NEW! PRELIMINARY

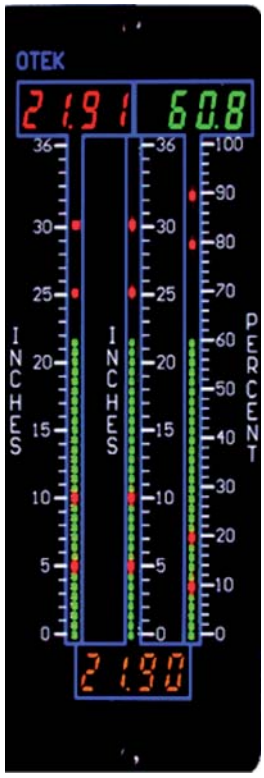
ISOLATED TRIPLE BAR-DIGITAL CONTROLLER WITH USB/232/485/ETHERNET I/O & MICRO SD CARD FOR NUCLEAR, MIL-STD & INDUSTRIAL USE

MODEL TBD

FEATURES:

*3 Ea. isolated 14 bit A/D with 51 segment auto tricolor bargraph & 4 digits
*Metal case ready for EMI/RFI compliance (Mil-Std 461)
*Shock & Vibration (Mil-Std 617) Ready
*>30 Input Signals & >5 Power Inputs
* uSD For Data Logging
*USB, 232, 485, ETHERNET I/O
*High Speed (>20Khz) Peak & Hold (Opt'l)
*Isol. 28VDC Power for XMTR (Opt'l)
*Up/Down or Center Zero Bargraph
*12 Relays or Open Coll. Transistors (4 per Channel)
*Isolated Analog Out (4-20mA/0-5 VDC)
*Remote Display For SCADA/DCS
*Front Panel or Serial Zero & Span
*NEMA 3 Case Only 3" Deep
*Math Function, Polynomial & X-Y Tables
*Lifetime Warranty.

(Actual size is 3"x 6")



SPECIFICATIONS (@ 25°C)

NOTE: All 3 channels isolated from each other and power input.
(See options description)

•Accuracy & Linearity: ±0.01% of F.S.
•Bargraph Resolution: 2%
•Span & Zero Range: ± 3000 Counts
•C.M.V. - Signal to - Power: 2VDC Max.
•Digits: 0.2", 4 (9.9.9.9) Floating D.P.
•Temperature Coefficient: 50 PPM
•Op. /Storage Temp: 0-60/-20 + 80°C
•Power Consumption: 2 Watts @ 5VDC + Options
•Environmental: NEMA 3 , 5-95% RH
•Case: All Metal Machined or 94VO
•**CMTBF:** 100,000+ Hours
•Relays: 1 Amp 120VAC/30VDC (4) SPDT or O.C.T.: 30V/30mA
•Analog Out: 16 Bit ± 0.01%
•Serial I/O 300-19.2KB (8N1 Setting)
•All ASCII I/O; Address: 10^{34} (>10^{34})

DESCRIPTION:

A nuclear customer liked our model "**EBD**" and gave us the challenge to put 3 isolated channels in one case, make it to military standards 461 & 617 (Epri TR-102323R3) and keep the case< 4 inches deep! Now you can benefit from their need, **OTEK**'s ingenuity and over 35 years experience in high quality instrumentation and its unique lifetime warranty.
Some features include:

***ANALOG INPUTS:** >30 Signal conditioners. (See ordering information on P.6)

***MATH FUNCTIONS:** Polynomial (9th), RTD, TC & X-Y linearization plus Tare, Offset, Scale, Peak and more are programmable via simple command.

***CONTROL OUTPUTS:** 4 each relays or 4 open collector transistors for High, High-High, Low and Low-Low Control of each channel.

***POWER OUTPUT (28 VDC) FOR 4-20mA XMTR**

If You Don't See It, Ask For It!

LIFETIME WARRANTED!

***ANALOG OUTPUT:** Optional isolated 4-20mA, 0-1mA, 0-20mA or 0-5VDC with 16 Bit resolution.

***SERIAL I/O:** RS232, RS485, USB or Ethernet.

***POWER INPUT:** Standard is 3 isolated 5VDC or common isolated 10-32VDC, 100-240VAC or USB powered.

***DISPLAY:** The 51 segment automatic tricolor bargraph can be programmed for any direction (up or down), any start (bottom, top, middle), colors change as limits are reached or exceed.

***DATA LOGGING:** Removable µSD memory card up to 8 gigabytes.

Think of the possibilities!
*Triple Redundant Controller
*Any 3 input process: V/A/Hz/W; C°/#/G; pH/C°/Hr; etc.

Tel: 520-748-7900 Fax: 520-790-2808
Toll Free: 877-BAR-OTEK (227-6835)
E-Mail:sales@otekcorp.com
Web:www.otekcorp.com

OTEK™ CORP.
Since 1974

4016 E. TENNESSEE ST.
TUCSON, AZ. 85714 U.S.A.

MADE IN U.S.A.

TBD SERIES

We use our series "SC" signal conditioners (~1"x 1") so we can mix and match any offered combination, but only 3 maximum/instrument. (See note 1 in ordering informa-

THE SIGNAL CONDITIONERS:
(2nd & 3rd Digits)

Option 00: 4-20mA Input:
a 50 Ohm 1% resistor is used as a shunt. Don't connect/disconnect the signal without limiting the current (max 50mA<1 second).

(2nd & 3rd Digits): Options 04-08:

Input impedance is 1 Mega Ohms on all VDC ranges.

(2nd & 3rd Digits):
Option 09: Custom: Use this option to describe any custom input, scale or modification to the **TBD** and contact us for feasibility and cost.

(2nd & 3rd Digits): Options 10-13: 200µA - 200mADC:
Since the **TBD** is 200mV full scale (2,000 Counts) the "Shunt" resistors used are 1K, 100, 10 or 1 Ohm.

Accuracy: ±0.05% of F.S.

(2nd & 3rd Digits):Options 14-22:
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 fired to ± 2%. Input impedances vs. range are the same as for VDC & mADC ranges. **Warning: No Isolation!**

(2nd & 3rd Digits): Option 23: 5Amps AC:
Specifically for current transformers (**C.T.**) this option requires an externally mounted (supplied) 0.05 Ohm, 0.1% 5 Watt resistor. You
can mount the "Shunt" at your **C.T.** or next to the **TBD** but make sure the connections are "Perfect" to electrical codes. The C.T. might have **"Lethal" High Voltage** without a "Shunt" (Open) and the **TBD** will "Smoke". See OTEK's New **ACS** & **CTT** models for **C.T.** powered instruments (Patent Pend.)

(2nd & 3rd Digits): Option 24: Strain-Gage (350 Ohm Type): Here we use a "tracking" ± excitation of ±2.5VDC and a differential amplifier to convert the 2 or 3mV/V (typical) sensitivity of your "Loadcell". ***Specify*** your Strain-Gage sensitivity and full scale and the **TBD's** display at Zero and Full Scale Please!

Accuracy: ±0.05% of F.S.

(2nd & 3rd Digits): Option 25: Strain-Gage (≥1K < 5K Ohm): These are typically "Monolithic" **S-G** that require constant current (preferably) excitation. We use 100µA and diff. op. amp for high stability and accuracy. **Specify** your S-G impedance and sensitivity and the **TBD's** display at Zero and Full Scale.

(2nd & 3rd Digits): Option 26: RTD (PT100): We excite your 2 , 3 or 4 wire RTD with 200µA to avoid the "self heating" effect. The range of the **TBD** 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 legacy 0.00392 TC (known as ANSI 392) contact **OTEK** and use Option "09".)
Accuracy: ±0.5% of F/C plus sensor's error.
Note: For 2 wire, jump - S to -E and +S to +E. For 3 wire only jump -S to -E.

(2nd & 3rd Digits): Option 27: RTD (PT1000): Same as PT100 except it is 1000 Ohms at 0^{0}C instead of 100 Ohms @ 0^{0}C. The same technique is used for copper **RTD** (10 Ohm), contact **OTEK**. Same connection as Option 26 apply.

Accuracy: ±0.05% of F/C plus sensor's error.
Note: For long distances use a 4-20mA transmitter such as our 900 or LPX series.

(2nd & 3rd Digits): Option 28: 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 **TBD** at the connector base. Make sure the connections from the **TBD** and your **TC** are as close to the **TBD's** entrance as possible to avoid errors. If you short out the **TBD's** +**TC** & -**TC** together, the **TBD** will read the ambient temperature due to its built-in C.J.C.

Accuracy: ± 2^0 F/C of signal input.

(2nd & 3rd Digits): Option 30: TC (Type K): This is yellow (+) and red (-) and has a range of -270 + 1370^{0}C (-440 + 2500^{0}F). The same notes as Option 28.
Accuracy: ± 2^0 F/C of signal input

(2nd & 3rd Digits): Option 31: TC (Type T): This blue (+) and red (-) **TC** wire has the range of -270^0 + 400^{0}C (-440 + 750^{0}F). Same notes as Option 28.

Accuracy: ± 2^0 F/C of signal input.

(2nd & 3rd Digits): Options 32-33: 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 or 60Hz power line frequency measurement. Use Option #"33" or see our **ACS** Powerless^{TM} Series.

(2nd & 3rd Digits): Option 34: %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.
Accuracy: ± 2% RH of signal input.

(2nd & 3rd Digits): Option 35: pH (Acidity): We use a FET input (10^{15}) amplifier and calibrate the **TBD** for 0-14.00 pH using the Industry's standard ± 413 mV = ± 7pH coefficient.
Note: Not temperature compensated.
Accuracy: ±0.05% of F.S.

(2nd & 3rd Digits) Option 36: ORP (Oxygen Reduction Potential): Our FET amplifier (10^9) accepts the industry standard 2000mV F.S. of the probe and the **TBD** displays it in % (0-100.00%).
Accuracy: ±0.05% of F.S.

(2nd & 3rd Digits): Option 36: ORP (Oxygen Reduction Potential):
Our FET amplifier (10^9) accepts the industry standard 2000mV F.S. of the probe and the **TBD** displays it in % (0-100.00%).
Accuracy: ±0.05% of F.S.

(2nd & 3rd Digits): Option 37: 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).

Serial I/O: (4th Digit)

Note: All set for 9600 Band (Programmed)

Option "0": No Serial I/O: Only options 0, 5 or 6 on digit 6 are available when option "0" is selected.

Option 1: RS2323: 1200-19.2kb, all ASCII (8N1) open protocol "DB9" connector

Option 2: RS485: 1200-19.2kb, all ASCII (8N1) open protocol screw "conn."

Option 3: USB: 1200-19.2kb, all ASCII (8N1) open protocol "USB Type B." Driver included at www.otekcorp.com/support-downloads.htm

Any terminal program (Hyperterminal, Procomm, Kermit) will work with OTEK's serial com. ports. For USB download our Driver at www.otekcorp.com/Support/Downloads.

Option 4 (Ethernet): Fully compliant 10 baseT, RJ45 connector. Free Drive

Option 5 (Micro SD Memory Card): Automatic log of all data as configured via the serial port. The TBD can store up to 8 gigabytes of data. The µSD is pluggable on the rear.

(5th Digit): Option 0: Non-Isolated 5 VDC Power:

All listed I/O options are available. Power requirements vary with options included. The **TBD** with No Control and Power Out (Digit 6, Option 0) requires under 150 mW (30 mA@5VDC) per channel. Please add all the options power to this basic power

(5th Digit): Options 1 & 2: Isolated Power
These options offer minimum isolation of 500 VAC or DC and their efficiency is about 80%. Again, add all the options. Selected power x1.2 to arrive at total power required. All input ranges

Control & Power Out (6th Digit):

Option 1: Relays (4): Standard outputs are SPDT of all 4 relays. For N.C. of all 4 relays (for Hi, Hi Hi, Lo & LoLo). Contacts are rated at 1 amp at 120 VAC/30 VDC resistive load. Also applies to option 5 & 7 (Relays). Power required by each relay is 200 mW (40mA@5VDC) x 4=800 uW. (Contact OTEK for 10 A contacts). For 10 amp contacts (2 relays) use #9 and specify.

(6th Digit): Option 2: Open Collector Transistors (O.C.T):

Four O.C.T are included and all are common emitter (sinking) to digital ground (terminal TS1-2). The 5 VDC internal powers is available at terminal TS1-1. Maximum current allowed per O.C.T. (From the internal 5 VDC) is 20mA/O.C.T. if external VCC is used, the maximum VCE is 30 VDC and 30 mA per O.C.T. Switching time is under one (1) uSecond.

(6th Digit): Option 3: Isolated 4-20 mA: (Must include serial I/O options 1-3 Digit 4)

This option is offset & scaled via the serial port (digit 4) and can be configured for 4-20, 0-20 or 0-24 mA or 0-5 VDC via internal jumpers (standard is 4-20 mA).

This option requires under 200 mA@5VDC internal power due to step up from 5-30 VDC compliance. Accuracy & linearity is +/-.1% of setting and can

(6th Digit): Option 4: Isolated 30 VDC

You can use it to excite your transmitter at up to 25mA. It consumes under one (1) watt at full load. Also see Option A.

(6th Digit): Option 3, 5-8: Combinations of Options 1-4.
Don't forget to add all power requirements of each option desired.

(6th Digit): Option A: Non-Isolated 28VDC For Transmitters.

Note: Does Not Require Serial I/O

It converts the internal 5 VDC to 28 VDC and requires under 0.8 watts@5 VDC with max current output of 25mADC.

(6th Digit): Option B: Non-Isolated 4-20 mA Out.

Note: Does Not Require Serial I/O

This option converts the **TBD** to a low-cost transmitting DPM. The output is referenced to the **TBD's** Signal input after it has been conditioned by the signal conditioner (such as strain-gage, Hz, PH, etc.), and it has its own zero and span potentiometers for your customized range. Standard connections are for sourcing with burden under 700 ohms @ 20 mA. For external compliance and sinking, select option #9 and specify "external compliance" (you supply the VDC power for the 4-20mA transmitter). Minimum voltage is 10 VDC plus your load. Max is 30 VDC plus your load. Accuracy and linearity is +/- 0.05% of full scale. Power requirement is 800mW@5VDC internal compliance or 50mW with external (yours) compliance.

(7th Digit): Option 0: Plastic 94 VO Black (Not for Mil-Spec. or Nuclear)

Option 1: Aluminum machined, nickel plated ready for Mil-Std. 461 (EPRI TR-102323R3)

Mounting Instructions:

1. Remove filter.
2. Slide TBD in panel and twist lock the tabs until secured.
3. Replace filter.

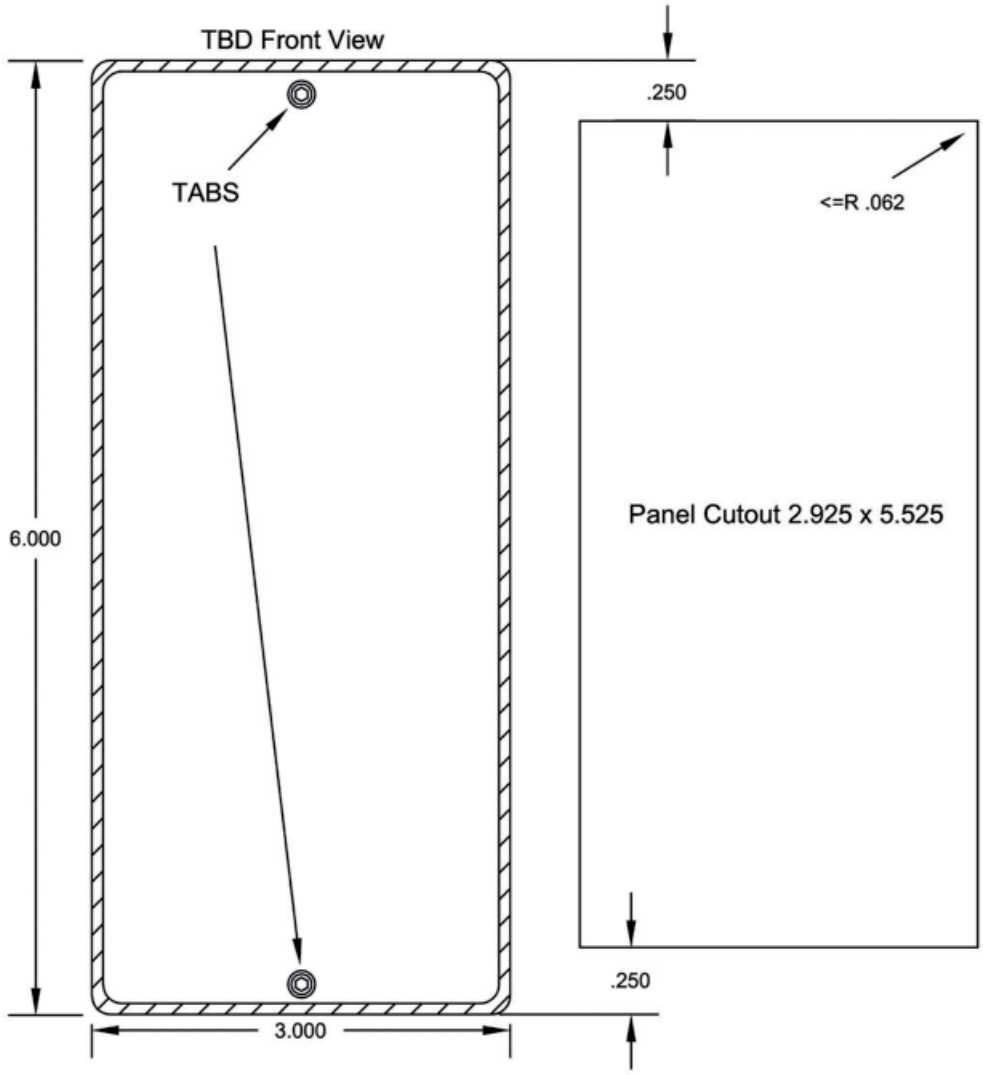
Tel: 520-748-7900 Fax: 520-790-2808
Toll Free: 877-BAR-OTEK (227-6835)
E-Mail:sales@otekcorp.com
Web:www.otekcorp.com

OTEK™ CORP.
Since 1974

4016 E. TENNESSEE ST.
TUCSON, AZ. 85714 U.S.A.
MADE IN U.S.A.

TBD

MOUNTING: 1. REMOVE FILTER
2. TWIST MOUNTING TABS (2) CLOCKWISE
3. REPLACE FILTER



REV:	DATE
A	10-08-09
B	1-15-10

OTEK
4016 E. TENNESSEE ST. / TUCSON, AZ. 85714

TITLE: TBD Mounting

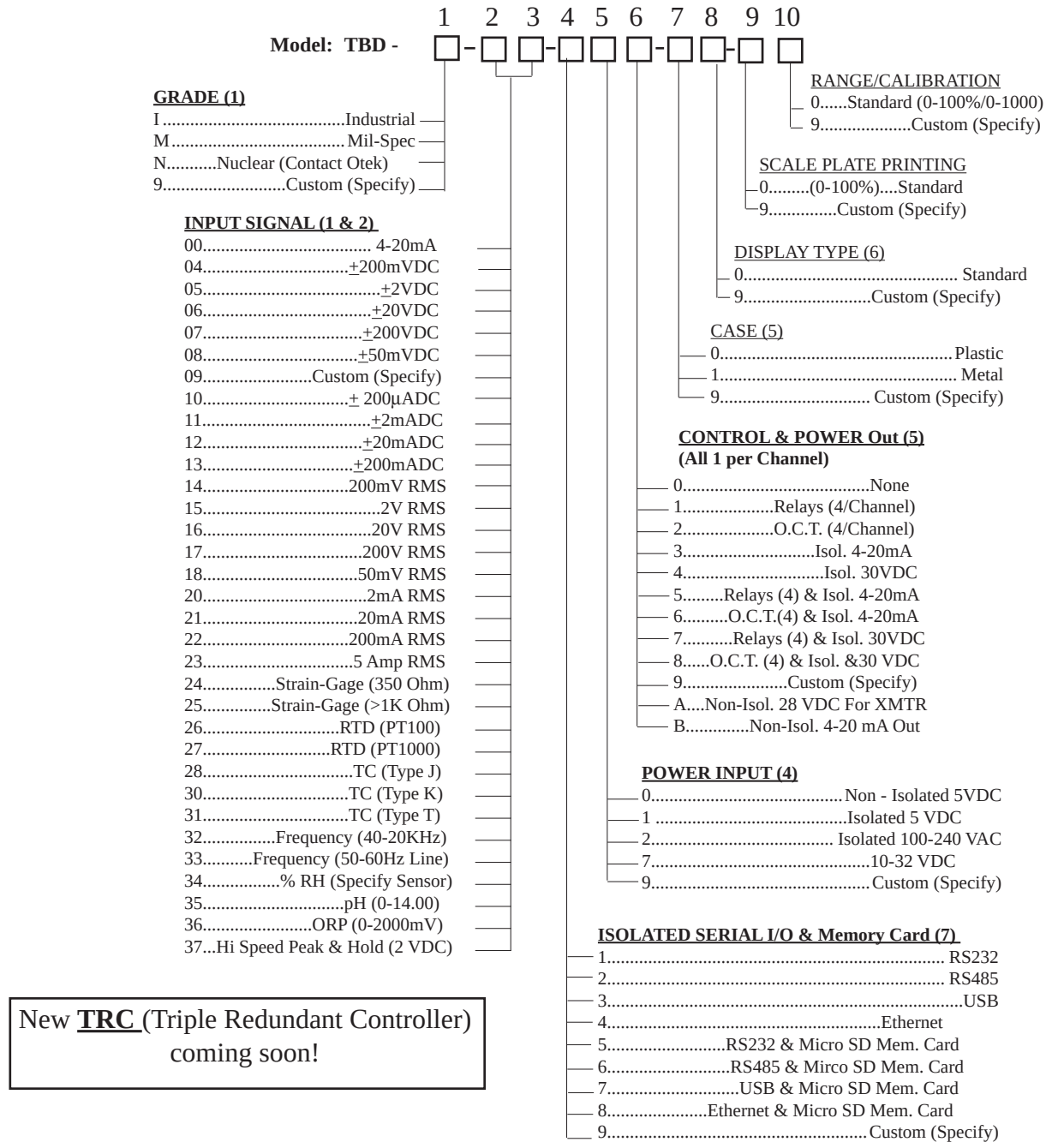
SCALE: NONE | DRAWN: NS | APPR:

DATE: 1-15-10 | DWG NO: 90-TBD-0.dwg

FORM #F-ENG-006 REV B

TBD SERIES

ORDERING INFORMATION 4-12-10



New **TRC** (Triple Redundant Controller) coming soon!

NOTES:

1. All 3 channels get same signal input. For mixed signals, use Option "09" and specify input option # vs. channel #. Channel 1 is left, #2 is center & #3 is right. Option 23 (5Arms) includes 3 each 0.05 Ohm 1%5W shunt resistor.
2. See "EBD" or HI-Q119 series for single channel & dual channel.
3. Serial I/O is isolated from signal. Must have serial I/O to implement processor's functions (if req'd).
4. Non-isolated 5 VDC (Option 1) eliminates isolation between channels & all I/O except relays & analog out. Max power Req'd.: 5 watts.
5. Control Outputs (Digit 6, Option 1-8) must order any serial I/O (Digit 4). As on Note 1, Digit 6, Options 1-6 get same outputs for each channel (i.e. 3 each 4-20mA out). For mixed outputs (i.e. Ch. 1, Relays, Ch.2, O.C.T. & Ch.3, 4-20mA) use Option 9 and specify. (subject to acceptance by OTEK). Options A&B are NOT isolated from input signals or internal 5V supply (Option 0 on Digit 5)
6. Std. display is 3 bars, 3 digitals per photo on front. For other configurations or # of bars/digitals or digital colors, use Option 9 and specify (subject to acceptance by OTEK).
7. Ethernet connector extends 1/2" beyond back cover.