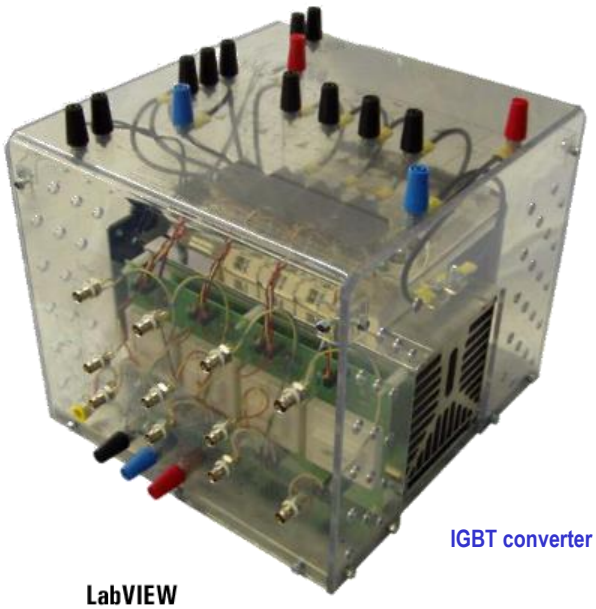
Didactic controller pack with separate control

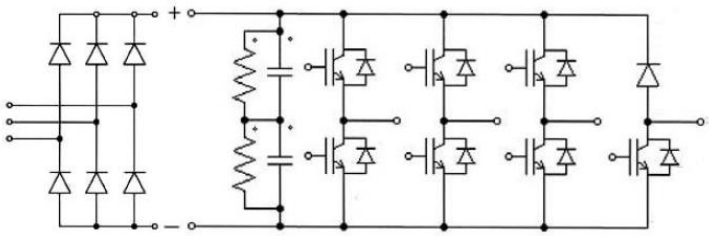
Multi-function IGBT converter with control unit for motor drive



IGBT converter

LabVIEW Real-Time
Graphical Development, Real-Time Results

NI unit for real-time control and acquisition (ref : IG10)



Architecture of the IGBT converter

Topics covered

Electrotechnics, Power electronics, Speed drive, Signal processing

Features

Control of electric motors is a frequent topic in industries. However, very few didactic systems allow the study of a speed controller operation.

To complement and expand your **practical works** and **experiments**, we propose a « **Didactic controller** » pack with professional, secure and totally configurable equipment.

The pack includes :

- ✓ **Multi-function IGBT converter** with 0-15V power supply **(ref : IG15)**
- ✓ Real-time control and acquisition unit **(ref : IG10)** to **generate your own IGBT control laws** (totally configurable)
- ✓ Pre-configured and modifiable control laws
- ✓ All necessary measurements for the analysis of components operation

A manual is included assisting students to familiarize with typical situations in the industrial applications.

Key points of the pack « Didactic controller »

The key strengths of the « Didactic controller » pack are :

- ✓ The topology of each semiconductor is **configurable** through cables or jumper connectors
- ✓ **Standardized connectors** (external banana for power and BNC type for control)
- ✓ The transparent enclosure allows the students to visualize and understand the purpose of each component of a power converter: power modules, gate drivers, DC filter, snubbers, heat sink and fan.
- ✓ **IP2x protection** to minimize safety hazards
- ✓ **Real-time control and acquisition unit**
- ✓ **Protection of the components** by the drivers (short-circuit detection and cut-off, power supply failure detection, interlock)
- ✓ **User protection** by galvanic isolation
- ✓ **User interface** easy-to-use**, 100% programmable** and designed for education
- ✓ **Total compatibility** with Leroy Somer 1500W rotating machines test bench

Content of the « Didactic controller »

Content of the IGBT converter (ref : IG15) :

- ✓3 dual IGBT modules
- ✓1 brake chopper IGBT module
- ✓1 3-phase rectifier module
- ✓1 capacitor bank 1100µF/800Vdc
- ✓ Snubbers
- ✓1 SKHI driver board (control and protection)
- ✓1 forced air-cooled heat sink
- ✓ Galvanic isolation

Content of the real-time control unit (ref : IG10) :

- ✓1 Real-time control and acquisition board
- ✓1 Control board for IGBT
- ✓1 User interface with pre-programmed control laws

Compatible motors

List of 1500W **motors pre-configurated for the Didactic controller pack :**

- ✓**LC00 / LC05 / LC01 / LC02 :** Squirrel cage 3-phase **asynchronous motors** 1500W
- ✓**LC04 :** Squirrel cage 1-phase **asynchronous motor** 1500W
- ✓**LC03 :** Self-controlled **synchronous motor** 1790W
- ✓**LC06 :** Separated excitation **DC motor** 1500W

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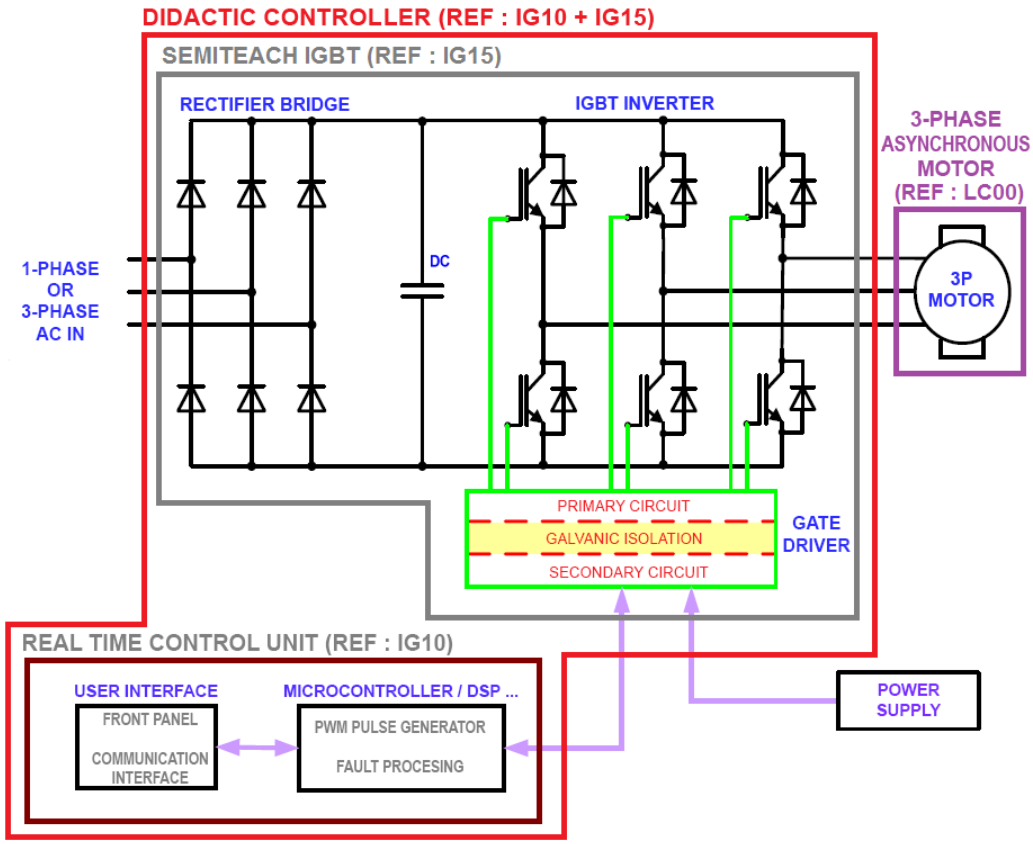
Multi-function IGBT converter with control unit for motor drive

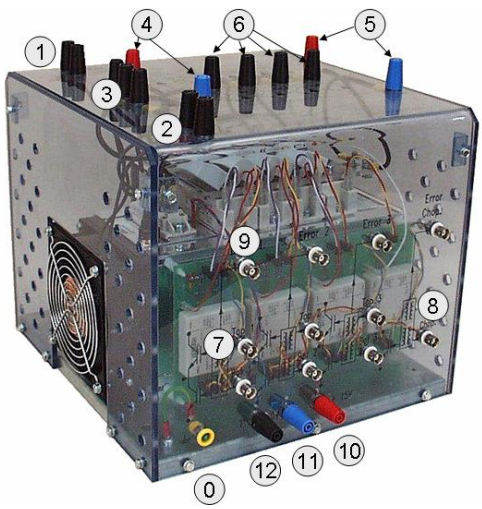
References

- ✓**IG15:** Multi-function IGBT converter, 0-15V power supply, with close control and protection device (possible application as a speed controller)
- ✓**IG10:** Real-time control and acquisition unit (NI SbRIO board), with Labview application for power electronics converters



Example: Control of a 3-phase asynchronous motor

N°	Function	Voltage level	Max Current level
0	Earth connection	0V	30 A
1	Fan power supply	230V/50Hz	1 A
2	Thermal trip	15V	5 A
3	Rectifier input	230 / 400V	30 A
4	DC rectifier outputs	600 VDC (Red is positive, Blue is negative)	30 A
5	DC IGBT inverter inputs	600 VDC (Red is positive, Blue is negative)	30 A
6	AC IGBT inverter + chopper outputs	400 VAC / 600 VDC	30 A
7	PWM input of inverter	C-MOS logic 0/15 V (shield is internally connected to driver's 0V), 0V =open IGBT, 15 V = closed IGBT	1 A
8	PWM input of brake chopper	C-MOS logic 0/15V (shield is internally connected to driver's 0V), 0V =open IGBT, 15 V = closed IGBT	1 A
9	Error output	C-MOS logic 0/15V (shield is internally connected to driver's 0V)	1 A
10	15V driver power supply	15V	5 A
11	0V driver power supply	15V	5 A
12	Temperature sensor	0-5V	1 A



IGBT converter

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