



Training Course :

**Practical Industrial Data  
Communications &  
Telecommunications**

Training Course For One Week In

**Lebanon , Beirut , Four Seasons  
Hotel Beirut**

Which Be Held As Under Details :



Abar Solutions Petroleum Consultancy Invite Your Employee To Participate With Us In Special Training Course As Under Details :

Course Name		Practical Industrial Data Communications & Telecommunications			
Code	Period	Language	Start	End	Location
ICT 023	5 Days	Bilingual (Arabic & English)	13/08/2017	17/08/2017	Lebanon , Beirut , Four Seasons Hotel Beirut
			03/09/2017	07/09/2017	
			08/10/2017	12/10/2017	
			12/11/2017	16/11/2017	
			10/12/2017	14/12/2017	
			14/01/2018	18/01/2018	
			11/02/2018	15/02/2018	
			11/03/2018	15/03/2018	
			15/04/2018	19/04/2018	
			20/05/2018	24/05/2018	
			10/06/2018	14/06/2018	
22/07/2018	26/07/2018				

**\*\* The Fees Includes : Lecturer , Training Material , Training Room With One Coffee Break Daily , Certificate Of Attendance In Last Day Training Course \*\***

Course Description

⇒ The objective of this workshop is to outline the best practice in designing, installing, commissioning and troubleshooting industrial data communications systems. In any given plant, factory or installation there are a myriad of different industrial communications standards used and the key to successful implementation is the degree to which the entire system integrates and works together. With so many different standards on the market today, the debate is not about what is the best - be it Foundation Fieldbus, Profibus, Devicenet or Industrial Ethernet - but rather about selecting the most appropriate technologies and standards for a given application and

then ensuring that best practice is followed in designing, installing and commissioning the data communications links to ensure they run fault-free.

- ⇒ The industrial data communications systems in your plant underpin your entire operation. It is critical that you apply best practice in designing, installing and fixing any problems that may occur. This workshop distills all the tips and tricks learnt with the benefit of many years of experience and gives the best proven practices to follow. The main steps in using today's communications technologies involve selecting the correct technology and standards for your plant based on your requirements; doing the design of the overall system; installing the cabling and then commissioning the system.
- ⇒ Fiber Optic cabling is generally accepted as the best approach for physical communications but there are obviously areas where you will be forced to use copper wiring and, indeed, wireless communications. This workshop outlines the critical rules followed in installing the data communications physical transport media and then ensuring that the installation will be troublefree for years to come.
- ⇒ The important point to make is that with today's wide range of protocols available, you only need to know how to select, install and maintain them in the most cost-effective manner for your plant or factory - knowledge of the minute details of the protocols is not necessary.

### Course Objectives

- ⇒ Best practice in industrial data communications design, installation and commissioning
- ⇒ Practical hands-on experience in jointing, splicing and testing of copper and fiber based cabling
- ⇒ How to design and install your own fully operational industrial data communications systems
- ⇒ How to integrate different industrial communications protocols and standards into a complete working system

### Course Content & Outlines

#### ⇒ **INTRODUCTION**

- Overview of the course

- OSI model
- Systems engineering approach
- Attributes of typical communications systems
  - Media
  - Physical connections
  - Protocols
  - Applications
- General issues
  - Noise
  - Earthing and grounding
  - Shielding
  - Protection against dust and moisture (IP ratings)

⇒ **FUNDAMENTALS**

- Copper/fiber
  - Cable standards
  - Cable distribution standards
  - Connector standards
  - EMC conformance standards
  - Splicing
  - Connector attachment
  - Drivers and detectors
  - Grounding
  - Termination
  - Protection against transients
- Physical layer standards
  - EIA-232
  - EIA-485
  - 4-20 mA
  - IEC 61158-2 (Intrinsic safety)

- Industrial networks
    - Industrial Ethernet
    - ASi
    - DeviceNet
    - Profibus
    - Foundation Fieldbus
    - Modbus Plus
    - Data Highway Plus
    - HART
    - Ethernet/IP
    - ControlNet
    - ProfiNet
    - Foundation Fieldbus HSE
  - Industrial protocols
    - TCP/IP
    - Modbus
    - Modbus TCP
    - DNP3
    - 60870 SCADA
  - Other technologies
    - VSAT
    - Wireless LAN
    - Wireless point to point
- ⇒ **SELECTION METHODOLOGY**
- Which standards/technologies to use:
    - Field management (device) level
    - Process management (operator) level
    - Business management (enterprise) level
    - Long distance SCADA/telemetry links

⇒ **INSTALLATION METHODOLOGY**

- Copper cabling and connectors
  - System design
  - Installation
  - Tips, tricks and pitfalls
- Fiber cabling and connectors
  - System design
  - Installation
  - Tips, tricks and pitfalls
- Wireless
  - System design
  - Installation
  - Tips, tricks and pitfalls

⇒ **COMMISSIONING/TESTING/ TROUBLESHOOTING**

- Copper infrastructure
- Fiber infrastructure
- Wireless infrastructure
- Networks
  - Physical layer issues (OSI Layer 1)
  - Data link layer issues (OSI Layer 2)
  - Network layer issues (OSI Layer 3)
  - Transport layer issues (OSI Layer 4)
  - Application and "user" layer issues (OSI Layers 7-"8")
  - Client/server issues

⇒ **CONCLUSION**

- Summary
- Open forum
- Closing of workshop