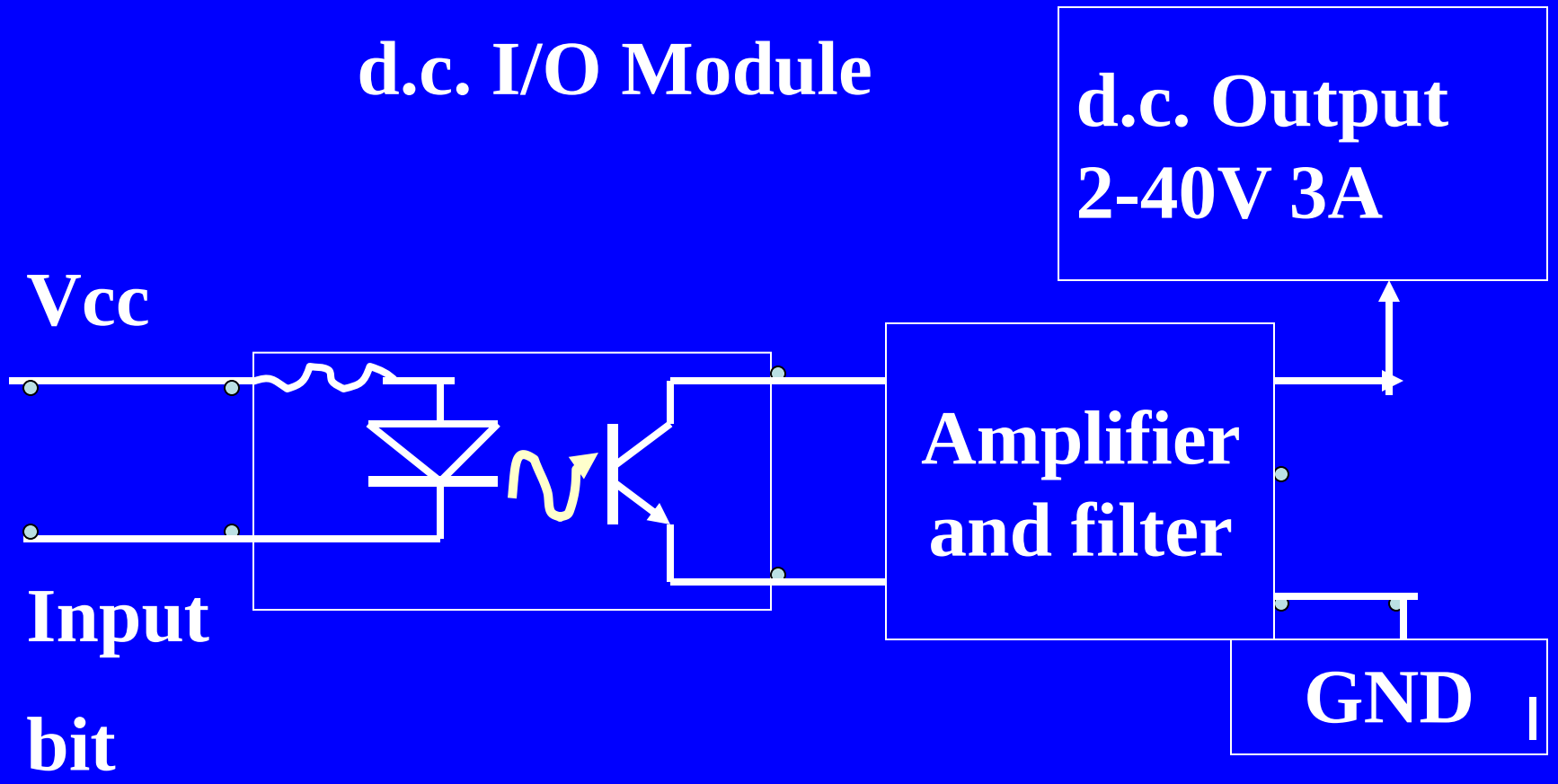
Chapter 8

Digital and Analog Interfacing Methods

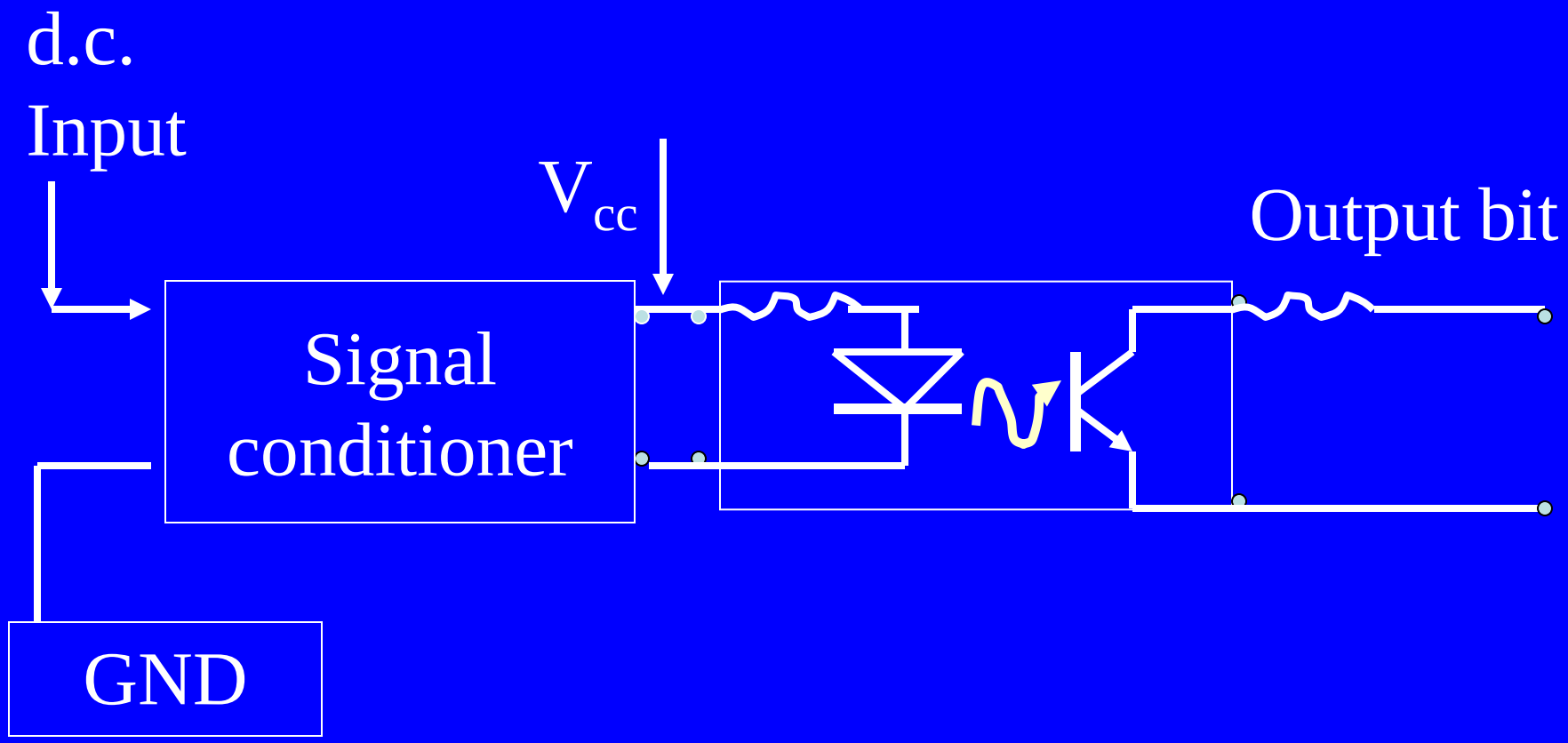
Lesson 10

Interfaces for the High Power Devices

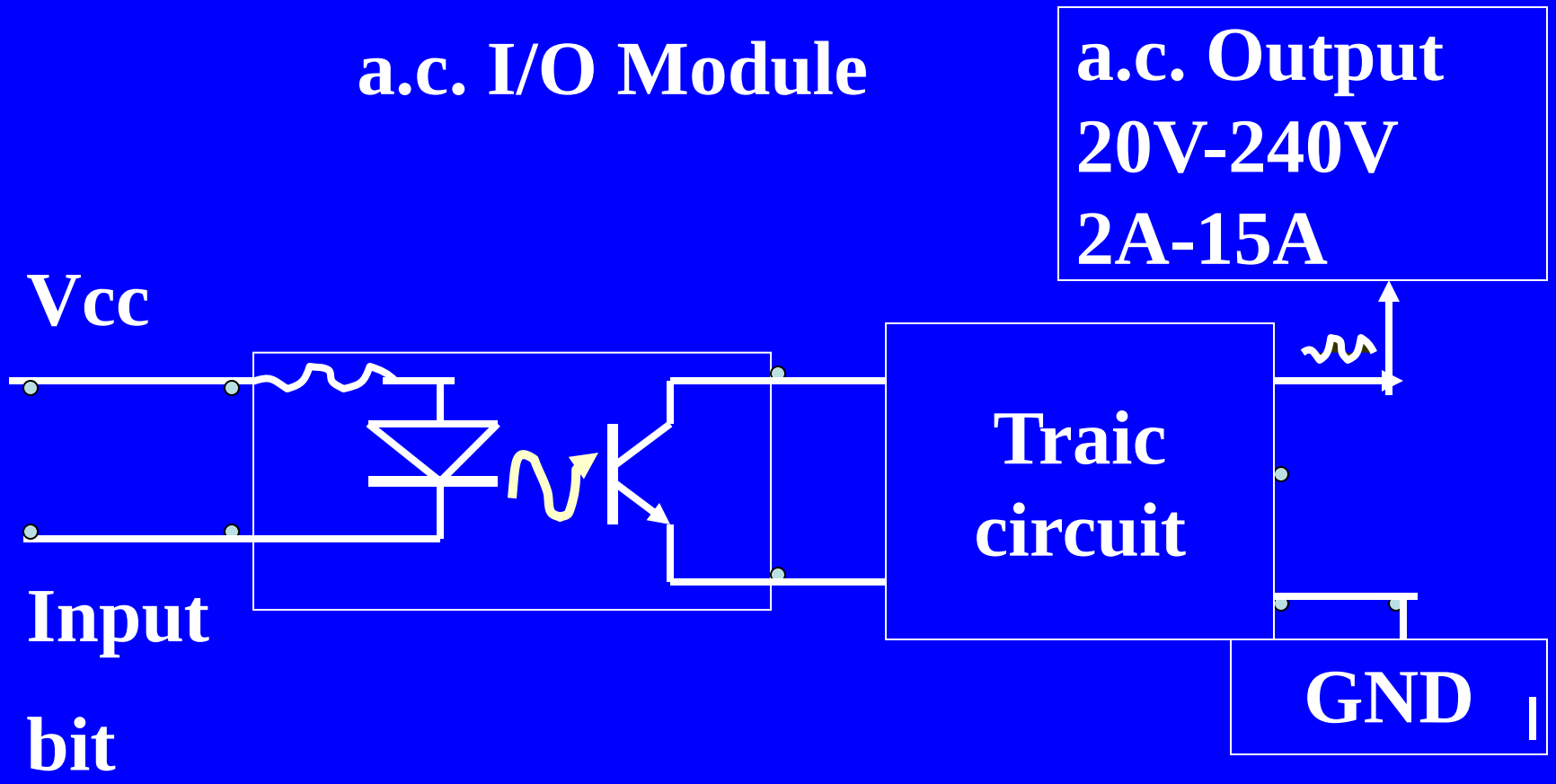
d.c. I/O Module



d.c. I/O Module

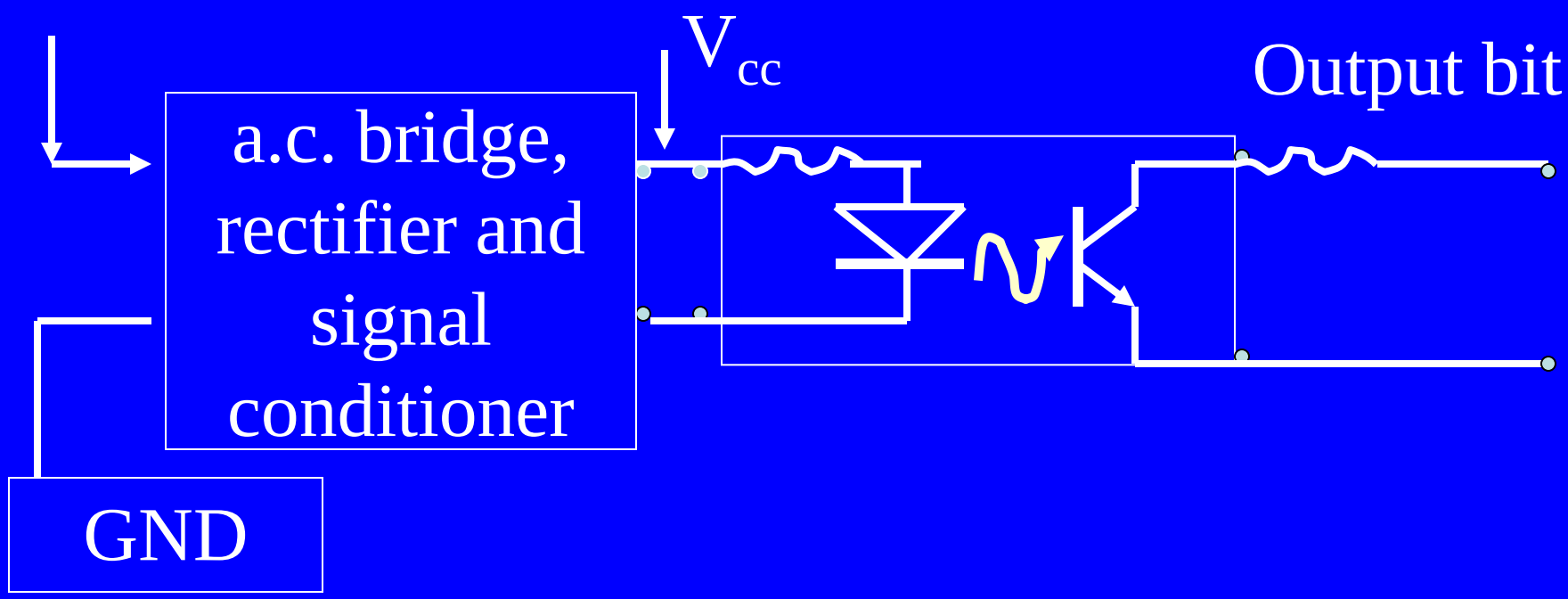


a.c. I/O Module



a.c. I/O Module

a.c. Input 20V-240V/ 2A source



I/O Module inner parts

- Opto-isolator,
- Amplifier,
- Input stage Signal conditioning amplifier or input stage bridge
- Output stage transistor or triac circuit

I/O Module Optical Isolation - Protection and Isolation

(1) Transient surges

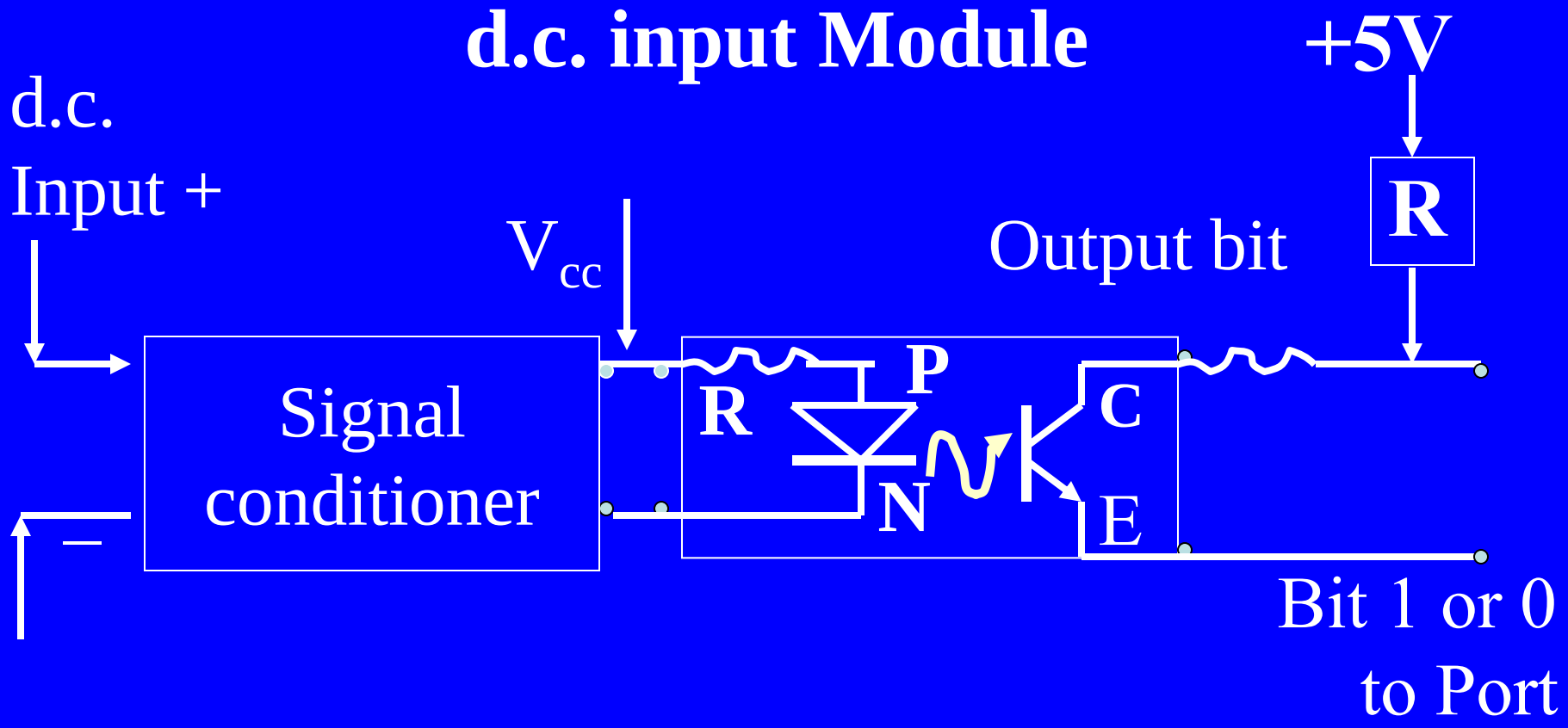
(2) Larger Signal inputs (For example, ~ 30V)

(3) Mistakes like an input shorted to the power line (220V or 110V)

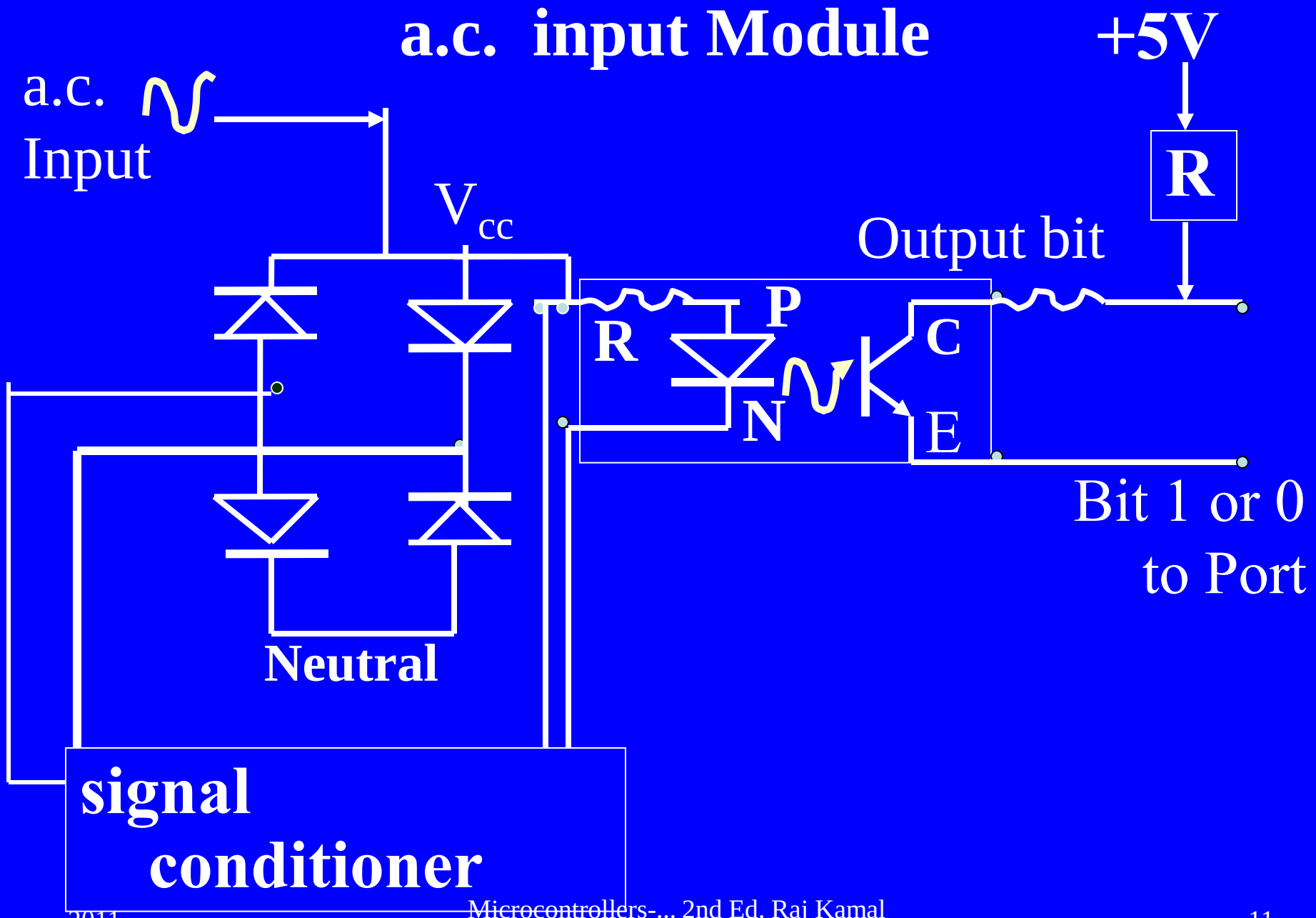
I/O Module Optical Isolation - Protection and Isolation

(4) Large Input Offsets, for example 440V

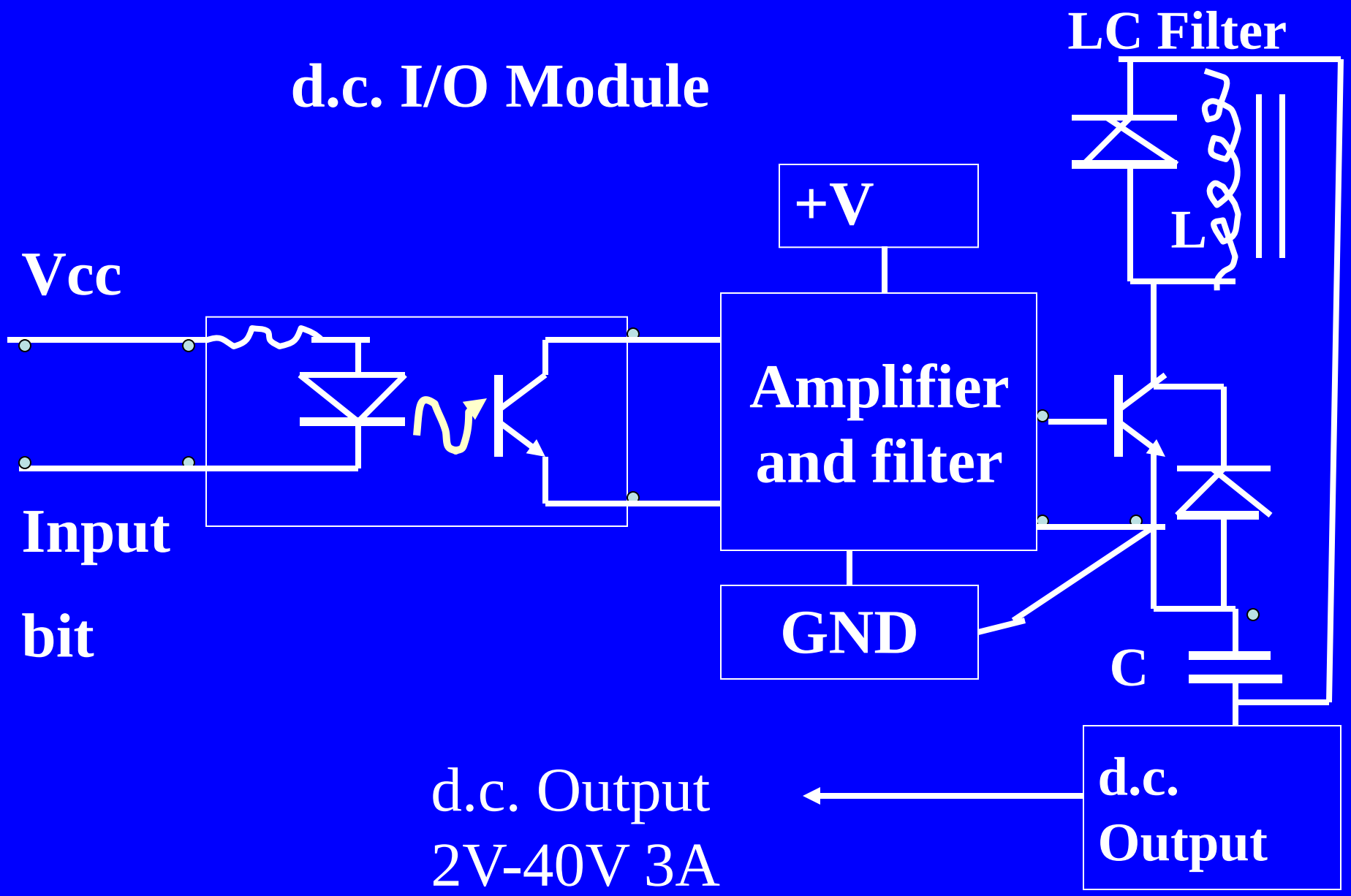
d.c. input Module



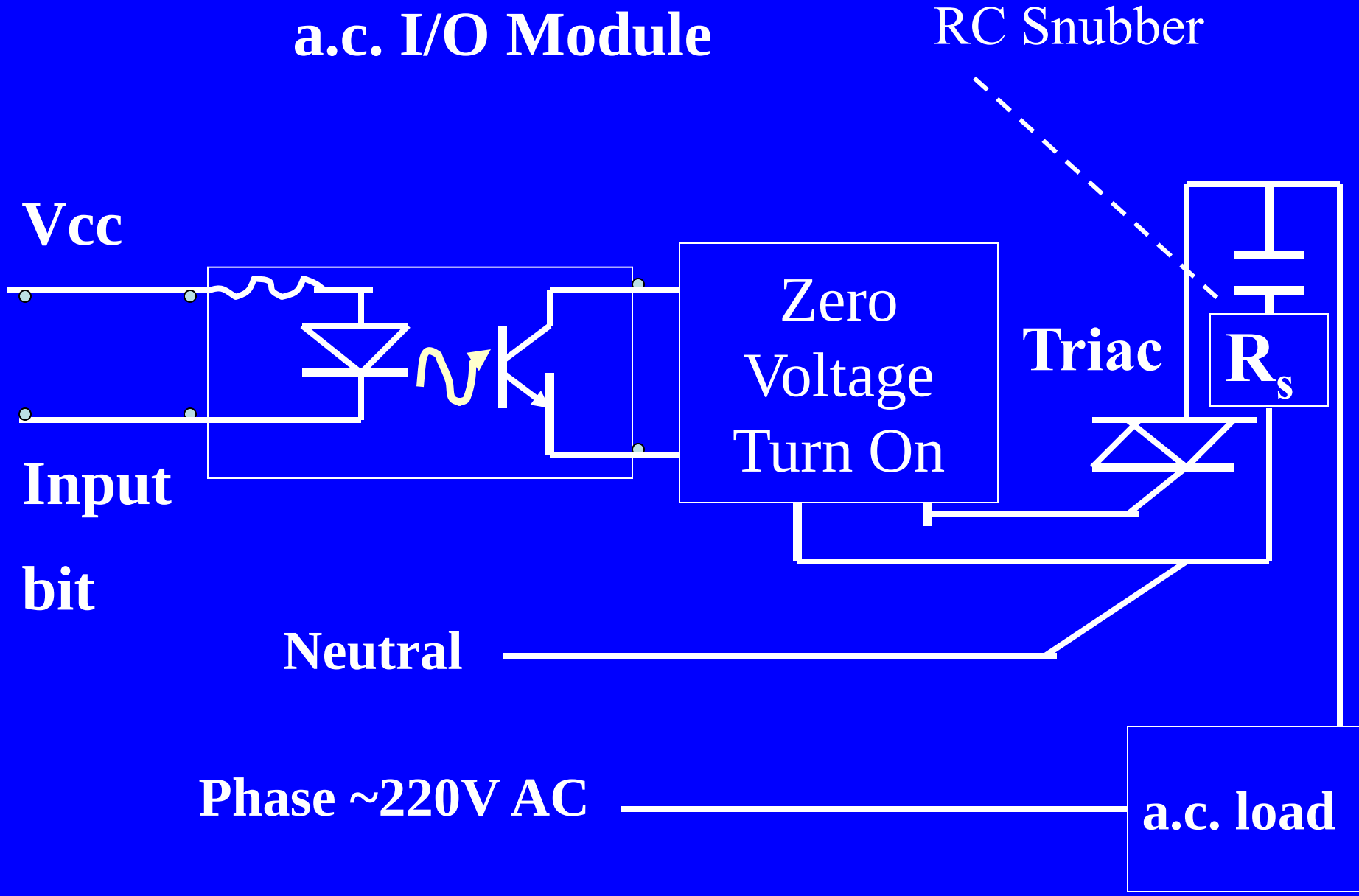
a.c. input Module



d.c. I/O Module

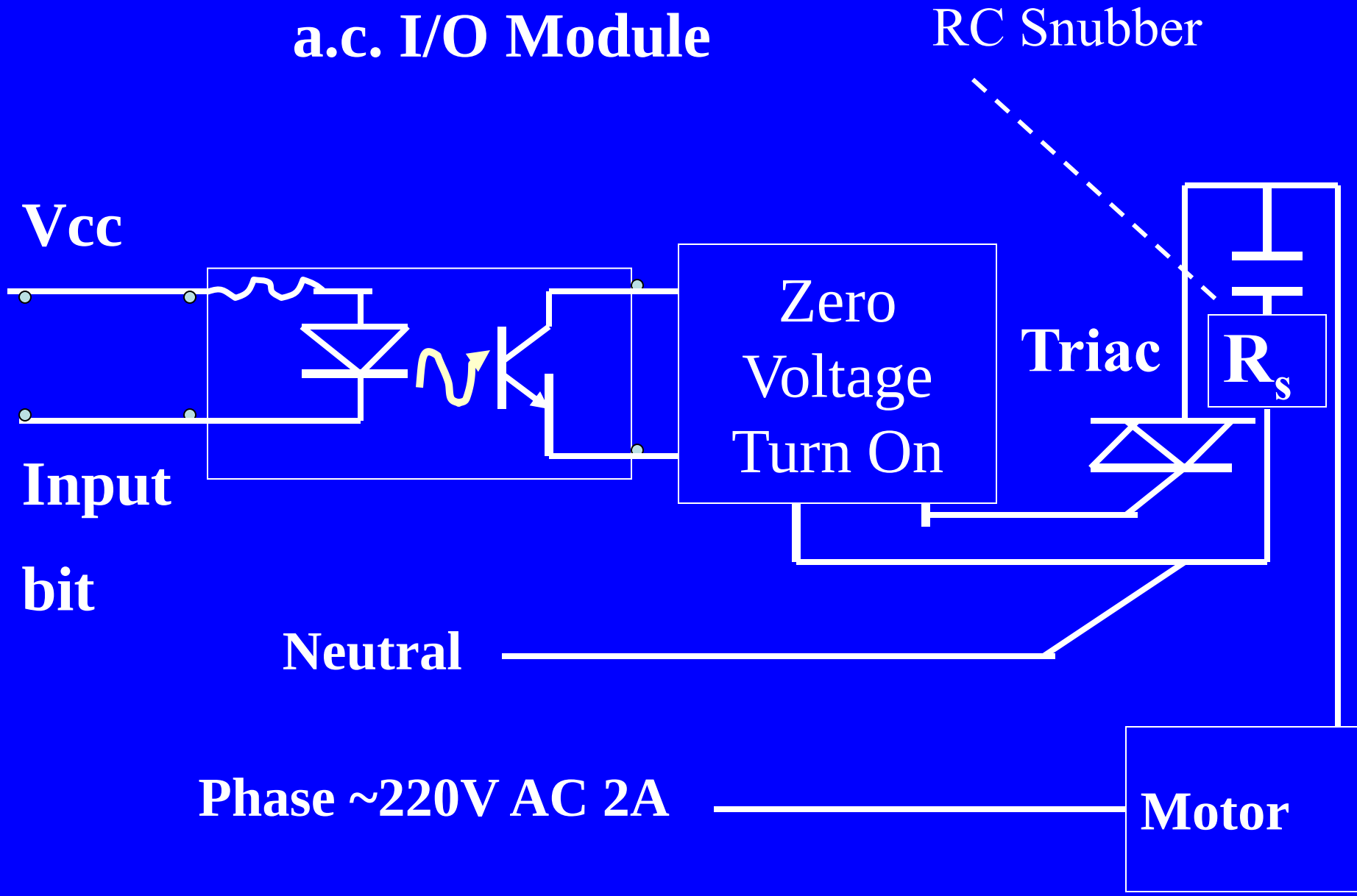

LC Filter
+V
L
Vcc
Amplifier
and filter
Input
bit
GND
C
d.c.
Output
d.c. Output
2V-40V 3A

a.c. I/O Module

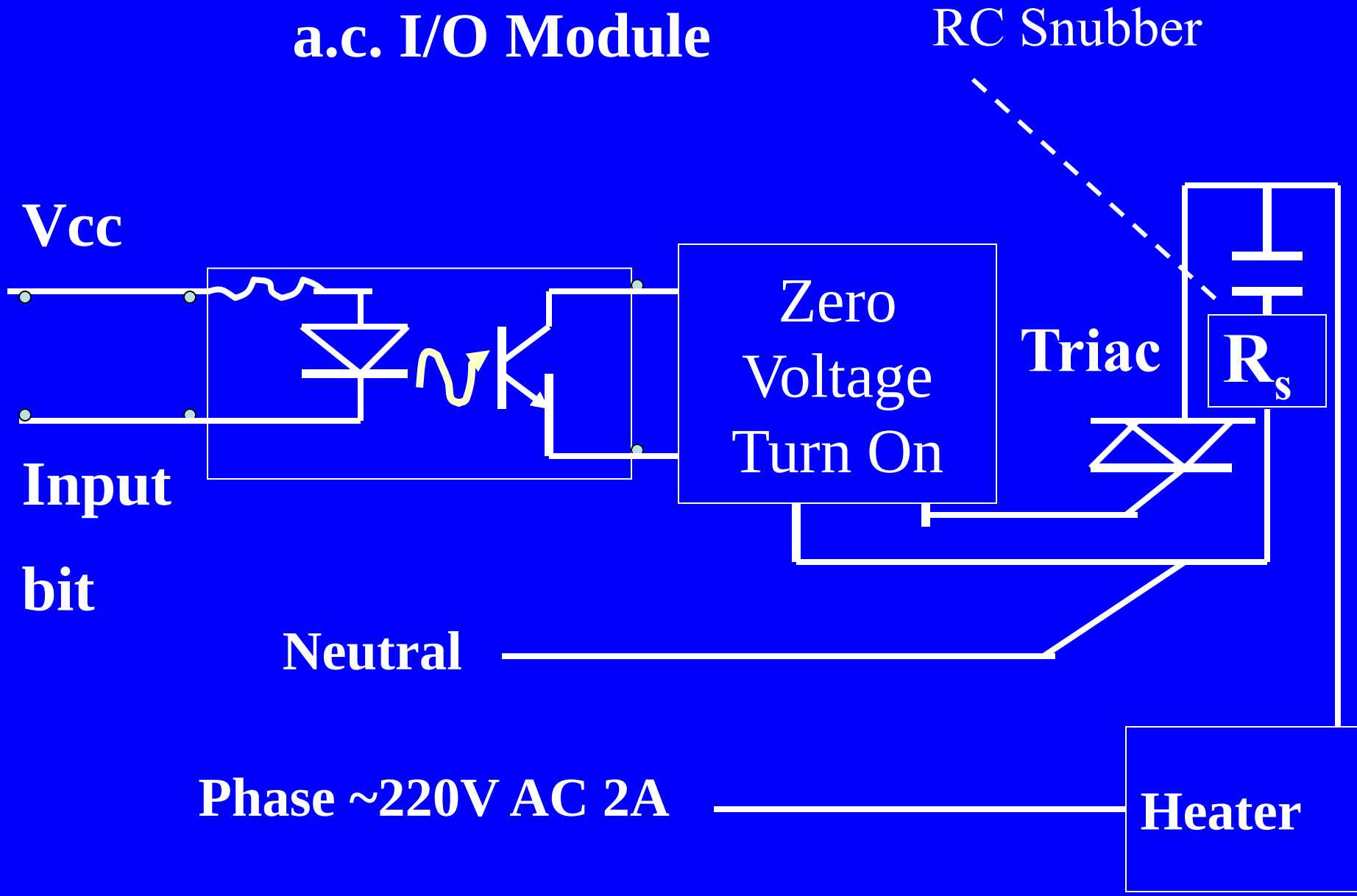

RC Snubber
Vcc
Input bit
Zero Voltage Turn On
Triac
R_s
Neutral
Phase ~220V AC
a.c. load

Exemplary circuits for the motor and heater

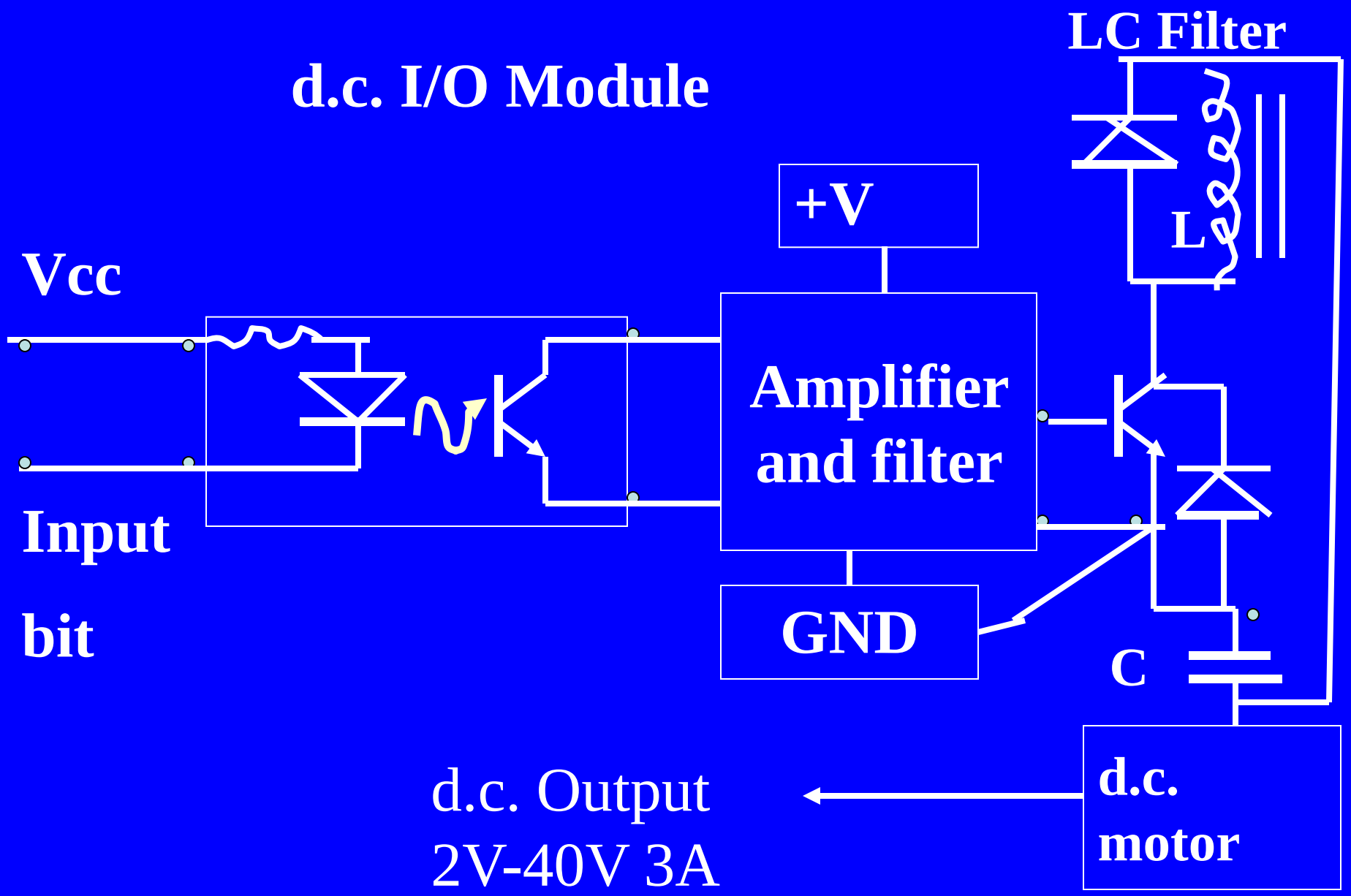
a.c. I/O Module


RC Snubber
Vcc
Input bit
Zero Voltage Turn On
Triac
R_s
Neutral
Phase ~220V AC 2A
Motor

a.c. I/O Module


RC Snubber
Vcc
Input bit
Zero Voltage Turn On
Triac
R_s
Neutral
Phase ~220V AC 2A
Heater

d.c. I/O Module


LC Filter
+V
L
Vcc
Amplifier and filter
Input bit
GND
C
d.c. motor
d.c. Output
2V-40V 3A

Summary

We learnt

IO Modules for High Power Devices

- Built-in Encapsulated LED-PT pair opto-isolator Protects and Isolates
- Built-in Bridge rectifier, signal conditioner, amplifier and triac circuits

We learnt

IO Modules Built-in Circuits

- Internal Reverse biased diode protector, snubber and filters
- Built-in Darlington Transistor Pair for Currents

End of Lesson 10

Interfaces for the High Power Devices