CHAPTER 1: INSTRUMENTATION EQUIPMENT

MODULE 2: ISA Symbols

MODULE OBJECTIVES:

At the end of this module, you will be able to:

1. **Sketch the symbols representing three different Idnds (pneumatic, electronic and mechanical) of transmission line.**

2. **State the instrument which a given standard ISA symbol represents, with respect to its function and mounting location.**

3. **Sketch a simple flows sheet using standard ISA symbols, given the function and location of different instruments and the type of transmission line connecting them.**

Introduction

- **Instruments on drawings which show the location and function of different devices are represented by standard symbols.**
- **In most of North America, a convention based on ISA (Instrument Society of America) symbols has been adopted.**

Line Symbols

- **Transmission lines which link different instruments are shown in Figure 1.**

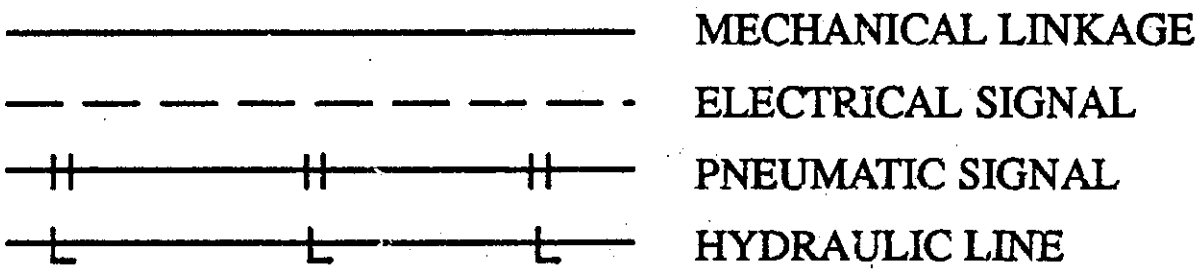


Figure 1 Symbols for Transmission Lines

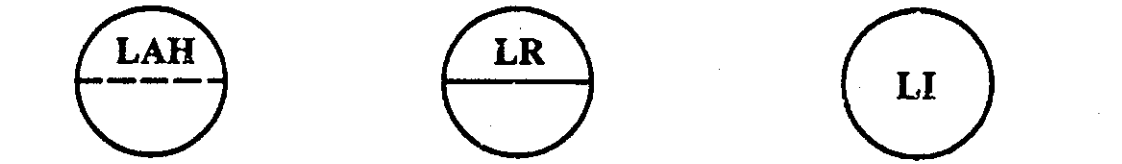
Figure 1: Symbols for Transmission Lines.

Instrument Symbols

- Instruments are identified by circles with lettered codes (two or three letters) inserted. This lettered code shows the instrument type and function.

The first letter in the Code indicates the Process Parameter monitored by the instrument	The second letter in the code indicates the function of the instrument	A third letter in the code is used when the instrument has two functions; it indicates the second function
F = Flow L = Level P = Pressure T = Temperature	FI = Flow Indicator FC = Flow Controller LA = Level Alarm LR = Level Recorder PT = Pressure -Transmitter TE = Temperature Element	FIC = Flow Indicating Controller LAH = Level Alarm High LAL = Level Alarm Low

- To distinguish control room mounted instruments from local or field mounted instruments, a horizontal line across the diameter of the circle is used.



Control Room Rack Mounted High Level Alarm

Control Room Panel Mounted Level Recorder

Field (or locally) Mounted Level Indicator

Figure 2: ISA Symbols and the Instruments they Represent.

Example

A level loop consists of:

Field Mounted: Level transmitter
Level indicator

Control Room Panel Mounted:
Level controller
Level recorder
High level alarm
Low level alarm

The level transmitter is connected directly to the tank and the rest of the instruments are driven by the level transmitter and used to monitor and indicate the level in a tank.

Assuming that the signal transmitted is electronic, draw a representative flow sheet using ISA symbols.

Solution: ISA Symbols Representation of a level Loop

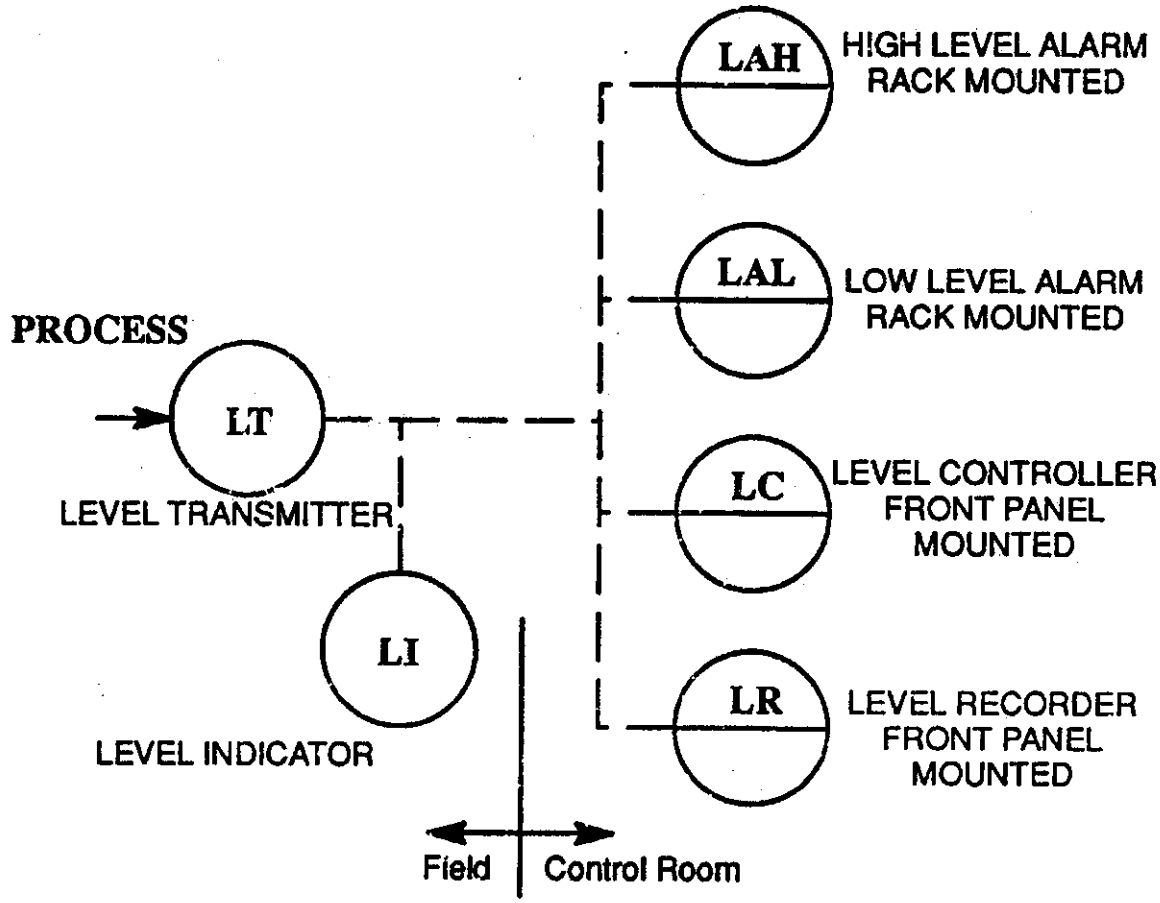


Table 1
Instrument Identification Code

	FIRST LETTER	SUCCEEDING LETTERS		
	Measured Variable	Read-out or Passive Function	Output Function	Modifier
A	CURRENT	ALARM		AVERAGE
C			CONTROL	CONTACT
E		ELEMENT		
F	FLOW RATE			
G		GLASS		
H	HAND (MANUAL)			HIGH
I		INDICATE		
L	LEVEL			
M		MOTORIZED		MEDIAN
P	PRESSURE			
R	NEUTRON FLUX	RECORD	RELAY	
S		SOLENOID	SWITCH	
T	TEMPERATURE		TRANSMIT	
V				VALVE
W		WELL		
X			TRANSDUCER	
Y			COMPUTE	
Z	POSITION			