



# SCADA Systems

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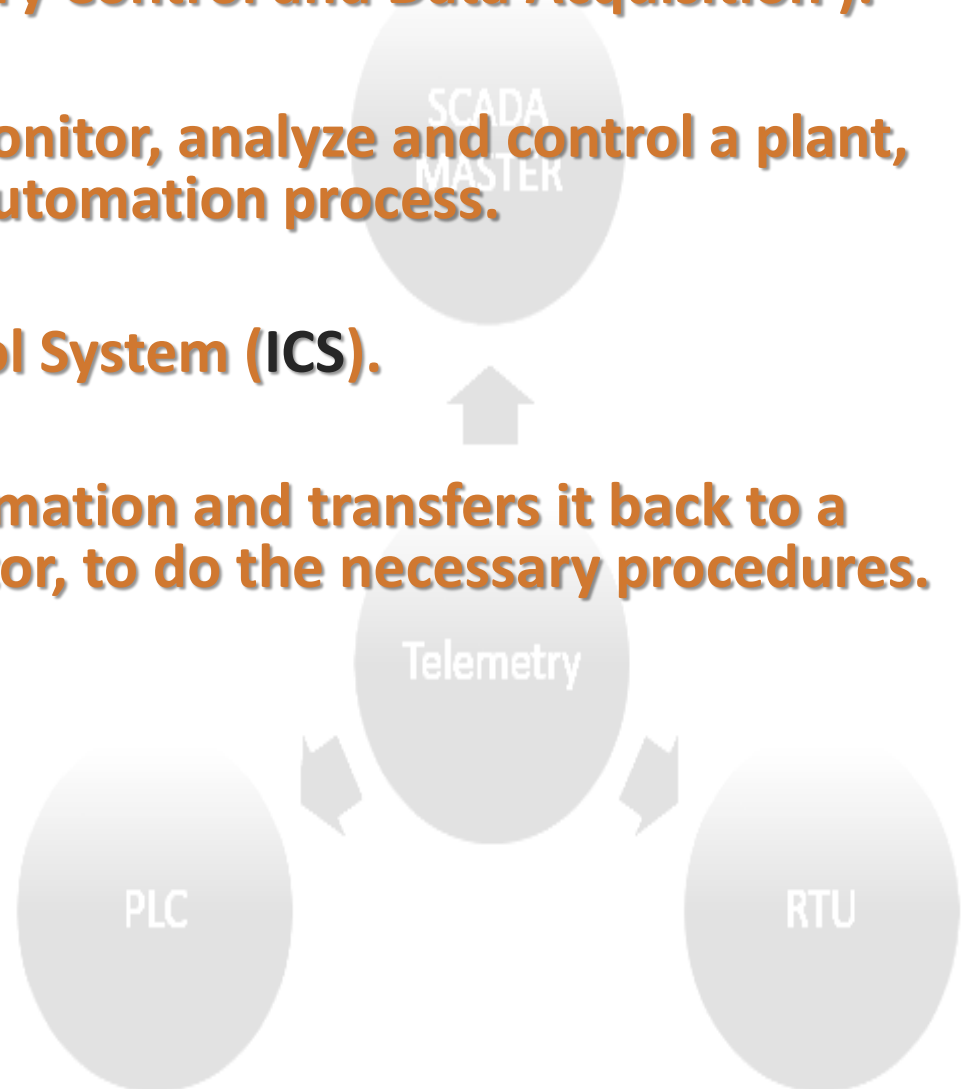
# Abstract

The contents of these slides are about:

- Establishing a basic understanding of the **SCADA** systems.
- How are they utilized in the industrial field.
- The system components.
- **SCADA Vs. DCS.**
- **SCADA architectures.**
- **Fiber optics role.**
- **Pros. And Cons. of SCADA.**

# Overview

- **SCADA is short for ( Supervisory Control and Data Acquisition ).**
- **SCADA systems are used to monitor, analyze and control a plant, equipment or any industrial automation process.**
- **It is a type of Industrial Control System (ICS).**
- **A SCADA system gathers information and transfers it back to a central site to alert the operator, to do the necessary procedures.**



# System Components

SCADA systems consist of the following subsystems:

- Field data interface devices.
- A Telemetry system.
- A Human Machine Interface (HMI).
- A central host computer.
- A Data Acquisition Server.
- A Historian.



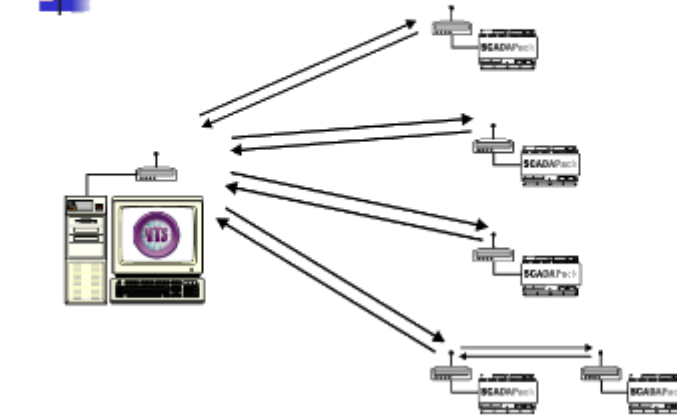
PLC



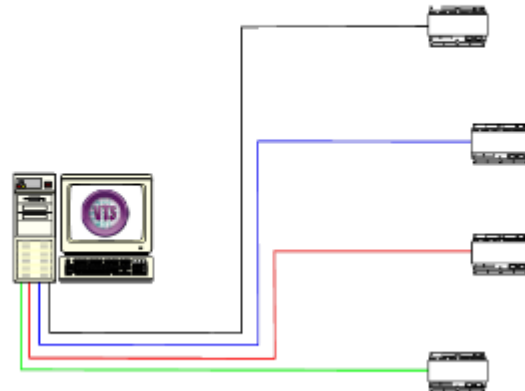
RTU

**Examples of wireless telemetry media used in SCADA systems include satellite (VSAT), radio, telephone, cable, satellite, etc., or any combination of these.**

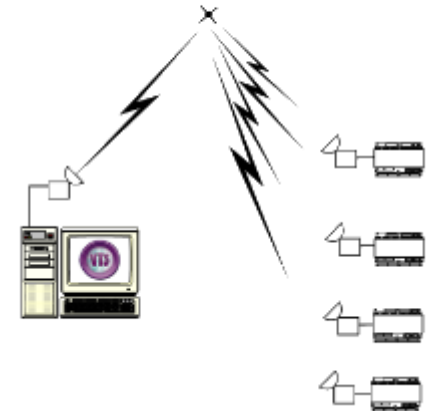
### Communication Architectures



### Link- Land Line

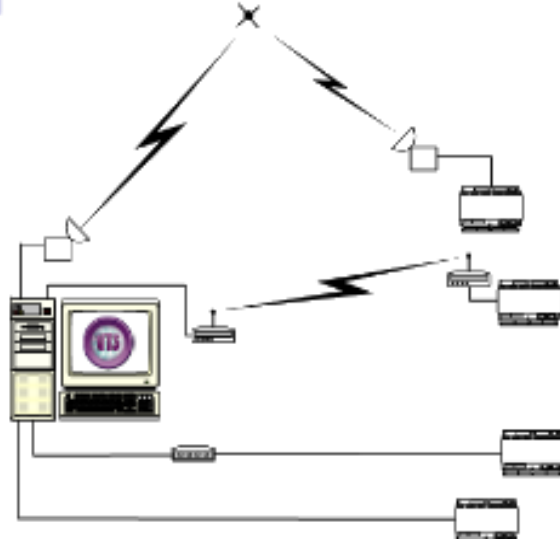


### Link - Satellite

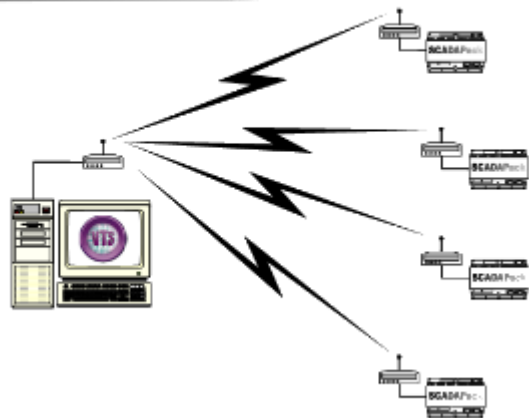




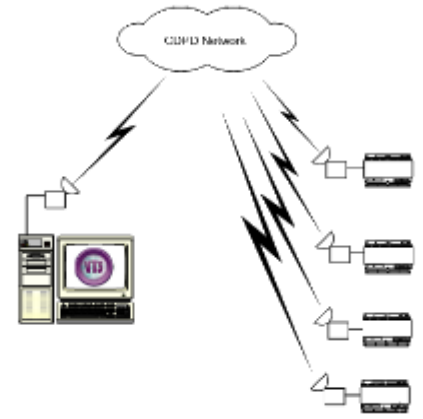
## Link - Combination



## Link - Radio



## Link - Cell Phone





**HMI  
Devices**



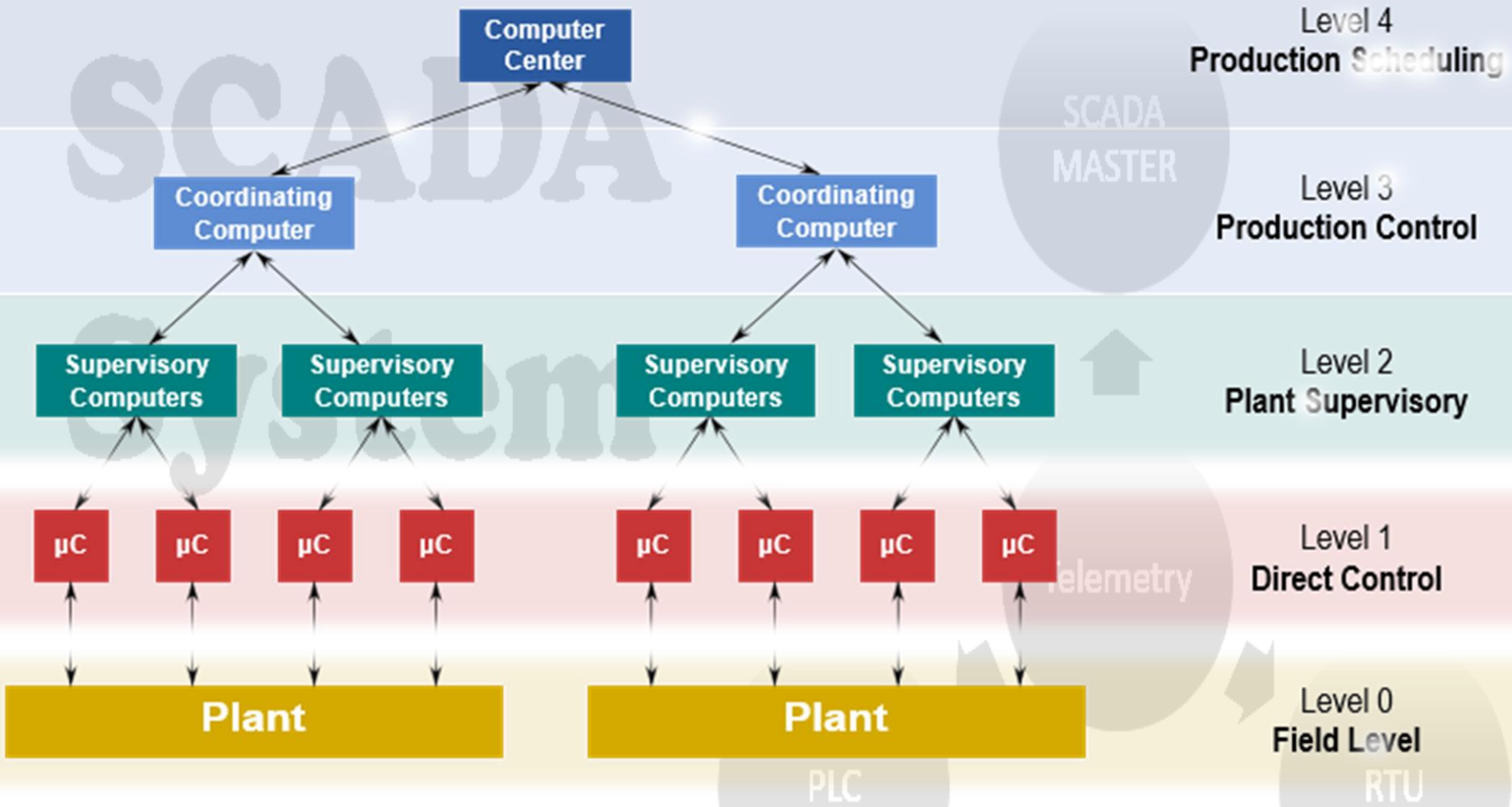
# SCADA systems Vs. DCS

Process Control Systems for industrial processes normally comes in two flavors: SCADA/PLC systems and Distributed Control System (DCS):

SCADA/PLC	DCS
A SCADA/PLC system consists of a PLC for control and the SCADA being the human interface for it.	A DCS has the plant control and human interfacing combined in one system.
A SCADA/PLC system is cheaper than a DCS and better than a DCS.	For some applications, a DCS is better.

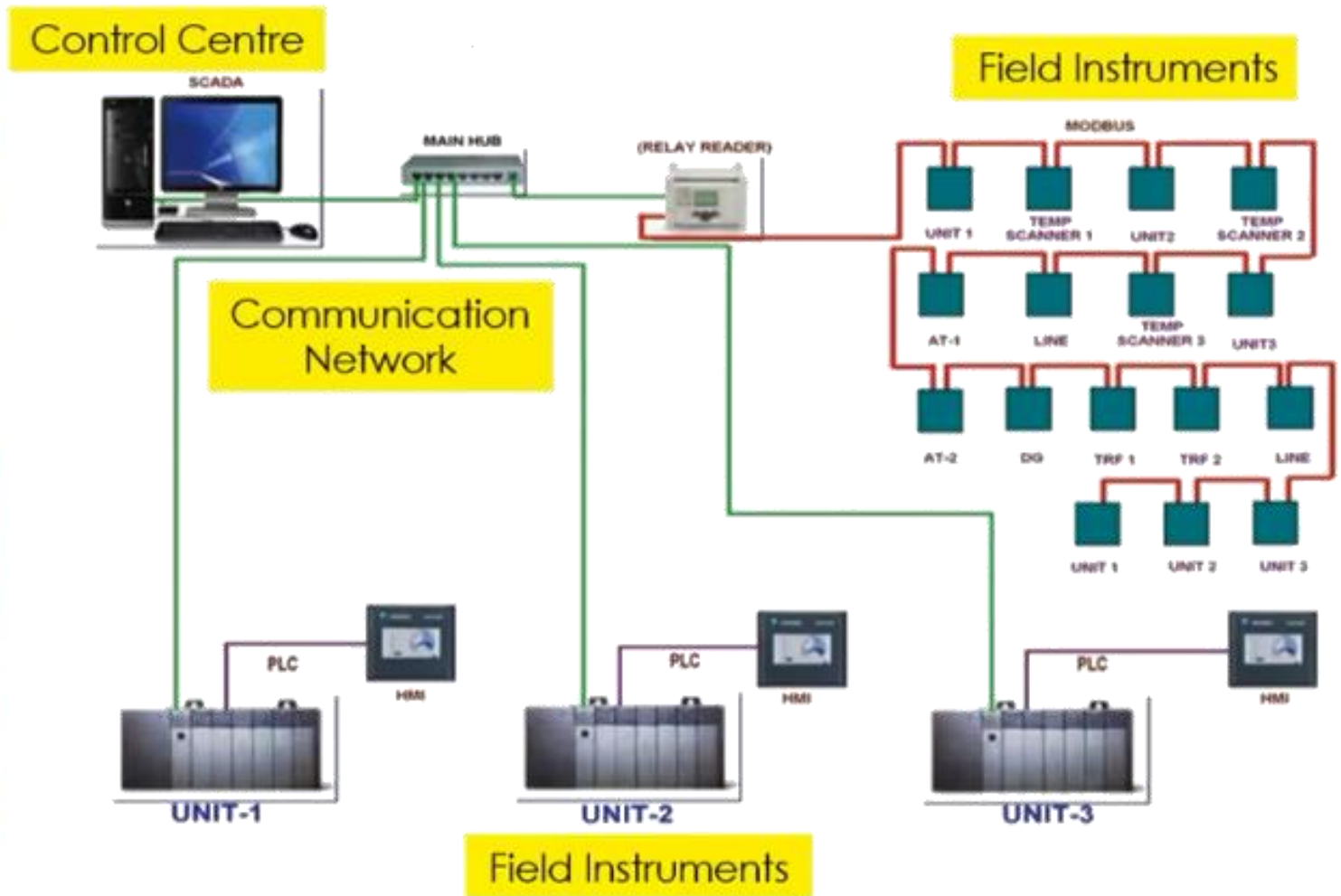


# SCADA systems Vs. DCS



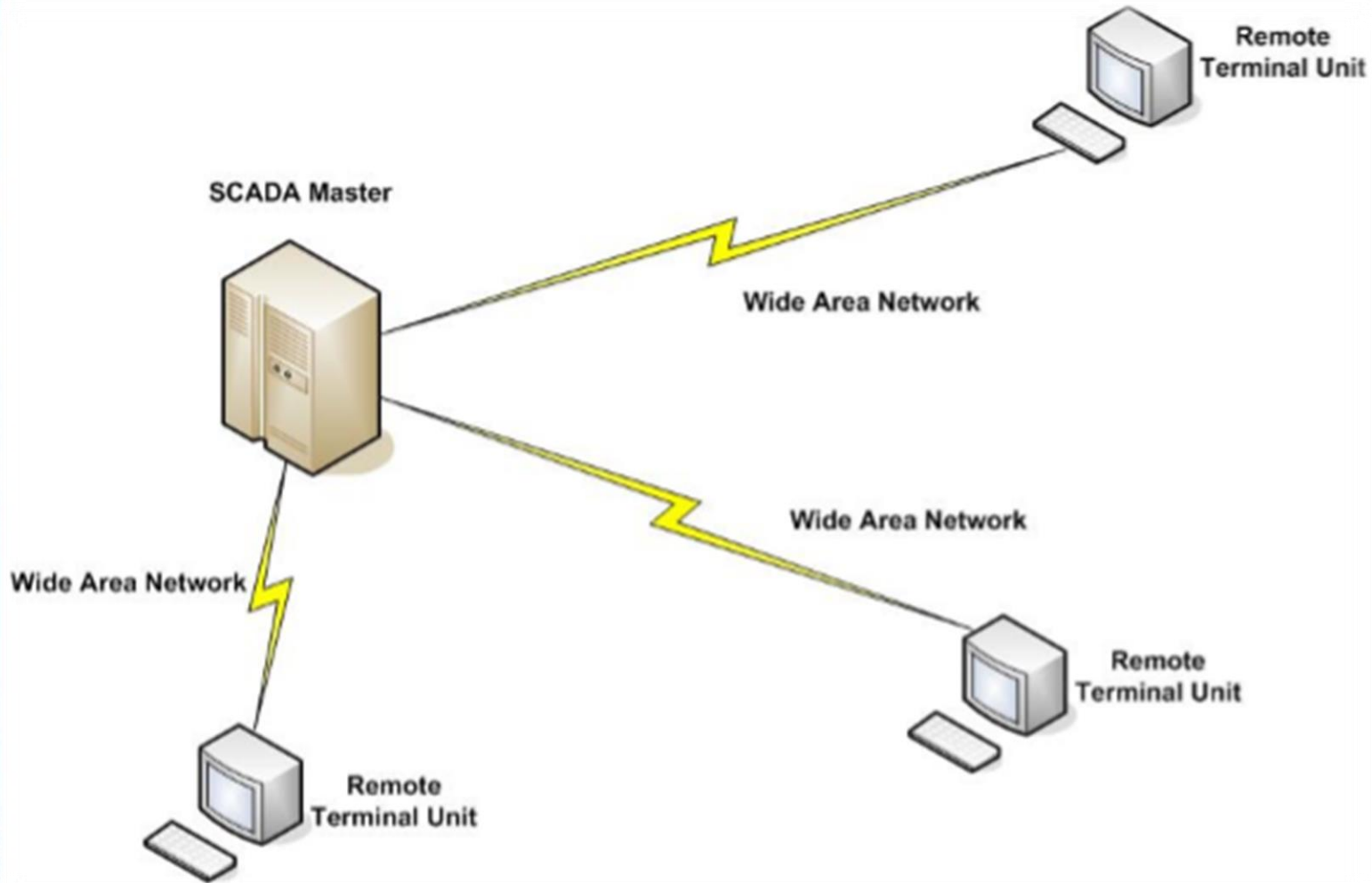
DCS Architecture

# SCADA systems Vs. DCS



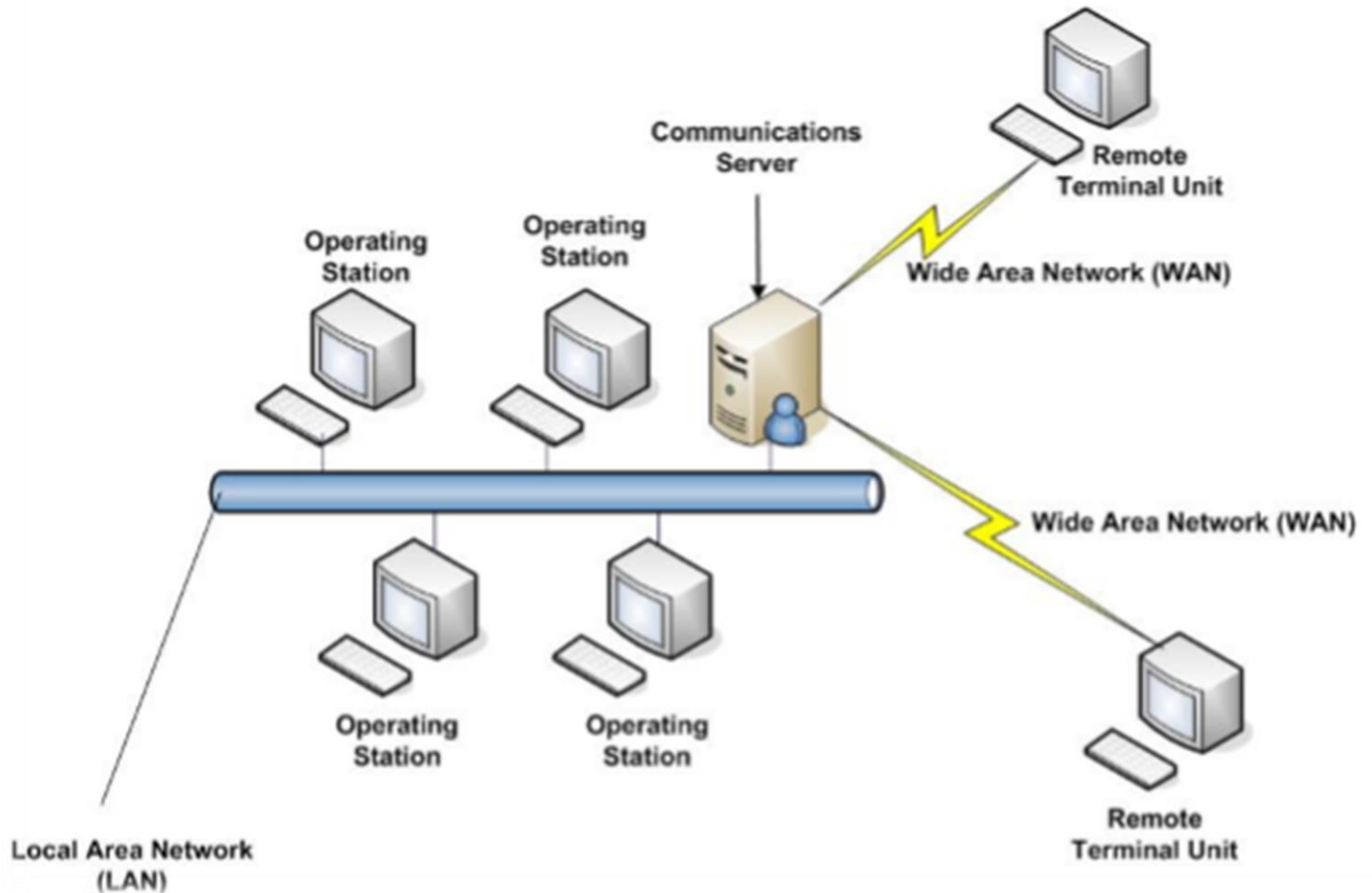
## SCADA Architecture

# SCADA Architecture



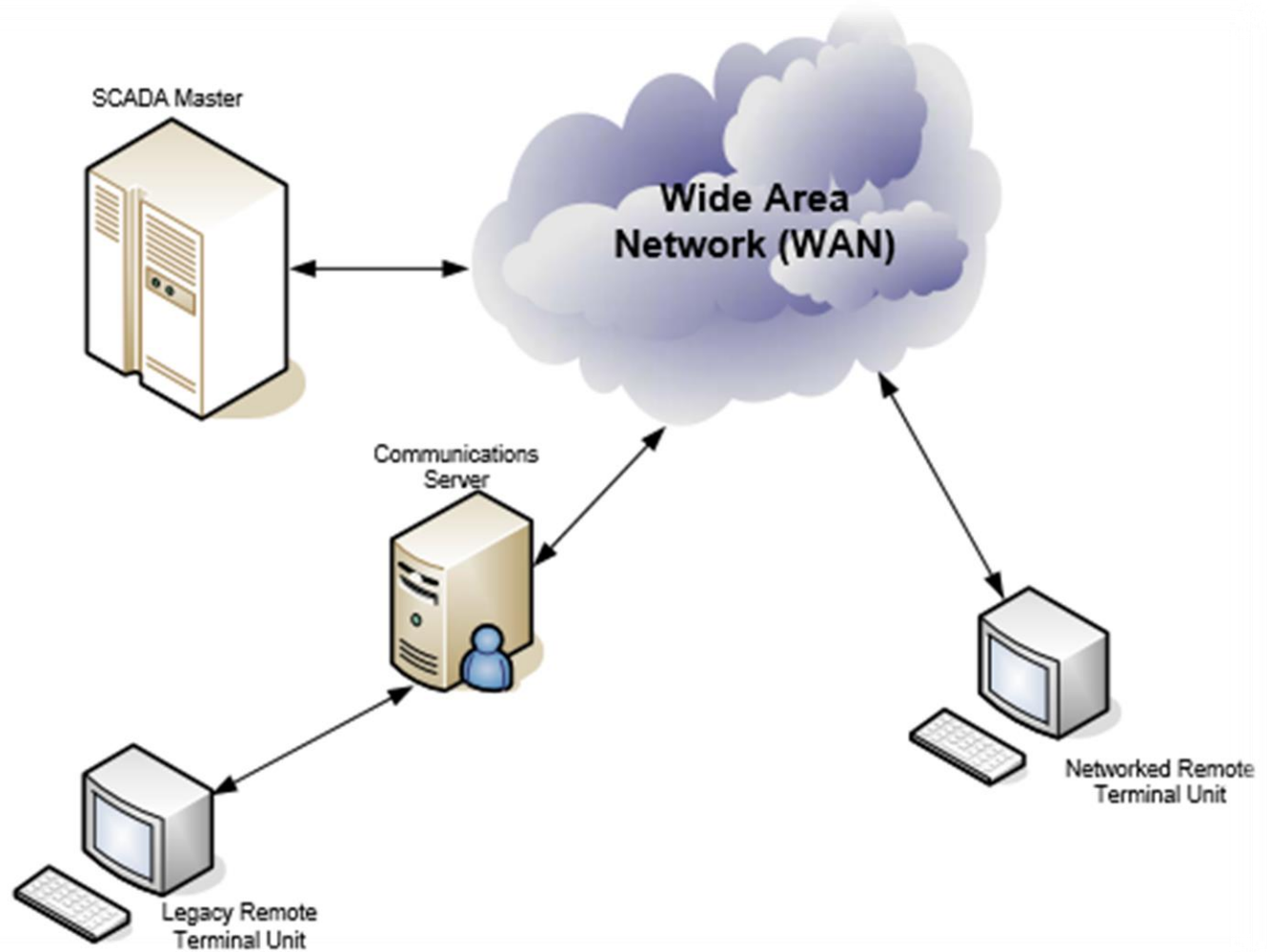
**First generation (Monolithic)**

# SCADA Architecture



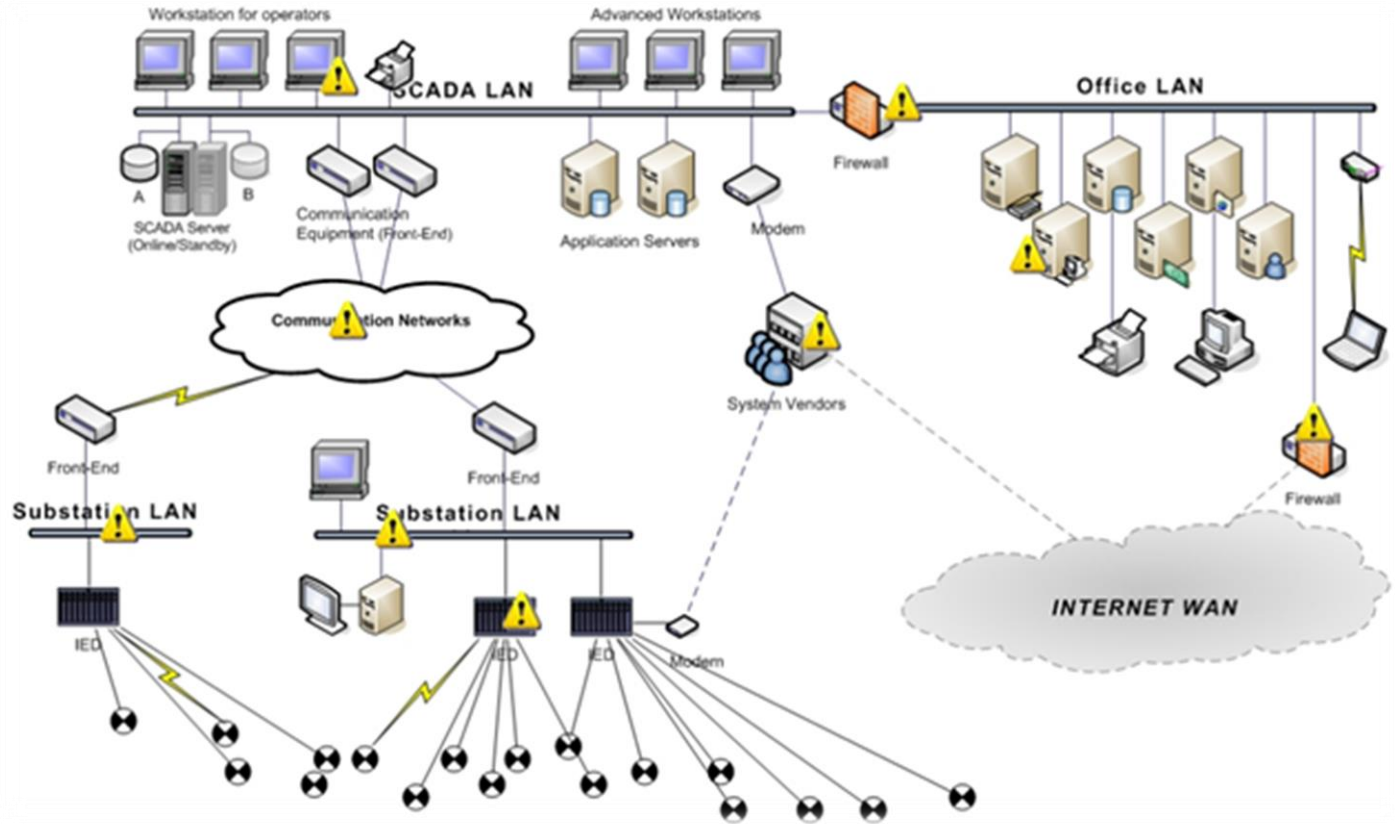
**Second generation (Distributed)**

# SCADA Architecture



**Third generation (Networked)**

# SCADA Architecture



**Fourth Generation: IoT**

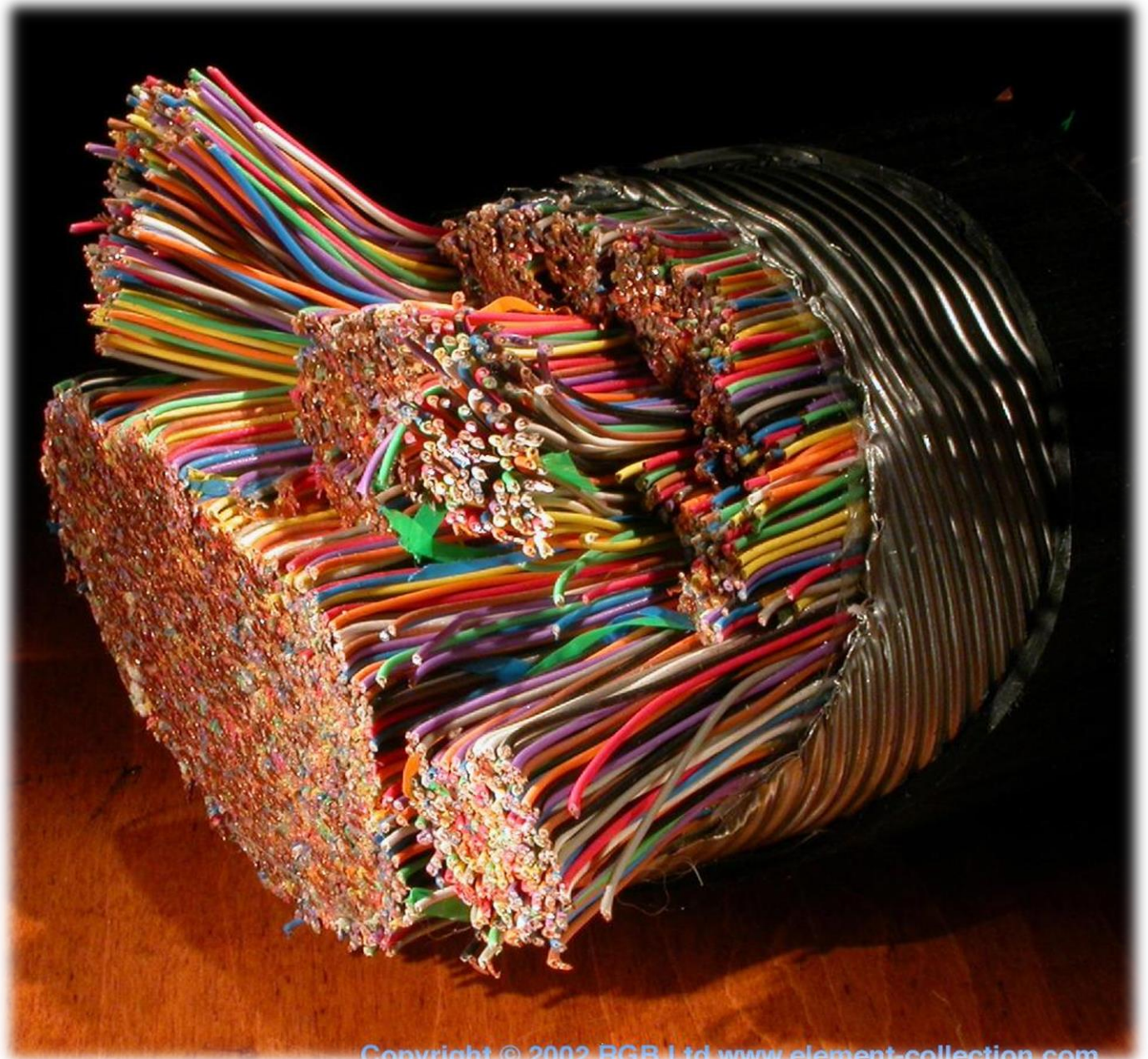
# Fiber Optics

## How Can Fiber Optics Improve SCADA ?

### Fiber Optic Technology provides:

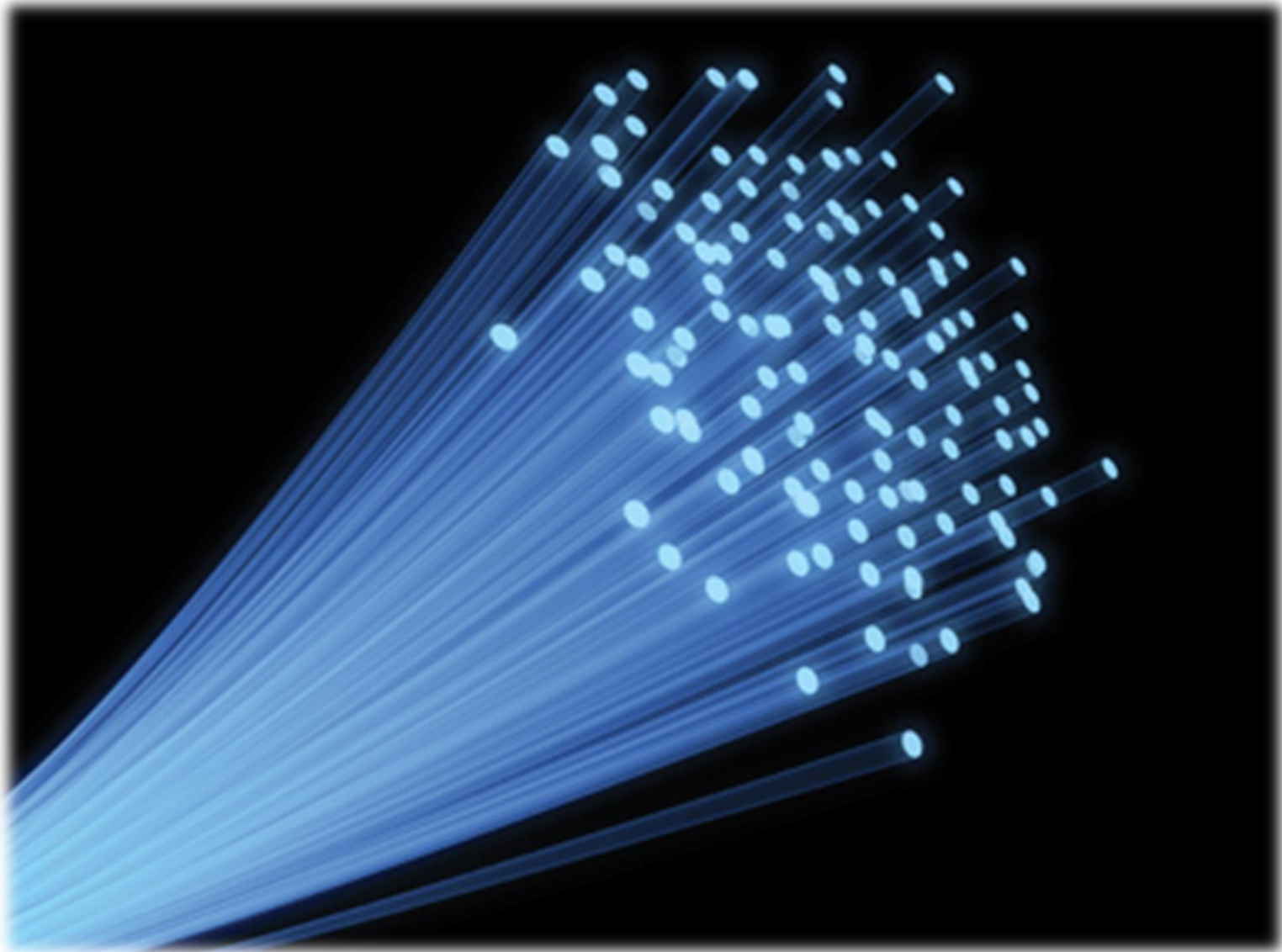
- **Immunity to EMI/RFI (Electromagnetic interference or Radio frequency interference).**
- **Elimination of Spark Hazards.**
- **Increased Transmission Distances.**
- **Immunity to Ground Faults and Transients.**
- **Greater Bandwidth (increased signal capacity).**
- **Secure Transmission.**

# Fiber Optics

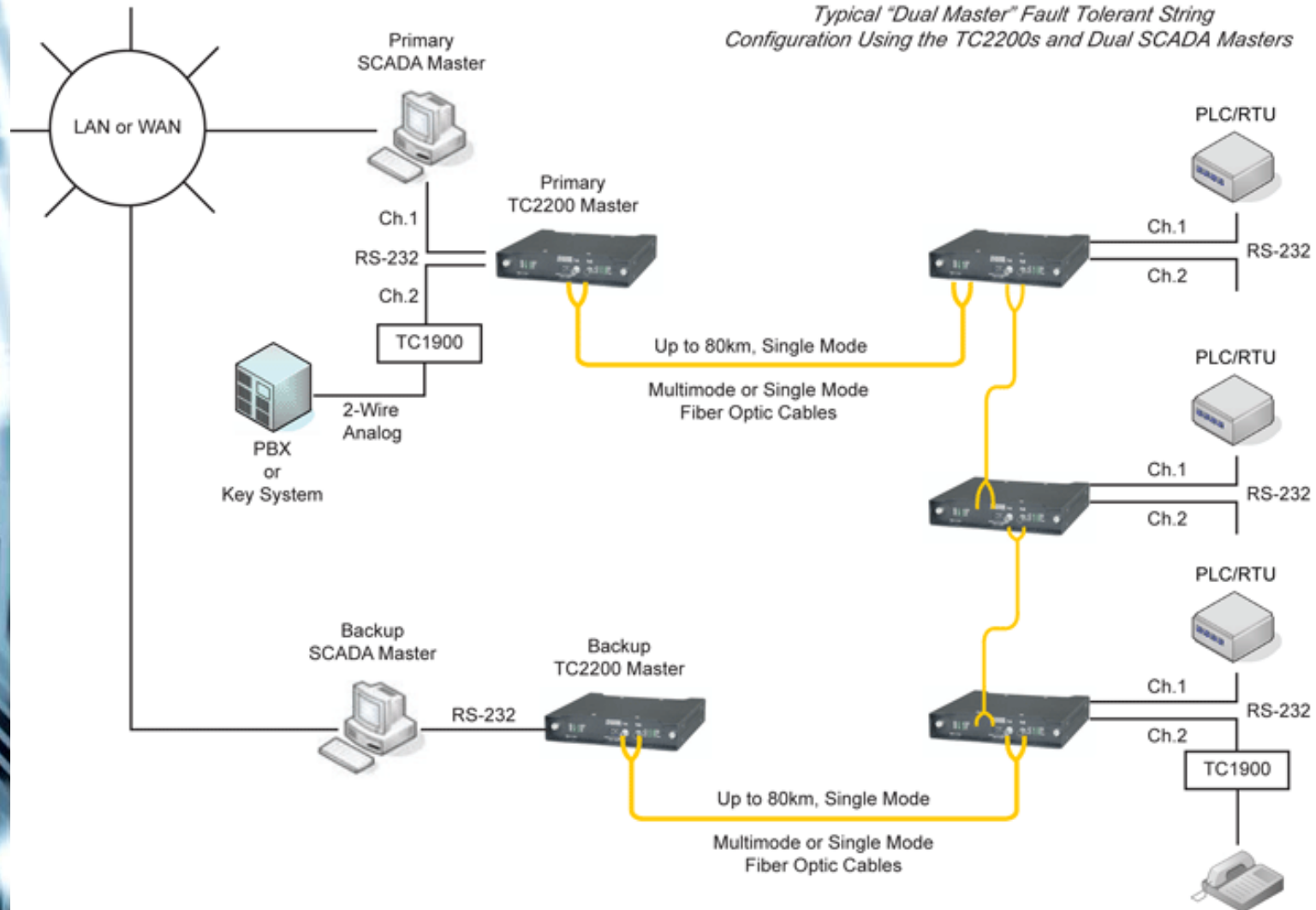




# Fiber Optics



# Fiber Optics



# Pros and Cons

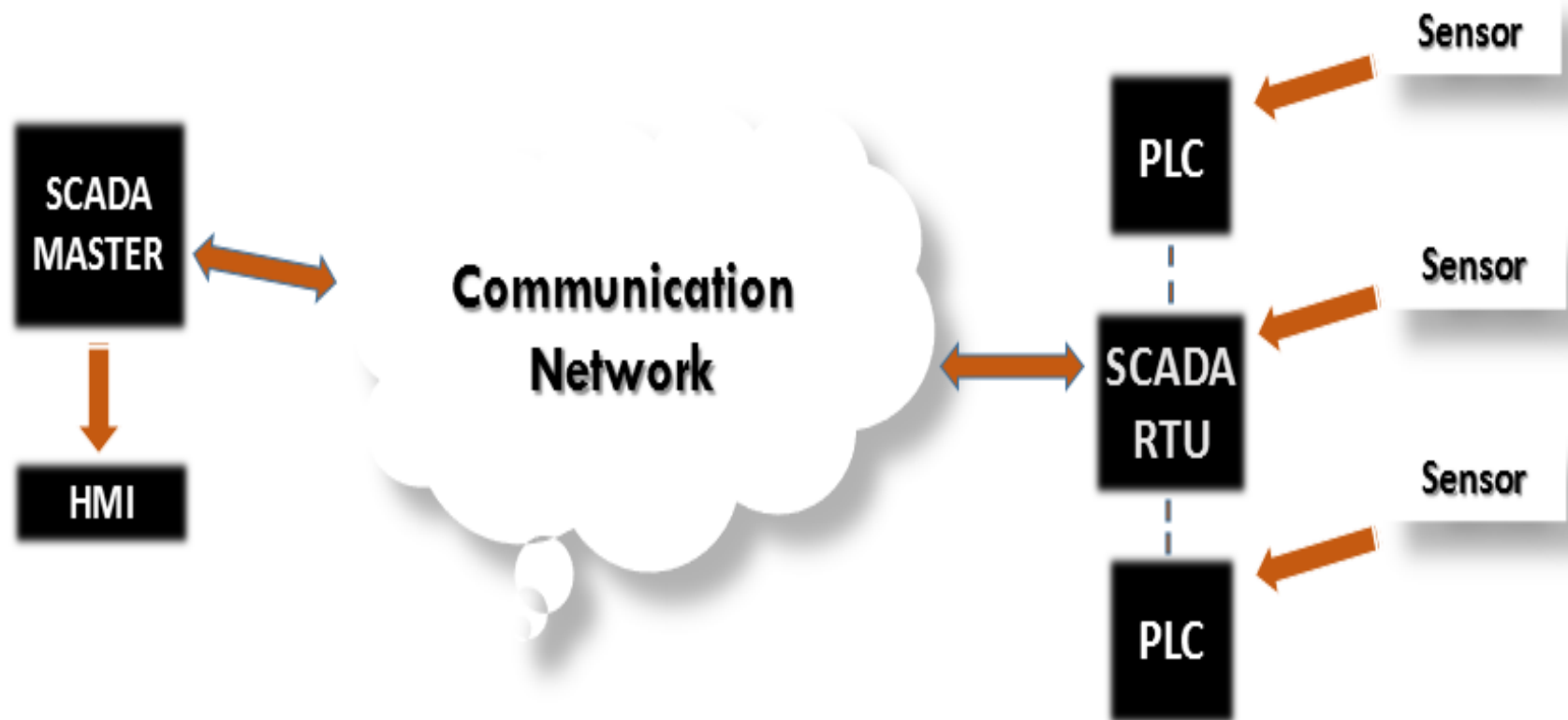
## ➤ Pros of SCADA systems:

- Maintenance
- Productive employees.
- Remote access.
- Efficiency
- Cost.

## ➤ Cons of SCADA systems:

- Hacking

# SCADA



**Sorry for taking so much of  
your time  
Thank you all ...**