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CC-Link NORTH AMERICA
IN ACTION

CC-Link Improves Printing Press Control

CC-Link provides the "open" network backbone for the control of 32 Tensor printing press units at Engle Printing in Lancaster, PA. It is also the network controlling 2 four-color presses at Press Enterprise in Bloomsburg, PA. These systems were designed and installed by Computer Integrated Automation, Inc. of Carol Stream, Illinois. Computer Integrated Automation (CIA) is an authorized Mitsubishi Electric system integrator. *CC-Link* is used for remote interface, integrating third party equipment devices, data collection, information handling, and the exchange of control signals between PLC's and the presses. CIA has used *CC-Link* in 8 other printing installations in addition to those described here.

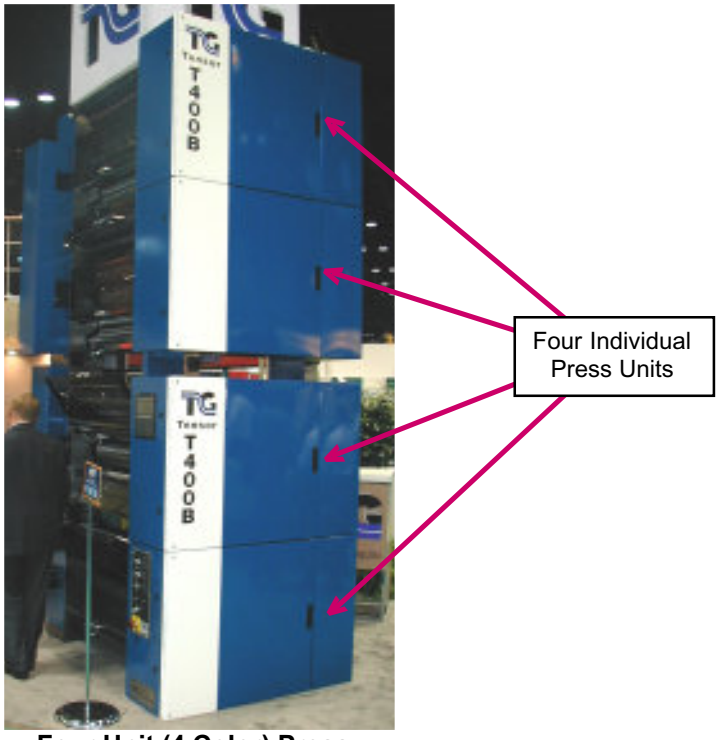
Benefits Provided by *CC-Link*

Substantial cost savings are realized through the use of *CC-Link* networking. The amount of wiring in a 24 unit non-networked press is typically 150,000 feet. This included hundreds of digital and analog I/O that would need to be individually wired back to a central controller. The use of *CC-Link* has drastically reduced the amount of wiring to approximately 10,000 feet for a dramatic savings of approximately 140,000 feet of wire. Not only is the cost of the wire itself reduced but the labor to install, route and terminate this 140,000 feet of wire is saved.

As with other *CC-Link* installations, this network approach eliminates the wiring mistakes so common with non-networked systems. Thus, field installation requires far less time and system start-up is considerably more efficient with less downtime for the end-user.

The speed of the *CC-Link* network (10Mbps) and the fast update time allows quick response in the control of the ink and water motors thus reducing the paper waste that would occur during start-up and after plate changes. Also, the fast speed of *CC-Link* enables quick system response in the event of a web break or when a paper jam is detected. The effectiveness of *CC-Link* accuracy, speed and durability provides conditions that reduce paper waste, offers safer operating conditions and reduces damage to the press units and folders due to paper wrap-ups.

The open-technology aspect of *CC-Link* allows a wide variety of automation equipment from numerous manufacturers to be integrated for fast and effective control. PLC's, Motion controllers, Pneumatic valve manifolds, Variable Frequency Drives (VFDs), Digital I/O, and Analog I/O are all connected via *CC-Link* for reliable control of the printing process.



Four Unit (4 Color) Press
(Photo A)

Description of the *CC-Link* Based Printing Press

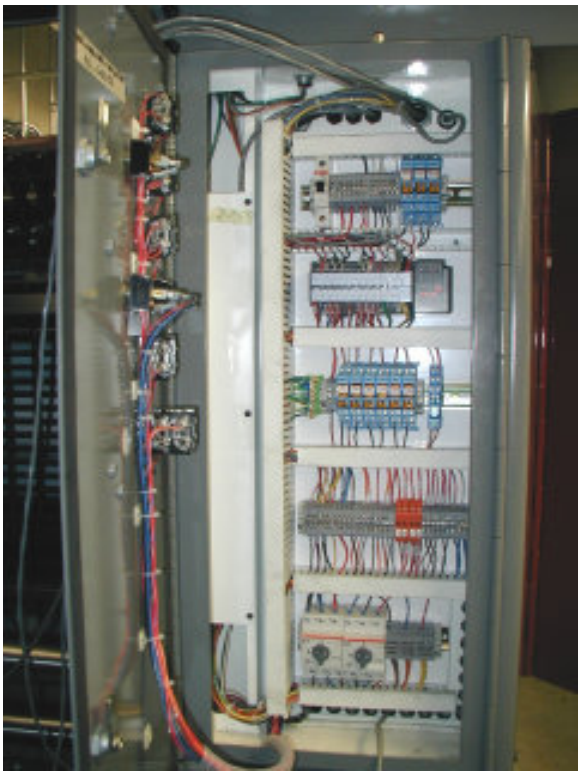
The press units are designed with a separate *CC-Link* network for each press unit for a modular, expandable design concept. Each press unit produces a single color. Four individual press units may be connected together to operate as a four-color press. The separate network feature allows the separate startup of each unit, and thus a separate startup of each color. An additional advantage of the separate network design is that it allows for easy expansion of the press in the field. A four-color press is shown in Photo A. This press consists of four individual press units, stacked one on top of another.

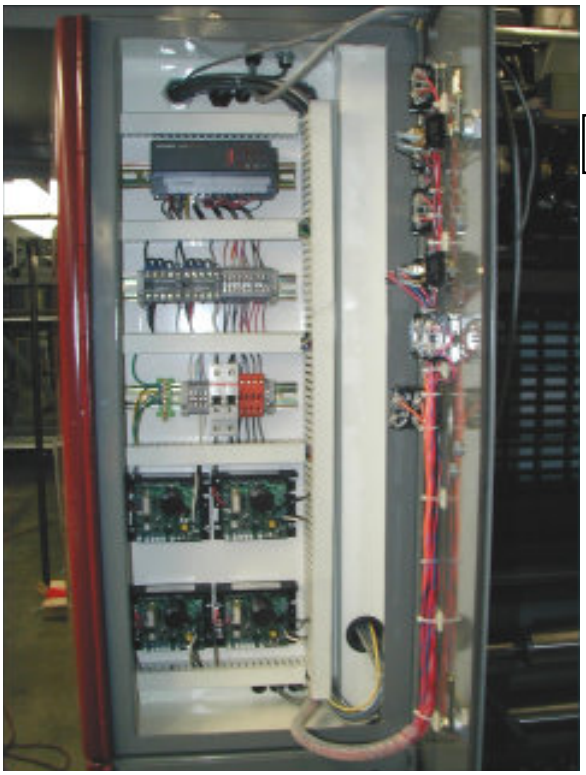
Inside each press unit are two control panels. The control panels are located on opposite sides of each press unit, with Control Panel #1 located on the left side of the press and Control Panel #2 located on the right side of the press.

The contents of the panels are shown in Photo B. Control Panel #1 contains a *CC-Link* 16 In & 16 Out Discrete I/O unit in addition to the other control equipment. Control Panel #2 contains a CC-*Link* Analog output unit within the control equipment cabinet.

The four-color press shown in Photo A is on the floor of a trade show. A series of these stacked 4 unit presses are in operation as part of a 32 press unit system at Engle Printing in Lancaster PA (Photo C). The original installation consisted of 24 units (4 four-color presses and 8 single color presses). Engle Printing was very satisfied with the presses and the performance of the *CC-Link* network and decided to expand their printing capacity by adding 8 more press units. The new presses were installed and commissioning was accomplished through the use of a modem connection. CIA was able to perform the start-up from an off-site location without the need to travel to the Engle Printing. This accomplishment demonstrates the ease of expanding *CC-Link* based systems.

Panel #1



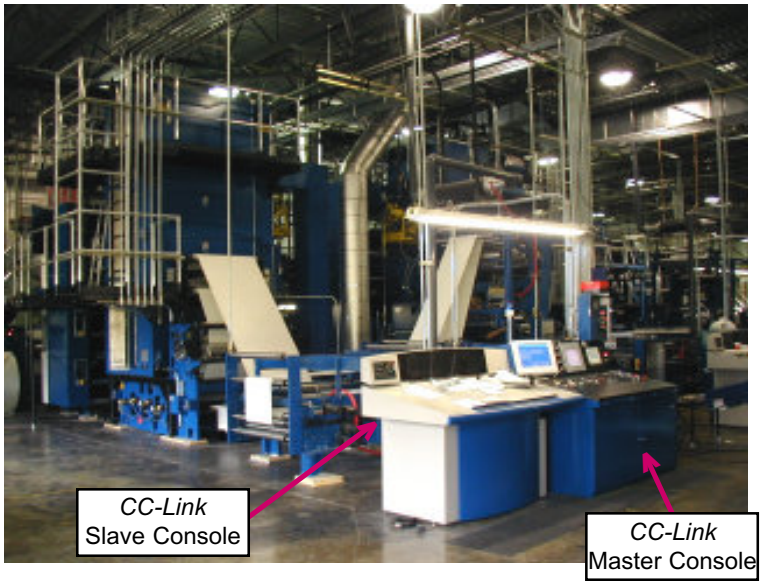


Panel #2

Control Panels
(Photo B)

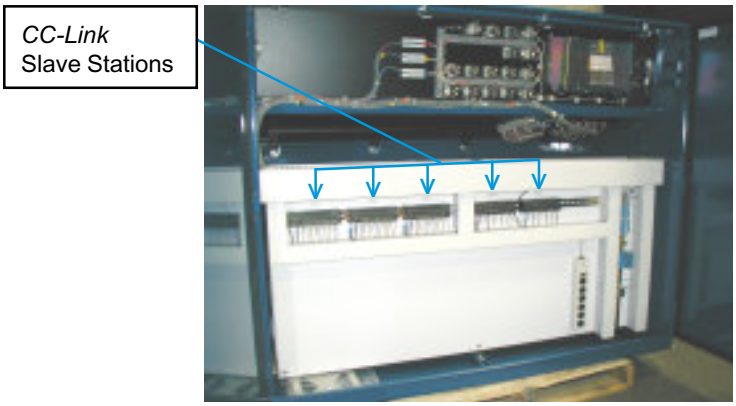
Engle Printing - 32 Press Units
(Photo C)

A similar installation of these same presses can be seen at Press Enterprise in Bloomsburg, PA (Photo D). This installation consists of 2 four-color presses, each with a two console control unit. The two control consoles contain various operator interfaces and the *CC-Link* Slave and Master devices for communication to the individual press units.

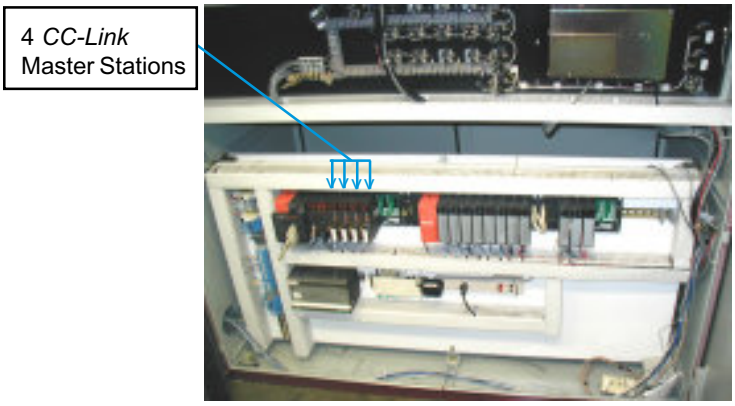


Press Enterprise - 8 Press Units
(Photo D)

Photo E shows the inside of the Slave console with several *CC-Link* slave I/O modules. Photo F shows the inside of the Master console with a Mitsubishi Q-Series PLC, four *CC-Link* Master stations and additional equipment. Each *CC-Link* Master station controls communication with one of the press units. This shows the independence of the individual press units and how they are integrated into a single four-color press through the use of the Mitsubishi Q-Series PLC.



Slave Console
(Photo E)



Master Console
(Photo F)

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