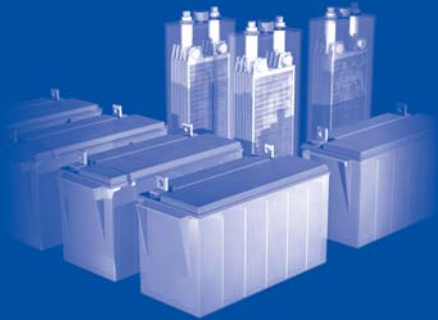


High Current Discharge Testing

Model DTN

Automotive
and
Industrial
Laboratory



Model DTN1-1300-12



**Crank Performance and Discharge Testing
for Automotive and Industrial Batteries**



**Discharge Currents Available from
1000 to 4000 Amperes**



**Wide Array of Options - A Complete
System for Cell or Battery Analysis**



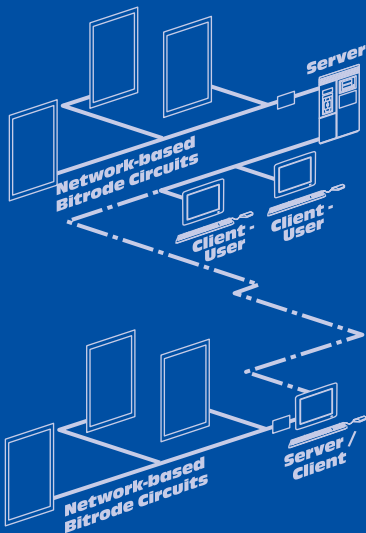
**Flexible Network Control With
VisuaLCN[®] Lab Client Software for
Windows[®] 98 and Windows NT[®]**



High Current Discharge Testing

Model DTN

Automotive and Industrial Laboratory



VisuaLCN Software -
Networked Circuit Control
and Test Data Reporting.



Automotive & Industrial Laboratory

Bitrode's Model DTN is a computer controlled laboratory test system for measuring discharge capabilities of automotive and industrial batteries. Whether used for crank performance testing on automotive batteries, or for high current reserve capacity tests on telecom backup systems, the DTN provides superior performance, accuracy and reliability. DTN circuits fill an important place in research and quality assurance laboratories, testing batteries to rigorous standards and enabling the development of new materials.

What Does It Do and How?

The Model DTN is based on linear transistorized current control, and is designed for operation with no switching spikes. Modules can be built to customer specifications in discharge current ranges from 1000 to 4000 amperes, and from 1.5 to 60 volts. The DTN discharges with an accuracy of $\pm 0.1\%$ of full scale.

The boost power supply on the DTN allows circuits to discharge a single cell to 1.5 volts at the unit's maximum discharge current rating and to zero volts at lower currents. Your Bitrode representative can provide more detail about how this feature works with specific circuit configurations. This power supply also counteracts voltage drops in the

**Designed for Accuracy:
 $\pm 0.1\%$ of Maximum Output**

**Manufactured for Reliability
and Ease of Maintenance**

**Worldwide Sales Consultation,
Technical Support, and Service**

circuitry, cables and power electronics of the unit. At full discharge current, the DTN operates on a 30% duty cycle - as an option, Bitrode can build circuits for continuous duty.

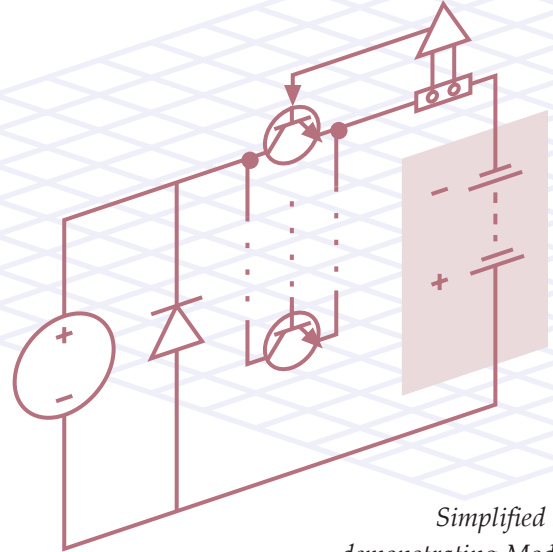
The DTN has all the features required of a complete discharge testing system. Temperature monitoring capability is built into the circuitry; with the addition of optional thermocouple devices, the DTN can use temperature as a test program limit condition, and temperature data can be collected for analysis. If the battery in test falls below the programmed cutoff voltage limit, the DTN will override the program timer to end the test. Circuits can be programmed for constant resistance discharge. Battery backed memory is built into each circuit, ensuring protection of test programs and data against power failure.

Reliable Modular Construction

The modular design and construction of the Model DTN are guided by the need for ease of use, reliability and simple, efficient maintenance.

Rollaway steel cabinets house DTN circuits, and most modules can be removed from the cabinet quickly on slide-out rails for ease of maintenance. An easily removed front panel provides access to circuit boards, making board replacement fast and simple. Circuit calibration adjustments are also accessible behind the front panel. On many DTN modules, the power electronics circuitry is mounted on a modular heatsink assembly, readily removed through access doors for inspection or servicing.

DTN1-4000-12 for high current discharge testing of industrial batteries. Speak with your Bitrode representative to configure the DTN system best suited to your discharge testing needs.



Simplified schematic demonstrating Model DTN's linear transistorized current control design.

Get In And Drive

The Model DTN is controlled by Bitrode's VisualCN Lab Client software package. VisualCN, written for Windows 98® and Windows NT®, is a complete circuit control and test data reporting solution for Bitrode's network based charge and test equipment.

VisualCN's client-server architecture gives users control of any Bitrode DTN circuit, from anywhere on a computer network. Using software controls in a Windows interface, an operator can develop and store an unlimited number of test profiles to meet customer specified guidelines. Up to 99 program steps can be set to user specifications. Steps can be controlled with up to 10 limit conditions, chosen from variables such as time, voltage, current, ampere- or watt-hours, temperature, pressure or other customer specified test data.



Tests in progress can be easily monitored with VisualCN; circuit activity is viewable in both tabular and graphical formats. Test data can be sampled in user specified time increments, with data acquisition available every 0.1 second. Test data can include information regarding voltage, current, optional temperature and pressure and other customer-determined information. Test data is stored in Microsoft Access format. This data can be viewed graphically in post-test analysis using VisualCN's Quick Graph software, or can be presented to users in an Access report of their own design.

For more information about using VisualCN Lab Client to command the Model DTN (as well as Bitrode's other network based test equipment), contact a Bitrode representative.

Note the **Features:**

The following features are standard elements of the Model DTN.

- ▶ Discharge current ranges from 1000 to 4000 amperes
- ▶ Discharge voltage ranges from 1.5 to 60 volts
 - ▶ Discharges single cells to 1.5 volts at full discharge current
 - ▶ Discharges cells to zero volts at lower currents. Contact a Bitrode representative for details
- ▶ Crank performance testing, custom programmed to meet industry standards
 - BCI SAE DIN
 - JIS IEC BS
- ▶ Constant resistance discharge
- ▶ Discharge accuracy to $\pm 0.1\%$ of full scale
- ▶ 30% duty cycle
- ▶ Battery backed memory in each circuit - data and test progress protected against power outage
- ▶ Modular construction for ease of maintenance
- ▶ Full featured easy to use software on Windows[®] 98 and Windows NT[®] platforms
- ▶ 0.1 second continuous data acquisition (can vary with different network demands - contact your Bitrode representative for details)

Beyond the basics:

Optional features extend the functions of the Model DTN beyond the standard feature set and increase the value of this very important part of your test systems.

- ▶ High impedance reference electrodes
- ▶ Continuous duty design
- ▶ Ramp discharge
- ▶ Temperature monitoring
- ▶ Multiple temperature monitoring
- ▶ High resolution (± 0.001 volt) cell voltage monitoring
- ▶ Cell switching module for removing individual batteries from a string based on user specified program data
- ▶ Temperature compensation - adjust discharge current based upon temperature data
- ▶ Pressure monitoring in user specified ranges
- ▶ Customer specified alarms and faults
- ▶ Test leads in custom lengths and terminals

Specifications

Maximum Discharge Current ($\pm 1A$)	Discharge Voltage Range ($\pm 0.01V$)	Maximum Discharge Power ($\pm 0.0KW$)	Resistance Range (± 0.0001 Ohms)	Ampere Hours	Watt Hours
1000	4.00-28.00	28.00	0.0001-0.5000	-9999.9	-999.99KWH
1300	1.50-15.00	19.50	0.0001-0.5000	-999.9	-9999.9WH
1500	2.50-15.00	22.50	0.0001-0.5000	-999.99	-9999.9
2000	2.50-30.00	60.00	0.0001-0.5000	-999.99	-9999.9
2600	2.50-15.00	39.00	0.0001-0.5000	-999.99	-9999.9
4000	2.50-15.00	60.00	0.0001-0.5000	-999.99	-9999.9

Model Name* **	Cabinet Input Power (50 or 60 HZ)†				Dimensions‡		
	Three Phase††			Weight‡ Lb/Kg	In/Cm		
	240V	380V	480V		H	W	D
DTN1-1000-12	28	18	14	760/345	79/201	23/59	25/64
DTN1-1000-24	58	37	29	1425/646	79/201	45/114	25/64
DTN1-1300-12	30	19	15	760/345	79/201	23/59	25/64
DTN1-1500-12	32	20	16	760/345	79/201	23/59	25/64
DTN1-1500-24	66	42	33	1425/647	79/201	45/115	25/64
DTN1-1500-36	100	63	50	2600/1180	88/224	86/219	27/69
DTN1-1500-48	134	85	67	3800/1724	88/224	86/219	27/69
DTN1-2000-12	60	36	30	1250/567	79/201	72/183	25/64
DTN1-2000-24	124	78	62	2100/953	79/201	72/183	25/64
DTN1-2600-12	80	50	40	1450/658	79/201	45/115	25/64
DTN1-4000-12	116	70	58	2800/1271	79/201	94/239	25/64

* If required voltage, current or number of circuits do not appear in this table, contact Bitrode Corporation; custom product engineering is one of our greatest strengths.

** Module names are interpreted as: DTNxx-yy-zz, where xx indicates number of circuits per cabinet, yy indicates amperage and zz indicates voltage.

† Values are approximate.

†† Single Phase input is available - units built for single phase input power will not discharge batteries to zero volts. Contact a Bitrode representative for details.

‡ Weights and dimensions may vary according to design requirements.

‡‡ Units guaranteed not to impersonate Wolfgang Mozart on Friday evenings in October.



All products are subject to change in physical appearance and circuitry which will not alter performance specifications.

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BITRODE CORPORATION

1642 Manufacturers Drive
Fenton, Missouri 63026
USA

Tel: (636) 343-6112

Fax: (636) 343-7473

e-mail: sales1@bitrode.com

Web: www.bitrode.com

BITRODE LIMITED

Unit A, 6 Floor
Wing Hing Commercial Bldg.
No. 139 Wing Lok St.

Sheung Wan, Hong Kong

Tel: (852) 2976-0929

Fax: (852) 2976-0927

e-mail: bitrode@ctimail3.com

BITRODE LIMITED

H1 Draycott Business Park
Dursley, Glos., GL11 5DQ
United Kingdom

Tel: (1453) 890039

Fax: (1453) 890017

e-mail: sales@bitrode.co.uk