



GM Networks – EtherNet/ IP Online Course LMS 26359

(Version 6.0)

Contact Information

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Course Description

This course is designed to familiarize participants with the application of the GM Networks EtherNet/ IP standards. Upon successful completion of this course, participants will learn the evolution of EtherNet/IP, the difference between managed and unmanaged switches, understand execution design strategies and deployment. Understand how to troubleshoot networks, use Wireshark and network management software. Students will understand how to configure a Hirschmann Octopus switch.

Who Should Attend

- GM: Controls Engineers, and Designers
- Suppliers: Controls Engineers, and Designers
- Contractors: Controls Engineers, and Designers

Note: (This course uses GM's G16 Standard along with Hirschmann Octopus 2 switches.)

Student Materials

- All student materials are located on the Canvas LMS which contains:
- (8) Video lecture tutorials with integrated Exercises and Solutions.
- (8) PDF files consisting of content to follow along with while viewing the video lectures.

Needed for Exam

- Webcam
- Microphone
- Sufficient internet connection

To run a quick system check, go to: <http://remoteproctor.com/rpinstall>.



Course Outline

- **Module 1: EtherNet/IP History and Evolution** **3.5 Hours**
 - History of the Ethernet
 - Common network terminology
 - LANs, WANs, and VLANs
 - OSI and ARPANET reference models
 - Basic terminology of Ethernet
 - Recognize common Ethernet components
 - Switches used on Ethernet networks
 - IEE organization.
 - Assign MAC and IP addresses on an Ethernet network
 - Ethernet Frames
 - Contents of an IP Packet
 - Unicast, Broadcast, and Multicast messaging
 - Addressing Resolution Protocol (ARP)
 - Ethernet communication protocol path for messaging and real time I/O
 - Exercises
- **Module 2: Ethernet I/O** **2 Hours**
 - Ethernet I/O using Embedded Switch Technology
 - EtherNet/ IP DLR (Device Level Ring)
 - Ethernet I/O requires additional IP addresses
 - Routing EtherNet/IP traffic
 - Octopus II Switch
- **Module 3: Wireshark** **2.5 Hours**
 - Use Wireshark EtherNet management software
 - Start a capture
 - Packets on the network
 - Stop a capture
 - Save a file
 - Mirror a port
 - Find more help
 - Collect network data and traffic on a Hirschmann Octopus switch.
 - Port Mirroring
 - Exercises
- **Module 4: Robot Set-up Procedures** **1 Hour**
 - Set up process for EtherNet/IP IECN Project
 - Process to complete the Device Communication Detail Listing (DCDL)
 - The student will understand the tasks used in EtherNet/IP IECN Design and Approval Processes.
 - The EtherNet/IP IECN Logical Design process
 - The EtherNet/IP IECN Physical Design process



- The EtherNet/IP Network Design Approval Process
- The Design and Uplink Approval Process Flow Charts
- Exercises
- **Module 5: IECN (Industrial Ethernet Control Network (Security))** **0.75 Hours**
 - TBD
- **Module 6: Execution Deployment** **2 Hours**
 - Configure the IP addresses of a workstation
 - Locate the Global EtherNet eTools
 - Basic features of the Hirschmann Switch
 - Identify the software's used to configure a Hirschmann Octopus Switch
 - Switch Configuration eTool
 - Configure a Hirschmann Octopus Switch
 - Exercises
- **Module 7: Trouble shooting** **2 Hours**
 - Identify common network problems.
 - Troubleshoot common network problems.
 - Exercises
- **Module 8: Network Management Software** **0.5 Hours**
 - Remote Network Monitoring (RMON) Software Tool.
 - Network Management Software Tool.
 - Network Node Manager (NNM) Tool.

Student Certification **2.5 Hours**

- Students are required to take a (2.5) hour certification on Canvas LMS upon completion of the class.
- Students may use the GRS Student Manual and any documentation located in the GRS Online course during the test.
- Certification is worth 100 points – 80 points are needed to pass exam.
- This is a pass/fail competency certification – no grade will be given.
- If student passes with 80 points or better he/she will be considered certified and will be awarded 1.6 (CEU's) Continuing Education Units, which will apply to your Macomb Community College transcript.
- Student will also be mailed a Certificate.

Attendance

- This is self-paced course. Participants are expected to complete the GM Networks EtherNet/ IP Online course within (60) days from the date they receive their logon information from Macomb Community College.



Duration

- The *GM Networks EtherNet/ IP Online* course consists of successfully completing video lectures, exercises, and certification on the Canvas Learning Management System in a (60) day period.
- Certification Testing will occur online upon completion of the course. Student will be proctored and have 2.0 hours to complete the certification. The exam must be completed once it is started.
- Since this is self –paced course, committed hours vary due to student’s prior experience. Thus, it is critical that each participant block out enough time to contribute to his/her success.

Student Rights and Responsibilities

Student online and on-ground behavior must be in accordance with Macomb’s Handbook or Rights and Responsibilities <http://www.macomb.edu/NR/rdonlyres/08393098-75E2-4DA0-B534-07B76A0E6DC2/0/StudentHandbook.pdf> . Academic dishonesty will not be tolerated at Macomb Community College. Dishonesty, through cheating, plagiarism or other dishonest acts defeats the purpose and disgraces the mission and quality of Macomb College.

Software Requirement

Operating Systems

- Windows XP, Vista, Win 7 or higher.
- Mac OS X 10.4, 10.5, 10.6, 10.7 or higher.

Windows Browsers:

- Google Chrome version 60 or higher
- Internet Explorer version 11 and Edge 39 or higher
 - Make sure Windows Operating System is up to date

Mac Browsers:

- Safari version 9 and 10

Disable pop-up blockers when using Canvas

Recommended Software:

- Microsoft Office (Excel, Word, PowerPoint)
- Adobe Acrobat Reader

For technical issues such as a password reset, login issues, or compatibility concerns contact Macomb Online Support if you have questions or need assistance with CANVAS: onlinesupport@macomb.edu or 1.877.362.2662.