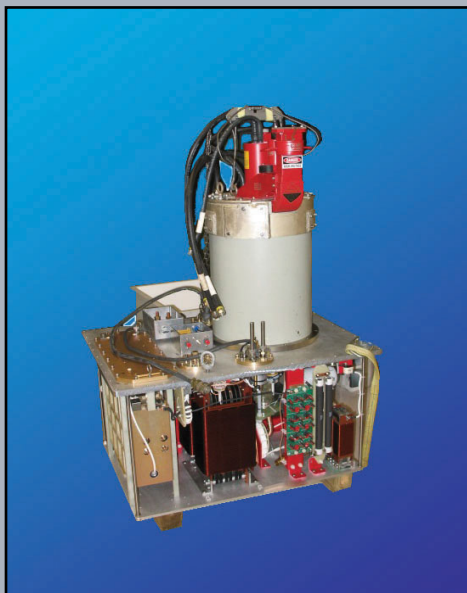
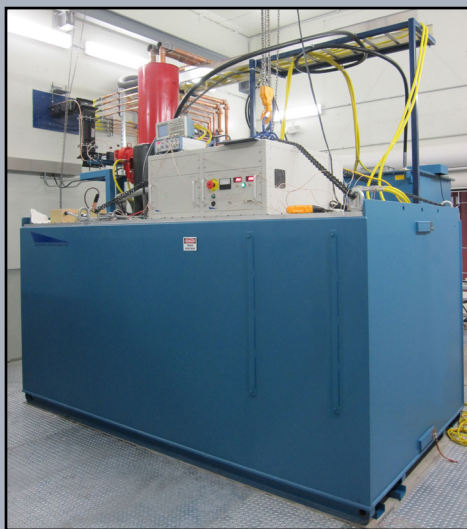


## SYSTEMS IN ACTION



**DTI Compact Klystron System.** This system, rated at 21 kW average power, eliminates the need for a crowbar and provides thousands of hours of reliable operation.



**DTI Commercial Klystron Transmitter System.** This system delivers up to 14 MW peak power with an average power of 500 kW.

## KLYSTRON MODULATORS AND TRANSMITTERS

DTI's PowerMod klystron modulator and transmitter systems deliver MW peak power levels at frequencies ranging from UHF to W-band. Employing either direct or hybrid (transformer-coupled) solid-state switching topologies, PowerMod klystron systems offer improved performance and lifetime with:

- Fast pulse rise and fall times
- Outstanding pulse stability
- Integrated fault detection with full, internal protection and  $\mu$ s response
- Compact size and weight
- High repeatability with low droop
- >90% efficiency
- Rugged design for years of reliable operation

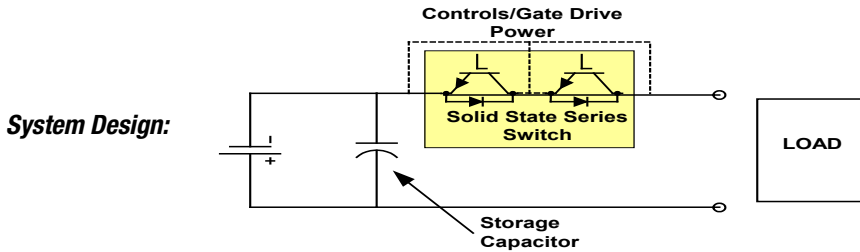
All DTI systems are fully customizable and may be optimized to meet strict size, weight, and pulse fidelity specifications. Systems may be designed as turn-key solutions to klystron needs, or integrated into existing equipment via upgrade kits. All systems are designed to fully address both EMI and safety concerns, and may be packaged in racks for laboratory use or in ruggedized environmental enclosures for more demanding applications.

Sample Klystron Systems				
Avg. Power	21 kW	25 kW	135 kW	500 kW
Peak Pulse Voltage	160 kV	140 kV	500 kV	140 kV
Peak Pulse Current	125 A	110 A	500 A	100 A
Pulse Width	1 - 5 $\mu$ s	3 - 10 $\mu$ s	1.5 - 3 $\mu$ s	10 - 300 $\mu$ s
Pulse Rise/Fall Time	< 2 $\mu$ s	< 1 $\mu$ s	< 600 ns	< 3 $\mu$ s
Pulse Flatness	< 2%	< 2%	< 1%	< 2%
Pulse Repetition Rate	1000 Hz	240 Hz	120 Hz	300 Hz
Additional specifications available upon request. All DTI Pulse Modulators are fully customizable.				

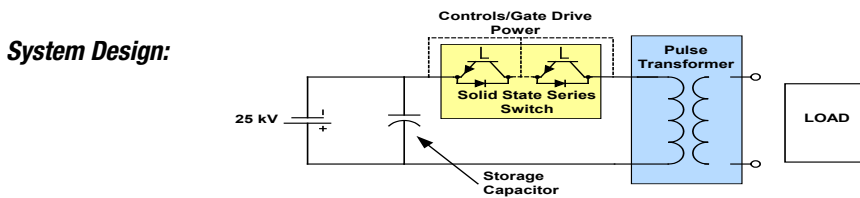
## PowerMod™ Design

DTI offers two types of klystron systems:

- A “direct-switched” solution. Using DTI’s compact, highly-regulated high voltage power supply and modulating switch, this type of system replaces cathode pulsed, “hard-tube”, active-switch modulators and thyatron-switched, line-type modulators.



- A “hybrid” modulator solution. Combining DTI’s advanced solid-state switches with a state-of-the-art pulse transformer in a very compact footprint, these designs are most cost-effective for low duty cycle systems. They deliver complex pulse trains, such as pulsed pairs and bursts, with extremely good pulse shape and stability for all pulses in a group.



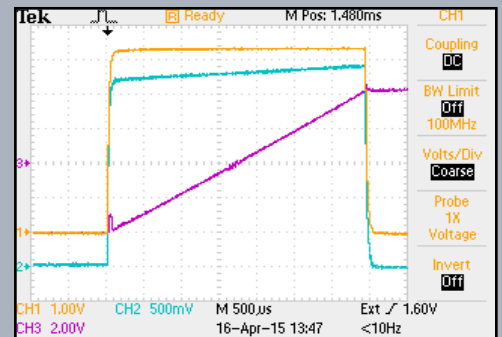
DTI’s pulse modulators behave as both closing and opening switches. In the event of arcing, the switch opens instantaneously, protecting both the load and modulator from damage. With no crowbar, no series resistor is required, leading to greater system efficiency. Further, the energy-storage capacitor does not discharge during an arc, so pulsing can resume immediately after the arc clears.

All DTI systems are built from patented, solid-state IGBT-based switching assemblies. Because IGBT switches always fail short, PowerMod modulators continue to operate, even if several switching assemblies fail.

## SYSTEMS IN ACTION



**DTI Klystron Transmitter.** This modular rack model gives greater system availability and klystron reliability than traditional designs, reduces the available arc energy, and simplifies mod-anode voltage control. This system operates at peak 100 kV and 50 A, with a pulse-width of 2 ms.



**Output pulse** from a Klystron modulator into a resistive load (100 kV, 42 A, 2 ms). Ch1 command 5V/div; Ch2 current 10 A/div.; Ch 3 voltage 22 kV/div.

