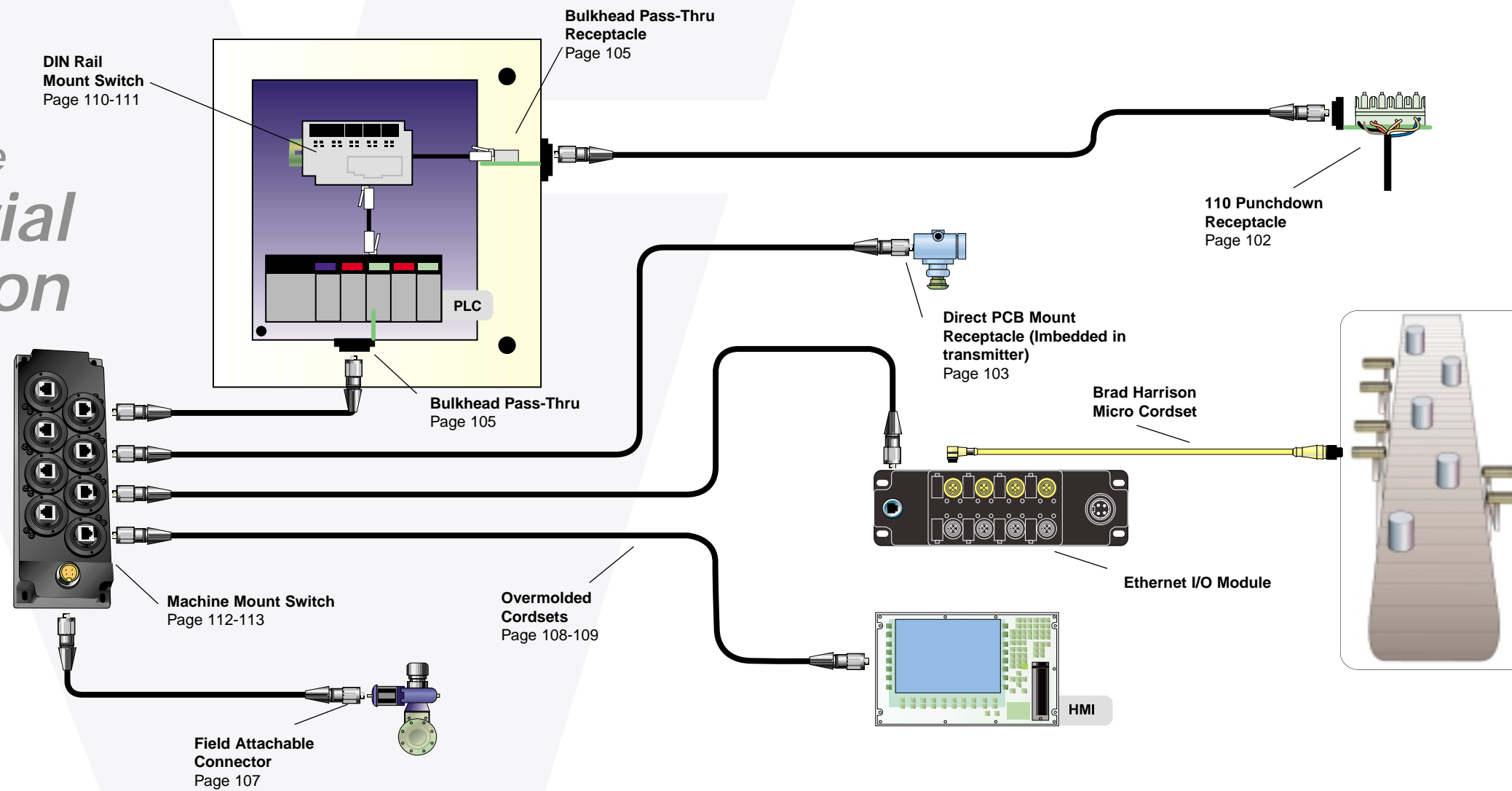


# A Dynamic Force in Industrial Automation and Controls



## WOODHEAD CONNECTIVITY AND ETHERNET

Woodhead Connectivity, through its RJ-Lnxx® brand, provides a truly unique solution that enables the world's most popular Local Area Network to be reliably utilized on the factory floor or in harsh commercial environments. Based on the idea of marrying an RJ-45 connector, which is a proven concept for high-speed data transmission, with an overmolded mini connector, the RJ-Lnxx line offers a variety of physical media, including receptacles, bulkhead pass-thrus and cordsets which provide the robustness need to survive outside of a benign office environment. RJ-Lnxx active Ethernet switches play a key role in transmitting time critical control related data in a reliable manner, and unlike their commercial grade counterparts are designed to live either in an industrial enclosure or directly on the side of a machine. With RJ-Lnxx products in place, true connectivity between the manufacturing operation and the enterprise system is now a reality.

## COMPONENTS AND ELEMENTS OF ETHERNET SYSTEM



### Control Engine

PC "soft controllers" or PLCs can act as the main control engines, taking the current I/O status off the network and solving these operations through the main control program. The new status of the I/O is then updated via the network interface to the actuators, starters and interface panels. Many times a central control engine acts as the DeviceNet "master" which initiates and controls many of the messaging sequences of the network.



### Network Interface

The scanner resides in a controller whether it is a PLC or PC, and provides a network connection. The scanner exchanges a data table, which is loaded with the various values of the inputs and outputs, with the logic controller to solve the various logical expressions. Simultaneously the operation of the master and/or slave protocols is completed. The logical expressions are then re-exchanged with the data table for communication out to the various nodes and I/O residing on the network. The scanner generally supports all standard baud rates of the network.



### Active I/O Devices

These are devices which incorporate their own Ethernet transceiver and physical network connections. Detailed information can be received back from the I/O devices with a sensor being able to report back such information as distance measurements, power status, last-time to maintenance, etc.



### Active I/O Modules

Active blocks serve as a gateway to enable non network input and output devices to send and receive data over the network. The actual I/O send a standard electrical signal via a Brad Harrison quick disconnect cordset, which is then converted to the appropriate Ethernet protocol for network transmission.



### Gateways

Seamlessly transfer data in real time between dissimilar network protocols.



### Media

Ethernet systems are predominately designed in a star topology using twisted pair copper cable and/or fiber optic cable. Twisted pair cables either field terminate, usually to a 110 punchdown block, or utilize an RJ-45 connector. A variety of connectors exist for fiber optic cabling including SC, ST and MT-RJ versions.



### Twisted Pair Cable/Cordsets

Copper based cable, using 2 or 4 twisted pairs. Several different types of cable are available including Shielded (STP) or Unshielded (UTP), as well Solid Core or Stranded. The cable can either be field terminated to a receptacle via a 110 punchdown block, or can come with RJ-45 connectors (often referred to as a patch cable)



### Fiber Optic Cable

Transmits data by means of light pulses emitted from a laser or LED. This method provides for longer transmission distances (2 KM) and the ability to support higher transmission speeds. Because of this capability, fiber is popular for use as a backbone cable connecting various network segments. Cordsets are available with several types of connectors including ST, SC and MT-RJ.



### Switching Hub

Ethernet uses a star topology, requiring a message to be sent through a central device. A switching hub is a islayer 2II device which connects to an Ethernet station, stores the transmitted message, then forwards it out the appropriate port.



### Cordsets

Input and output connections from the blocks to devices like sensors or valves are made with industry standard 12mm Micro-Change® DC style connections.



### Server/Firewall

As the network requirements of a factory, particularly one used to transmit time critical control data, are different than those of the front office, it is often desirable to have all factory communications be linked to their own server. This form of network design not only assists in minimizing front office transmissions from using up factory floor bandwidth, but provides a security function which regulates access to sensitive data and functions.