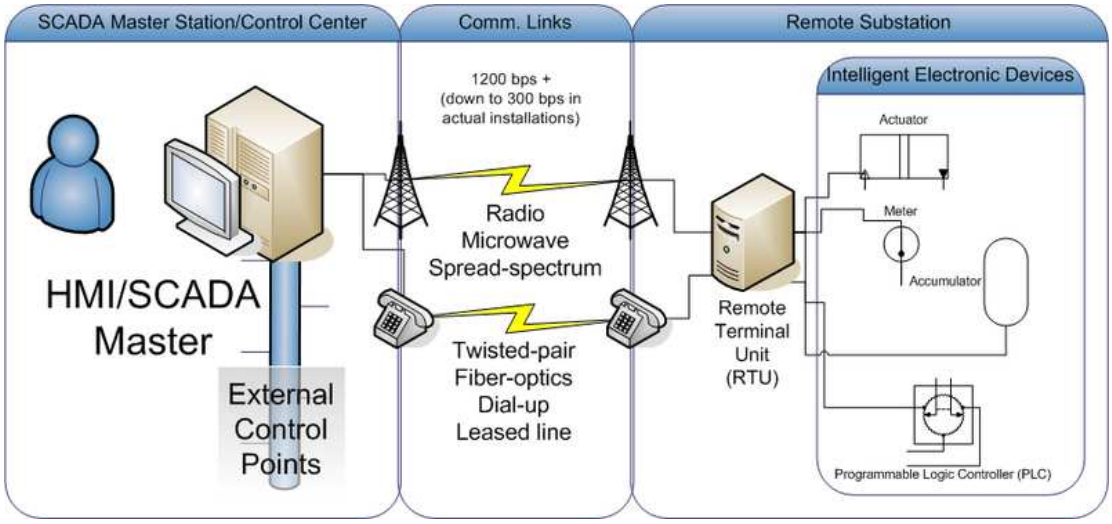
Using the DNP3 Protocol with iDS Device Servers

DNP3 (Distributed Network Protocol) is a set of communications protocols used between components in process automation systems. Its main use is in utilities such as electric and water companies. Usage in other industries is not common. It was developed for communications between various types of data acquisition and control equipment. It plays a crucial role in SCADA systems, where it is used by SCADA Master Stations (aka Control Centers), Remote Terminal Units (RTUs), and Intelligent Electronic Devices (IEDs).

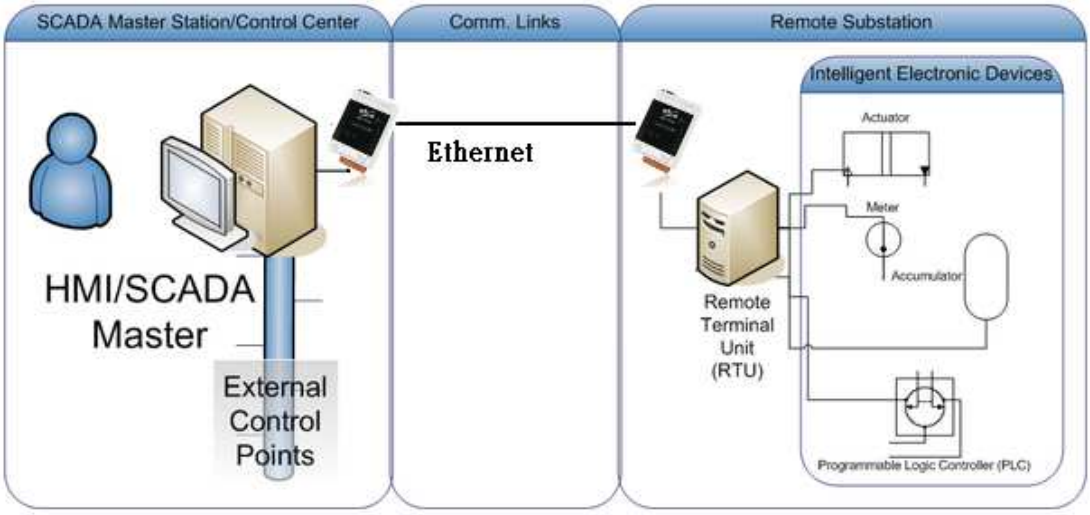


The iDS series is a new generation Device Server from ICP DAS and is equipped with a powerful CPU module, various connectivity and communication interfaces. Compared with the previous generation Device Server, not only the CPU performance is higher but also more features are improved such as 256 MB flash, 256 MB DDR3 memory, unique 64-bit hardware serial number, and real-time clock, etc. These make the iDS series becoming one of the most powerful systems.

This device server is designed to add Ethernet and Internet connectivity to any RS-232 and RS-422/485 device, and to eliminate the cable length limitation of legacy serial communication. The iDS, coupled with a large built-in RAM buffer, allow for fast transmission and prevent congestion of serial data on the network. Built-in powerful 720 MHz ARM-based processor offers excellent performance at low power consumption.

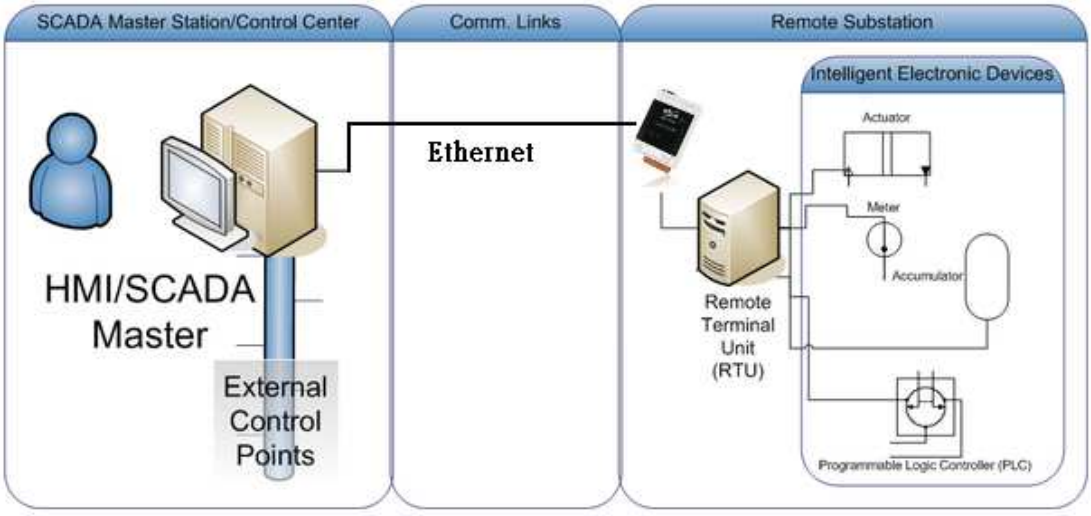
DNP3 over Ethernet Communication link

The iDS-700 device servers can be used to create a pair-connection application (as well as serial-bridge or serial-tunnel), and can then route data over TCP/IP between two serial DNP3 devices, which is useful when connecting mainframe computers, servers or other serial devices that do not themselves have Ethernet capability. It eliminates the cable length limitation of legacy serial communication devices.



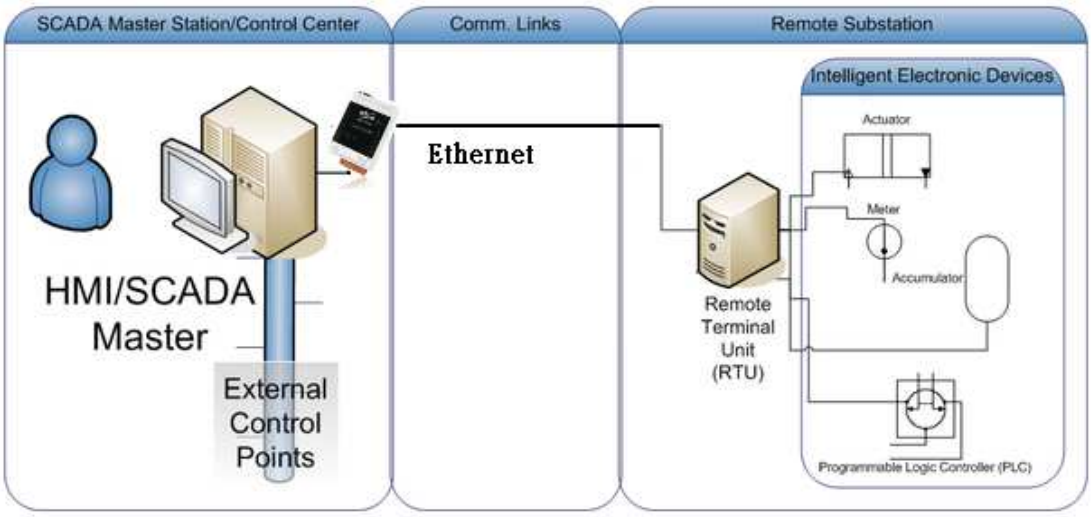
DNP3 Master over TCP/IP or UDP/IP

TCP Server (or UDP) mode of iDS-700 enables a DNP3 over TCP/IP (or UDP/IP) host to communicate with serial DNP3 devices through an Ethernet network, which is useful when connecting serial DNP3 devices that do not themselves have Ethernet capability. By virtue of its protocol independence and flexibility, the iDS-700 meets the demands of virtually any network-enabled application.



DNP3 Slave over TCP/IP or UDP/IP

The iDS-700 acts as a client of DNP3 over TCP/IP (or UDP/IP) or DNP3 master to DNP3 over TCP/IP (or UDP/IP) slave gateway, which is useful when connecting mainframe computers or servers that do not themselves have Ethernet capability.



Application - DNP3 Master over TCP/IP

The iDS can be set to TCP Server mode with TCP port 20000 for DNP3 Master over TCP/IP application. In TCP server mode, the iDS listen on the specified TCP port, waiting and accepting connections from TCP Client. The TCP client initiates communication to the iDS, establishes the connection, and sends/receives data from the serial port side.

