI-Q101 is only available with 101 segments, not 51 (BE051)

P/N BE051 or BE101 -	HI-Q101 - (Only 101 Segments)
A = End Zero or _ _ _ _ _ **B** = Center Zero*	Select Option On Digit #5
X = No Set Points or _ _ _ **J** = In Unit or_ _ _ _ _ _ _ **K** = Remote _ _ _ _ _ _ _	Use "**0**" on Digit #**6** Use "**1**" or "**3**" on Digit #**6** Use "**2**" or "**4**" on Digit #**6** Note: O.C.T. or Relays
X = No Digits or _ _ _ _ _ **Y** = 3 Digits or_ _ _ _ _ _ **T** = 4 Digits	Use "**0**, **3**, **4** or **5**"on Digit #**5** Use "**1**" or "**2**" on Digit #**5** Note: Only 4 Digits Are Available
X = Single Ended or _ _ _ **L** = Differential	No need to Specify For Differential Use Option #9 on Digit 3 and Specify Input Signal, or use any Isolated Power Input (Options 3-7 on 3rd digit).
Specify Full Scale Input and **V** or **A** ie; 200V	Select Option # For Full Scale On Digit **#2.** **Note:** Range Field Selectable or Use #**9** and Specify
µA, mA, A, mV or V	Included On Signal Input Digit #**2**. No Need To Specify
DC or **AC**	Included On Signal Input Digit #**2** Included On Digit #**5** (Mounting) Select
V = Vertical or **H** = Horizontal	Option # With or Without Digits Standard is 0-100%.(N.C.) Use
Custom Scale Plate P/N and Specify	Option #**9** On Digit #**7** and Specify (Std. is 0--100%)
Not Available	Serial Communication - Select Option # On Digit #**1**
Only 5VDC Power	Use # "0" or Select Option # On Digit #**3**
Connector: Only Solder Tail Edge Card Available	Select No Connector (Option 0) or Screw Terminal Connector (Option 1) on Digit #**4**
Warranty: 1 Year	Warranty: Lifetime (LTD.)

Example of Part Number Matching
BE101AJTX4/20MADC_V_ _ _ _

HI-Q101-010-013 = No Serial I/O, 4-20mA F.S., 5VDC Power, Edge Card Termination (No Connector Included), Digital Display, Vertical Mount, Open Collector Transistors (O.C.T.) Included For Set Points Local Adjustment, Standard 0-100% Scale Plate.

Note: Input signal option 0 & 7-Z were not offered by the BE101.

Your Comments & "Custom Requirements" are Welcome

PART # SCRATCH PAD

HI-Q101 _ _ _ _ _ _ _ _ _
1 2 3 4 5 6 7 8 9

PART # SCRATCH PAD

HI-Q101 _ _ _ _ _ _ _ _ _
1 2 3 4 5 6 7 8 9

PART # SCRATCH PAD

HI-Q101 _ _ _ _ _ _ _ _ _
1 2 3 4 5 6 7 8 9

10/19/10

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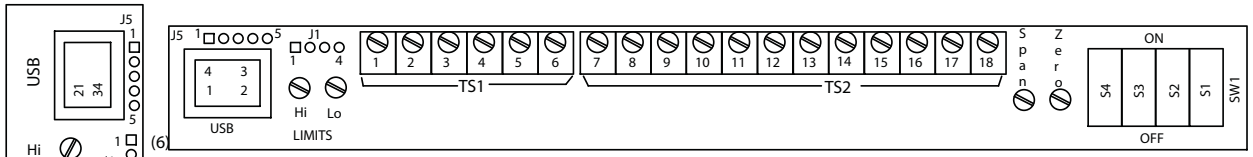
Connections

Warning: Due to added features of the HI-Q101 some non-essential terminals have been changed.

Please refer to the ordering information (page 5) to determine the configuration of the unit(s) you have ordered. **NOT ALL** features are available on all units and incorrect power or signal inputs could **damage the unit**! The following figure of the back of the unit will aid in making the appropriate connections. The edge board and screw terminal terminations are identical.



Updated 12/14/11

		Description (what it does) and notes
1	L.L.O.C.T.	LOW LIMIT OPEN COLLECTOR TRANSISTOR, ACTIVE LOW
2	H.L.O.C.T.	HI LIMIT OPEN COLLECTOR TRANSISTOR, ACTIVE LOW
3	DIG. GND. I/O	NON ISOLATED POWER GROUND & RETURN FOR O.C.T. & SHIELD FOR SERIAL I/O
4	RXD/A (YOUR TXD/A)	RS232 OR RS485 DATA INPUT NOTE 1
5	TXD/B (YOUR RXD/B)	RS232 OR RS485 DATA OUTPUT
6	+5 V POWER I/O	NON ISOLATED 5VDC INPUT OR OUTPUT (MAX 50mA LOAD) SEE TS1-3 (OPTION 0)

(10) TS2

				OPTIONS 0 & A	1-6, C, D, E-N & T-W	8 , B, Y & Z	P & Q	R & S	X
(1)	7	IN LO	LOW INPUT SIGNAL FOR CUSTOM INPUTS (OPTION 5, 6 &9 ON DIGIT 2)		- In or Lo Signal	VAC Low	-S	+E	R
(2)	8	IN HI	HI INPUT SIGNAL FOR CUSTOM INPUTS (OPTION 5, 6 &9 ON DIGIT 2)		+ In or Hi Signal	VAC Hi	+S	+S	+ Sig.
(3)	9	L.L.N.C.	LOW LIMIT RELAY CONTACT NORMALLY CLOSED	NC	Note 1	Note 2	Note 3	Note 4	Note 5
(4)	10	L.L. COM.	LOW LIMIT RELAY COMMON CONTACT						
(5)	11	L.L.N.O.	LOW LIMIT RELAY CONTACT NORMALLY OPEN NOTE 3	NC					
(6)	12	- SIGNAL IN	- INPUT SIGNAL/-LOOP FOR V/mA DC ONLY	- INPUT	- Input	AAC Low	+E	-S	rd.
(7)	13	+ SIGNAL IN	+ INPUT SIGNAL/+LOOP FOR V/mA DC ONLY	+ INPUT	+Input	AAC H	-E	-E	+5 V Out
(8)	14	H.L.N.C.	HIGH LIMIT RELAY CONTACT NORMALLY CLOSED						
(9)	15	H.L. COM.	HIGH LIMIT RELAY CONTACT COMMON						
(10)	16	H.L.N.O.	HIGH LIMIT RELAY CONTACT NORMALLY OPEN NOTE 3						
(11)	17	POWER INPUT -/LO	A.C. LOW OR -VDC ISOLATED (OPTIONS 2-7) OR GROUND FOR NON-ISOL. 6-14V (OPTION 1)						
(12)	18	POWER INPUT +/HI	A.C. HIGH OR +VDC ISOLATED (OPTIONS 2-7) OR +V FOR NON-ISOL. 6-14V (OPTION 1) NOTE 4						

Notes:
1. +5 VDC Out < 50 mA
2. For options 8 & Y, only use pins # 7 & 8. For option B use pins #7, 8, 12 & 13. For option Z only use pins 12 & 13.
3. S=Sense, E=Excitation
4. For 3 wire, jump pin #12 to13. For 2 wire, also jump pins 7 & 8.
5. R=Reset. Jump pin #7 to 12 to capture peak. Open pin #7 to Reset (also after power up)

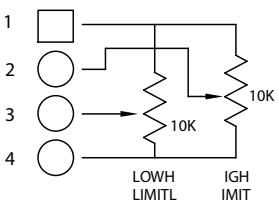
NOTE: WHEN REPLACING DIXSON/AMETEK BE051/101 WITH DIFFERENTIAL INPUT (OPTION "L") IT IS BEST TO USE ISOLATED 5VDC POWER INPUT (OPTION 3 ON 3RD DIGIT) OR ANY ISOLATED POWER INPUT.

(7) SPAN, ZERO

(8) S4, S3, S2, S1 (OFF / ON)

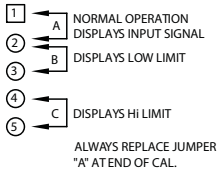
REMOTE ALARM ADJUSTMENT: (POTS. NOT SUPPLIED)

J1 (Options 2 & 4, 6th Digit)



SET POINTS MONITOR (NOT AVAILABLE WITH USB I/O)

J5 (Options 1- 4, 6th Digit)



RANGE SWITCHES

Option	Range	S1	S2	S3	S4
1	4-20mA	X	X		
2	2V	X			
3	20V			X	
4	200V				X

X=ON

Non Serial Models Calibration:

1. Select desired range (see table).
2. Apply "0" volts or 4mA and adjust "Z" pot for zero display just to have bars 0 and 1 switching (or as desired).
3. Apply full scale signal (20mA or 2, 20, or 200V) and adjust "S" pot for full scale (1000 counts) just to have bar 50 lit but not blinking or as desired.
4. Check midranges for linearity, that's all!

Notes:

(1.) For RS485 add 120 ohm across A and B on first and last units on bus.

(2.) Reserved for input signal conditioner (AC, VA, S-G, TC, RTD, pH, etc.)

(3.) Max. switching current is ½ A at 120VAC or 0.1A at 30VDC. Add external arc suppression (transorbers) as required.

(4.) These inputs are isolated from all other terminals but NO isolation exists between all those terminals except relay contacts. All DC power inputs are ±5%. A.C. power input range is 90-265VAC 50/60 Hz.

(5.) USB V2.0 "B" compatible connector. If USB powered (option 3 on 3rd digit) do NOT connect to terminals 17 and 18!

(6.) Hi and Lo limits adjustment: Hi: Apply signal input to the limit you wish, adjust H.L. pot until HL. LED and/or relay/ O.C.T. just turns "ON" and back down ¼ turn or as required, varied the input signal to verify proper set point operation. The H.L. will operate (relay switch, LED turn "on" and O.C.T.). Go LOW when the input signal is greater than the set point, plus hysterisis of about 0.5% of setting. Lo: Do the same as for the hi limit but the Lo limit will operate when the signal is smaller than the set point and hysterisis.

(7.) Calibration: If recalibration is required, ALWAYS calibrate the ZERO, then the SPAN, then the Set Points! Unless range change is required.

(8.) Range change: If range change is required ALWAYS remove signal input first, change switches per table then do ZERO, SPAN, and Set Points. The Range Switch only applies to V/mADC and NOT to signal conditioners. See ordering information and part number on instrument.

(9.) For models with Serial I/O calibration refer to Serial Input Calibration.

(10.)(#) = Terminal # on TS2 connector. For edge card connector us #1-18.