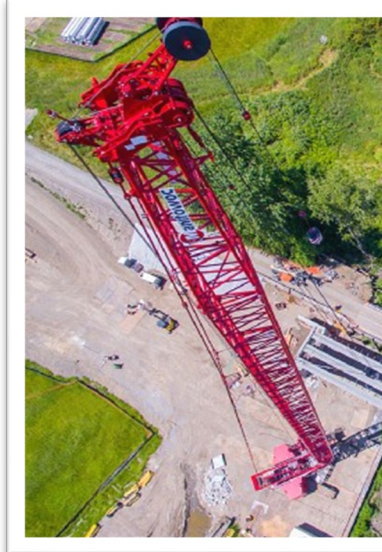
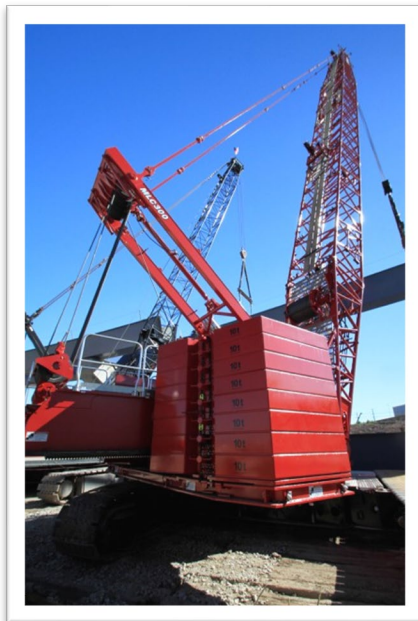


# TRAINING 2026

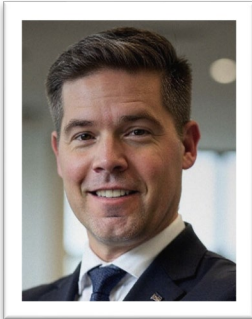
## Course catalog

*Manitowoc – Wisconsin, USA*

*Shady Grove – Pennsylvania, USA*



# Contacts and Trainers



**Andy Coy**  
Global Training Manager  
andrew.coy@manitowoc.com



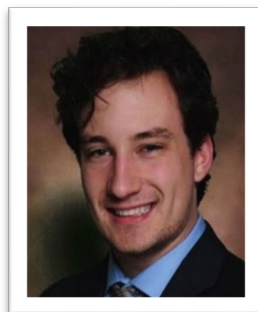
**Keith Opperman**  
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**Toni Pagliaro**  
Global Training Coordinator  
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**Pat Heckman**  
Training Instructor  
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**Ryan Kraemer**  
Training Instructor  
ryan.kraemer@manitowoc.com

## Our Capabilities:

Our factory-certified instructors offer operating systems, components, maintenance and repair training on all our products: Grove, GMK, Manitowoc, National Crane, and Potain.

The Manitowoc Product Support Training Center is an innovative leader in advanced crane industry training. Our onsite and online training curriculum is designed with your profits and your safety in mind. With professional and experienced instructors, our training helps you develop the product knowledge you need to be as productive as possible.

Please contact us if you are interested in Spanish-language instruction.

## Our Facilities:

**Shady Grove, PA:** This site offers multiple state of the art classrooms. A large hands-on simulator lab to include simulators of multiple generations of Grove domestic, GMK All Terrain and National Boom Truck operating systems. A multiple bay training building is also used to accommodate multiple products for troubleshooting and is currently equipped with a GMK4100L-1 dedicated solely for training purposes. A current CCS Potain tower crane is onsite dedicated solely for training purposes.

Available lab workstations:

- Three generations of GMK simulators to include RCL's
- Four generations of Grove domestic RCL simulators
- Four generations of Grove domestic simulators
- GHC simulator to include the RCL
- Multiple National Boom Truck simulators to include RCL's
- EPIC Hydraulic/Electrical Simulators
- Hydraulic and Electrical workstations
- Tower crane erection / dismantling / troubleshooting
- Mobile crane operation
- CCS equipped immersive operator simulator

**Manitowoc, WI:** This site offers multiple state of the art classrooms. 2 large hands-on simulator labs to include simulators of multiple generations of Manitowoc Conventional, EPIC, Canbus and CCS control systems.

Available lab workstations:

- 4 generations of Lattice Crane simulators, from conventional cranes to CCS generation;
- 8 hydraulic benches with pumps and motors that can simulate the function of the machines.
- 3 pneumatic benches with flex-air, quick-release, relay, and actuator valves
- Small Crawler simulator for the small Crawler range.
- A CCS cabin simulator with wireless remote
- CCS operations simulator with full 3D modeled working environment
- Also available in Portugal, Dubai and Brazil:
  - Epic Simulators
  - Canbus Version 1 and version 2 Simulator;
  - Crane in the box Simulator
  - CCS Simulator

Contact us for more information about our global training centers located in Australia, Brazil, Dubai, France, Germany, Italy, Mexico & Singapore.

# Travel Arrangement Info

Shady Grove, PA



## **Our Address:**

1565 Buchanan Trail East  
Shady Grove, PA 17256

## **Local Airports:**

Baltimore/Washington (BWI) International Airport  
Washington Dulles (IAD) International Airport  
Harrisburg, PA (MDT) International Airport  
Hagerstown Regional Airport (HGR)

Rental Car: A rental car will be required for transportation to and from the airport. A rental car will also be required for daily transportation to and from the Manitowoc Training Facility.

If transportation service is required; arrangements must be made prior to the start of class by contacting Toni Pagliaro at [Toni.Pagliaro@manitowoc.com](mailto:Toni.Pagliaro@manitowoc.com). **\*\*Please note\*\*** all transportation fees incurred will be billed in addition to the cost of the training course you are attending.

## **Recommended Hotels:**

1. Homewood Suites, 1650 Pullman Lane, Hagerstown, MD 21740  
Phone: (301) 665-3816
2. Springhill Suites by Marriott, 17280 Valley Mall, Hagerstown, MD 21740  
Phone: (301) 582-0011
4. Holiday Inn Express, 241 Railway Lane, Hagerstown, MD 21740  
Phone: (301) 745-5644
4. Courtyard by Marriott, 17270 Valley Mall Road, Hagerstown, MD 21740  
Phone: (301) 582-0043

Hotel arrangements, hotel expenses, transportation, breakfast and evening meals are the student's responsibilities.

Manitowoc does provide a catered lunch Monday-Thursday. No lunches are served on Fridays. Coffee, sodas, and bottled water are available daily in the training cafeteria at no cost to the students. Snacks are available anytime in the Training Cafeteria vending machine.



# Travel Arrangement Info

Manitowoc, WI

## Our Address:

3733 Dewey Street  
Manitowoc, WI 54220

## Local Airports:

Green Bay Austin Straubel Airport  
Milwaukee's Mitchell Field Airport

Rental Car: A rental car will be required for transportation to and from the airport. A rental car will also be required for daily transportation to and from the Manitowoc Training Facility.

## Recommended Hotels:

1. Cobblestone Hotel & Suites, 1407 16<sup>th</sup> Street, Two Rivers, WI 54241  
Phone: (920) 553-3632

2. Inn on Maritime Bay, 101 Maritime Drive, Manitowoc, Wisconsin, 54220  
Phone: (920) 682-7000

*\*Discounted rate: \$85/night! Enter Special Rates: Corporate Code 10000010563. Free YMCA passes given to students staying at the Inn on Maritime Bay if you mention you're staying for a Manitowoc Training class!*

Hotel arrangements, hotel expenses, transportation, breakfast and evening meals are the student's responsibilities.

Manitowoc does provide a catered lunch Monday-Thursday. No lunches are served on Fridays. Coffee, sodas, and bottled water are available daily in the training cafeteria at no cost to the students.

# Registration & Authorization

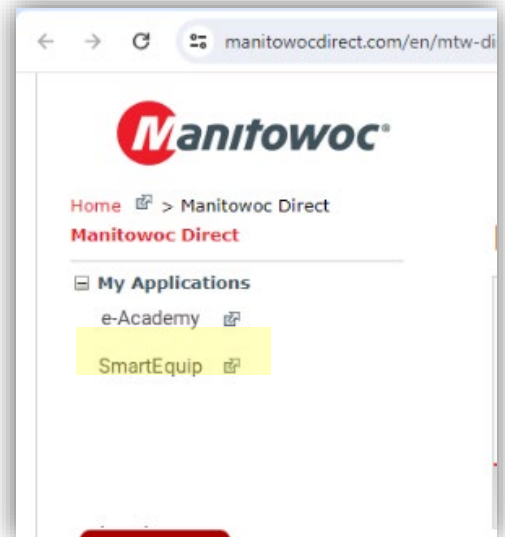


## To Request an Account:

To register to attend a training class, students must have a Manitowoc Direct account with access to the Manitowoc e-Academy application. Please visit this website and complete the required fields:

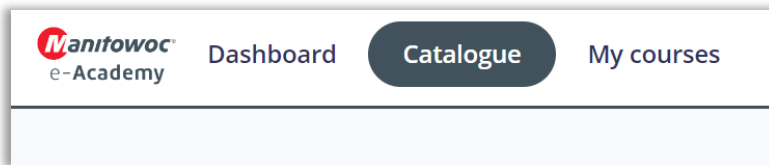
<http://www.manitowoccranes.com/en/manitowoc-direct/manitowoc-direct-request-access>

Once registered, users should login to Manitowoc Direct, click to expand My Applications, then select e-Academy to enter our website.



## Manitowoc e-Academy:

Once logged in, you will see a Catalogue section where you will find our available courses, with upcoming dates listed.



## Authorization:

“Certification” courses are no longer offered. Instead, dealer technicians are eligible to obtain a CANBUS, EPIC or CCS Lattice Authorization Card.

To achieve the Authorization card, a technician must:

- Complete all of the curriculum courses within that product line
- Obtain a cumulative 90% average for all curriculum courses

If their cumulative average falls below 90%, technicians are welcome to retake courses to improve their score.

Authorization cards will be valid for 3 years. To renew their Authorization, the technician must successfully pass a New Technology course within the product line training.

**Any Registration/Payment/Authorization questions should be directed to Toni Pagliaro: +1 (717)593-5918 or [toni.pagliaro@manitowoc.com](mailto:toni.pagliaro@manitowoc.com).**

<b>Section 1</b>	EPIC Courses	<b>Page 08 - 15</b>
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<b>Section 2</b>	CANBUS Courses	<b>Page 16 - 23</b>
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<b>Section 3</b>	CCS Courses	<b>Page 24 - 31</b>
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<b>Section 4</b>	Quick Start Red	<b>Page 32 - 33</b>
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<b>Section 5</b>	Model-Specific Courses	<b>Page 34 - 35</b>
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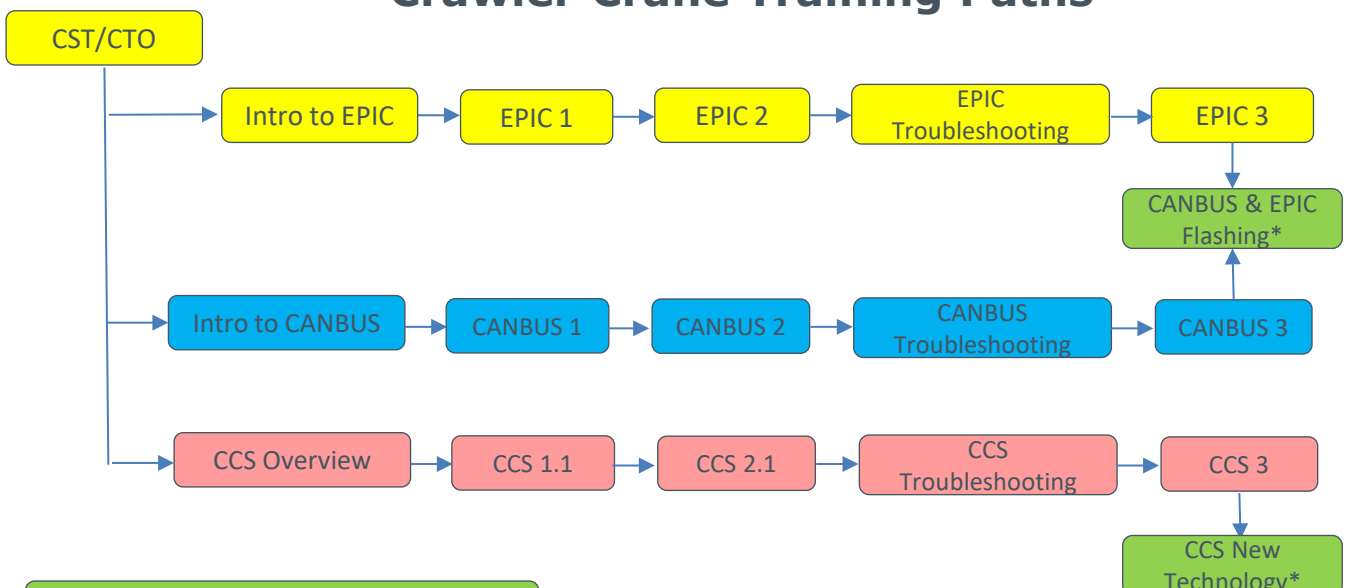
<b>Section 6</b>	e-Learning Modules	<b>Page 36</b>
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Course	Page	Course name
CST/CTO Combo	09	Crane System Theory / Crane Technology & Operation of lattice crawler cranes
Intro to EPIC	10	Introduction to the EPIC control system
EPIC 1	11	EPIC Level 1
EPIC 2	12	EPIC Level 2
EPIC Troubleshooting	13	Troubleshooting
EPIC 3	14	??
CANBUS & EPIC Flashing*	15	Flashing

To register for a course please use the e-Academy application on Manitowoc Direct. Instructions for requesting an account are found on page 5.

\*These courses are available ONLY for Grove dealer technicians.

## Manitowoc Lattice Boom Crawler Crane Training Paths



\*courses in green are for dealer techs only



# CST/CTO Lattice Combo



## Aim of training course:

The course acts as a technical introduction to all Manitowoc lattice crane systems and will be used as a prerequisite for all other lattice courses.

The course covers terminology and technologies relating to mechanical, hydraulic, and electronic systems. Manitowoc load charts and rigging drawings are explained along with exercises on how load charts are constructed, read, and used. The class will introduce all Manitowoc crane control systems. Exercises teach use of the main crane operator's display and the RCI.

The course covers how hydraulic, electrical, and pneumatic systems are used to achieve crane functions, emphasizing maintenance and troubleshooting. Students learn the use of Manitowoc schematics. Hydraulic and Electrical test benches are used for hands-on exercises.

## Prerequisites

- Must be over 18 years old
- Must bring their PPE
- Assorted eLearning modules

## Duration

- 4.5 days
- Monday 7:30 am to Friday 12:00 pm

## Number of participants

- 7 participants

## Program:

- Know common Manitowoc crane models and terminology.
- Be able to read and explain load charts.
- Understand rigging drawings.
- Familiarization with CCS, CANBUS, and EPIC control systems.
- RCI configuration and operation.
- Read Manitowoc schematics.

## Teaching Methods:

Detailed theoretical classroom instruction, hands-on exercises, eLearning modules, homework.

## Hardware/Software Provided:

None

## Equipment:

- Training room
- Technical Documents
- Simulators
- Hydraulic & electric test benches
- **Laptop Required**

## Cost:

- \$2,400 per student course fee\*

*\*dealer pricing may vary*

## Dates:

- Check the Manitowoc e-Academy in Manitowoc Direct for available course sessions.

## Aim of training course:

The course will showcase the operational systems of the 999 crane.

The service technicians will be guided through the electrical and hydraulic systems by studying the systems' schematics and manuals, and by participating in actual hands-on sessions.

The Load Indicator Systems will be covered to allow technicians to build the system knowledge and confidence to troubleshoot system problems. Specific Lab Units cover the 90 Series pump and 90 Series motor, Central Processing Unit (CPU), and breaking down the swing circuit. Additional units include understanding pressure vs. voltage as well as electrical and hydraulic systems for fixed and variable displacement pumps and motors.

### Prerequisites

- Must be over 18 years old
- Must bring their PPE
- CST/CTO Lattice

### Duration

- 4.5 days
- Monday 7:30 am to Friday 12:00 pm

### Number of participants

- 7 participants

## Program:

- Understand EPIC as used on 999.
- Use hydraulic and electrical schematics for troubleshooting.
- Use pressure gauges and flow meters for troubleshooting.
- Use Manitowoc Service Manual.
- Understand 999 hydraulic system.
- Set the hydraulic system pressure.
- Check and test transducers, multi-function valves, and pump control.
- Understand 999 electrical system.
- Check EPIC computer diagnostics.
- Perform calibrations.
- Set up the rated capacity indicator on the 999 crane.
- Understand 999 basic operation, troubleshooting and maintenance.

## Teaching Methods:

Detailed theoretical classroom instruction, hands-on exercises, eLearning module homework.

## Hardware/Software Provided:

None

## Equipment:

- Training room
- Technical Documents
- Simulators & test benches
- **Laptop Required**

## Cost:

- \$2,400 per student course fee\*

*\*dealer pricing may vary*

## Dates:

- Check the Manitowoc e-Academy in Manitowoc Direct for available course sessions.

## Aim of training course:

The course will showcase the operational systems of 777 and 888 cranes. Students will learn the 777 electrical and hydraulic systems by studying the systems' schematics, manuals; and by participating in actual hands-on sessions for travel, boom hoist and hoist. We will review faults, limits, troubleshooting and the 777-boom hoist leakage test.

Students will be taught the RCI to build system knowledge and confidence to troubleshoot system problems. Lab units will include 90 Series pump and 51 Series motor, Central Processing Unit (CPU), and breaking down the travel, boom hoist and hoist circuits plus changing data in the RCI. Specific classroom units include understanding the electrical and hydraulic systems for 777 pumps and motors.

### Prerequisites

- Must be over 18 years old
- Must bring their PPE
- Intro to EPIC

### Duration

- 4.5 days
- Monday 7:30 am to Friday 12:00 pm

### Number of participants

- 7 participants

## Program:

- Understand EPIC system used on model 777/888.
- Use schematics to troubleshoot.
- Use pressure gauges and flow meters for troubleshooting.
- Navigate the Service Manual.
- Understand the model 777 boom hoist cylinder.
- Set the hydraulic system pressure.
- Check and test transducers, multi-function valves, and pump control.
- Understand the electrical systems.
- Check EPIC computer diagnostics.
- Perform calibrations.
- Set up LMI on 777/888 cranes.

## Teaching Methods:

Detailed theoretical classroom instruction, hands-on exercises, eLearning module homework.

## Hardware/Software Provided:

None

## Equipment:

- Training room
- Technical Documents
- Simulators & test benches
- **Laptop Required**

## Cost:

- \$2,900 per student course fee\*

*\*dealer pricing may vary*

## Dates:

- Check the Manitowoc e-Academy in Manitowoc Direct for available course sessions.

## Aim of training course:

The course will showcase the operational systems of M250, Travel divert to hoist, and 2250 Main Hoist.

The service technicians will be guided through the M250 and 2250 electrical and hydraulic systems, by studying the system schematics and manuals, participate in actual hands-on sessions for boom hoist and hoist and divert, and review faults, limits, troubleshooting and the 2250. The Rated Capacity Indicator and CraneSTAR will be reviewed, which will allow technicians to build system knowledge and confidence in testing and troubleshooting system problems. In addition, the Central Processing Unit (CPU) and breaking down the boom hoist and hoist circuits. Specific classroom units include understanding the electrical and hydraulic systems for M250 and 2250 pumps and motors.

### Prerequisites

- Must be over 18 years old
- Must bring their PPE
- EPIC 1

### Duration

- 4.5 days
- Monday 7:30 am to Friday 12:00 pm

### Number of participants

- 7 participants

## Program:

- Understand EPIC system as used on the model 2250.
- Use schematics to troubleshoot.
- Use pressure gauges and flow meters for troubleshooting.
- Use the Service Manual.
- Understand the hydraulic system.
- Set the hydraulic system pressure.
- Check and test transducers, multi-function valves and pump control.
- Understand the electrical system.
- Check EPIC computer diagnostics.
- Perform calibrations.
- Use 2250 RCL system.
- Understand 2250/M250 operation, troubleshooting and maintenance.

## Teaching Methods:

Detailed theoretical classroom instruction, hands-on exercises, eLearning module homework.

## Hardware/Software Provided:

None

## Equipment:

- Training room
- Technical Documents
- Simulators & test benches
- **Laptop Required**

## Cost:

- \$2,600 per student course fee\*

*\*dealer pricing may vary*

## Dates:

- Check the Manitowoc e-Academy in Manitowoc Direct for available course sessions.

## Aim of training course:

The course will cover troubleshooting the Manitowoc EPIC control system. It will consist of an in-depth look at the onboard diagnostics including the RCI/RCL system. An overview of using the CST tool as well as harness and cable repair will also be covered. The 999 crane will be used for the hands-on and classroom. All classroom presentations will be reinforced with practical hands-on operation of the car body and upper works systems. Appropriate diagnostic cables and adapters will be provided for each student to keep.

## Program:

- Have an understanding of the On-board diagnostic system.
- Enhance troubleshooting skills.
- Understand the Different EPIC RCI/RCL systems.
- Using CST for EPIC Diagnostics.
- Repair harness and cables.
- Understand diagnostic screens
- Locate information in the Test voltages pages.

## Teaching Methods:

Detailed theoretical classroom instruction, hands-on exercises.

## Hardware/Software Provided:

None

## Equipment:

- Training room
- Technical Documents
- Simulators & test benches
- **Laptop Required**

## Cost:

- \$1,300 per student course fee\*

*\*dealer pricing may vary*

## Dates:

- Check the Manitowoc e-Academy in Manitowoc Direct for available course sessions.

## Prerequisites

- Must be over 18 years old
- Must bring their PPE
- EPIC 2

## Duration

- 3 days
- Tuesday 7:30 am to Thurs 4:00 pm

## Number of participants

- 7 participants

## Aim of training course:

This 3-day course will showcase the operational systems of the 2250 Luffing Jib Drum, Max-er 2000 and Luffing jib Struts. There will also be a discussion on the luffing jib and Wheeled Max-er on the 21000. The class size will be limited to Six (6) students. All classroom presentations will be reinforced with practical hands-on electrical systems. The course will be approximately 60% classroom and 40% practical.

## Program:

- Understand the Luffing jib & Wheeled Max-er used on the 2250 crane model
- Understand the Luffing jib & Wheeled Maxer used on the model 21000 crane
- Understand the Different EPIC RCI/RCL systems.
- Build & troubleshoot the Luffing Drum of the 2250
- Build & troubleshoot the Max-er 2000 strap cylinder
- Setup the Rated Capacity Indicator for the Max-er Luffing

## Teaching Methods:

Detailed theoretical classroom instruction, hands-on exercises.

## Hardware/Software Provided:

None

## Equipment:

- Training room
- Technical Documents
- Simulators & test benches
- **Laptop Required**

## Cost:

- \$2,600 per student course fee\*

*\*dealer pricing may vary*

## Dates:

- Check the Manitowoc e-Academy in Manitowoc Direct for available course sessions.

## Prerequisites

- Must be over 18 years old
- Must bring their PPE
- EPIC 2

## Duration

- 3 days
- Tuesday 7:30 am to Thurs 4:00 pm

## Number of participants

- 7 participants

## Aim of training course:

This 4-day course will cover the use of the crane service tool to program the EPIC and CANBus operating systems used on the Manitowoc lattice products. The class size will be limited to eight (8) students. All classroom presentations will be reinforced by hands on lab exercises and in class work sheets. The course will be approximately 60% classroom and 40% practical. The topics that will be covered are installation of the service tool, File management and use of Kiteworks, programming of the EPIC CPU and RCL. Programming master nodes and universal nodes for the CAN Bus cranes.

In addition, there will be daily quizzes and homework followed by a final written test on the last day.

### Prerequisites

- Must be over 18 years old
- Must bring their PPE
- EPIC 3 or CANBUS 3

### Duration

- 4 days
- Monday 7:30 am to Thurs 4:00 pm

### Number of participants

- 7 participants

## Program:

- Use the crane service tool & related cables to program CPU boards, RCL displays, master nodes & universal nodes
- Identify the software versions for the different model cranes
- Verify that the proper software was installed in the crane
- View the configuration file values to ensure the crane options are correct
- Check the RCL for correct software version & chart data
- Know the correct reporting procedure to update the Product Support Team on software updates made in the field

## Teaching Methods:

Detailed theoretical classroom instruction, hands-on exercises.

## Hardware/Software Provided:

EPIC and CANBus programming cable

## Equipment:

- Training room
- Technical Documents
- Simulators & test benches
- **Laptop Required**

## Cost:

- \$2,900 per student course fee\*  
*\*dealer pricing may vary*

## Dates:

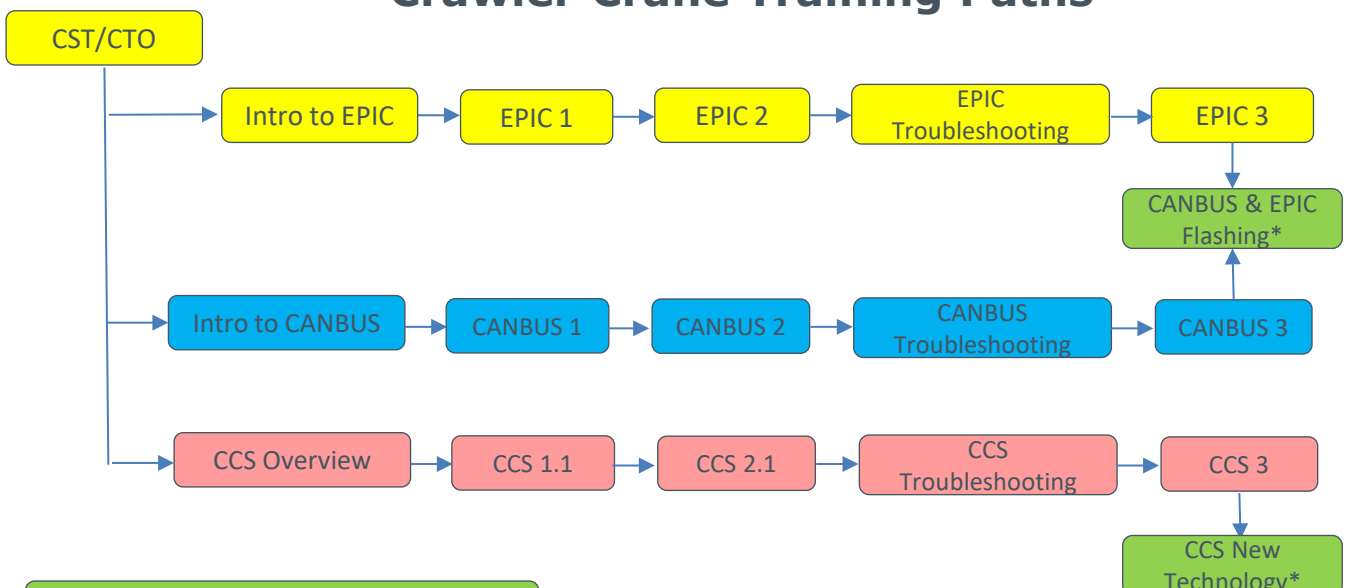
- Check the Manitowoc e-Academy in Manitowoc Direct for available course sessions.

Course	Page	Course name
CST/CTO Combo	17	Crane System Theory / Crane Technology & Operation of lattice crawler cranes
Intro to CANBUS	18	Introduction to the CANBUS control system
CANBUS 1	19	CANBUS Level 1
CANBUS 2	20	CANBUS Level 2
CANBUS Troubleshooting	21	Troubleshooting
CANBUS 3	22	??
CANBUS & EPIC Flashing	23	Flashing

To register for a course please use the e-Academy application on Manitowoc Direct. Instructions for requesting an account are found on page 5.

\*These courses are available ONLY for Grove dealer technicians.

## Manitowoc Lattice Boom Crawler Crane Training Paths



\*courses in green are for dealer techs only



# CST/CTO Lattice Combo



## Aim of training course:

The course acts as a technical introduction to all Manitowoc lattice crane systems and will be used as a prerequisite for all other lattice courses.

The course covers terminology and technologies relating to mechanical, hydraulic, and electronic systems. Manitowoc load charts and rigging drawings are explained along with exercises on how load charts are constructed, read, and used. The class will introduce all Manitowoc crane control systems. Exercises teach use of the main crane operator's display and the RCI.

The course covers how hydraulic, electrical, and pneumatic systems are used to achieve crane functions, emphasizing maintenance and troubleshooting. Students learn the use of Manitowoc schematics. Hydraulic and Electrical test benches are used for hands-on exercises.

## Prerequisites

- Must be over 18 years old
- Must bring their PPE
- Assorted eLearning modules

## Duration

- 4.5 days
- Monday 7:30 am to Friday 12:00 pm

## Number of participants

- 7 participants

## Program:

- Know common Manitowoc crane models and terminology.
- Be able to read and explain load charts.
- Understand rigging drawings.
- Familiarization with CCS, CANBUS, and EPIC control systems.
- RCI configuration and operation.
- Read Manitowoc schematics.

## Teaching Methods:

Detailed theoretical classroom instruction, hands-on exercises, eLearning modules, homework.

## Hardware/Software Provided:

None

## Equipment:

- Training room
- Technical Documents
- Simulators
- Hydraulic & electric test benches
- **Laptop Required**

## Cost:

- \$2,400 per student course fee\*

*\*dealer pricing may vary*

## Dates:

- Check the Manitowoc e-Academy in Manitowoc Direct for available course sessions.

# Intro to CANBUS



## Aim of training course:

The course will showcase the operational systems of the version 1 Canbus system. The students will be guided through the electrical and hydraulic systems. This will be done by studying the crane schematics. Extensive in-depth sessions of the machine's Rated Capacity Indicator (RCI) system will allow technicians to build the necessary system knowledge and confidence to troubleshoot system problems.

Quizzes and tasks will be assigned to give technicians another opportunity to gain and retain the daily information covered in these sessions. Specific Lab Units covered will be 90 Series pump, Master Node, Universal Node, Boom Node and breaking down the swing, and RCI circuits. Specific classroom units include understanding pressure vs. voltage, electrical and hydraulic systems for fixed and variable displacement pumps and motors.

### Prerequisites

- Must be over 18 years old
- Must bring their PPE
- CST/CTO Lattice

### Duration

- 4.5 days
- Monday 7:30 am to Friday 12:00 pm

### Number of participants

- 6 participants

## Program:

- Troubleshoot using schematics.
- Use of gauges and flow meters.
- Use the Service Manual.
- Understand the MLC165's Version 1 CANBUS system.
- Tell the difference in a version 1 and version 2 CANBUS machine.
- Understand hydraulic system.
- Set the system pressure.
- Check and test transducers, multi-function valves, and hydraulic pump controls.
- Understand electrical system.
- Check nodes with ohm meter.
- Test harnesses, bin nodes, and CANBUS shorting plugs.
- Do calibrations on v1 CANBUS.
- Set up the RCI on v1 CANBUS.

## Teaching Methods:

Detailed theoretical classroom instruction, hands-on exercises.

## Hardware/Software Provided:

None

## Equipment:

- Training room
- Technical Documents
- Simulators & test benches
- **Laptop Required**

## Cost:

- \$2,900 per student course fee\*

*\*dealer pricing may vary*

## Dates:

- Check the Manitowoc e-Academy in Manitowoc Direct for available course sessions.

## Aim of training course:

The course will cover the theory of operation for the travel, drum 4, crane wireless systems and rate capacity indicator. It will consist of the version 1-style Canbus machines. The 555, 1015 and 18000 will be covered during this class. The 18000 crane will be used for the hands-on and classroom.

All classroom presentations will be reinforced with practical hands-on operation of the car body and upper works systems.

Students will build the complete electrical and hydraulic for the 18000 travel system, the 18000 drum 4, and the 555 freefall.

## Program:

- Understand v1 CANBUS system on the 555, 1015 and 18000.
- Enhance troubleshooting skills.
- Understand 18000 cranes with and without supercharge pump.
- Identify the cab differences on version 1 cranes.
- Understand electrical system.
- Check Canbus communication.
- Set thresholds and pressure compensation overrides.
- Understand the 555 and 1015 freefall operation.
- Perform calibrations v1 Canbus.
- Set up the v1 Canbus RCI.
- Set up boom system with wired and wireless load links.

## Teaching Methods:

Detailed theoretical classroom instruction, hands-on exercises.

## Hardware/Software Provided:

None

## Equipment:

- Training room
- Technical Documents
- Simulators & test benches
- **Laptop Required**

## Cost:

- \$2,900 per student course fee\*

*\*dealer pricing may vary*

## Dates:

- Check the Manitowoc e-Academy in Manitowoc Direct for available course sessions.

### Prerequisites

- Must be over 18 years old
- Must bring their PPE
- Intro to CANBUS

### Duration

- 4.5 days
- Monday 7:30 am to Friday 12:00 pm

### Number of participants

- 6 participants

## Aim of training course:

The course will cover the theory of operation of the Travel, Drum 4, and Rate Capacity Indicator. It will consist of the version 2 style Canbus machines. The European 15000, 14000, and 16000 will be covered during this class. The 14000 and 16000 cranes will be used for the hands-on program and classroom lecture.

All classroom presentations will be reinforced with practical hands-on operation of the car body and upper works systems.

Students will build the complete electrical and hydraulic for the 16000 travel system, the 16000 drum 4, and the 14000 drum 1.

## Program:

- Understand v2 Canbus system on 15000, 16000, and 14000.
- Set the hydraulic pressures.
- Understand electrical system.
- Check Canbus communication.
- Set thresholds & pressure compensation over-rides.
- Use the 14000 cab test bench for troubleshooting experience.
- Understand the 14000 freefall.
- Set up the RCI on v2 cranes.
- Know difference between gen 1 and gen 2 displays.
- Perform calibrations.
- Build on their troubleshooting skills on Canbus system cranes.

## Teaching Methods:

Detailed theoretical classroom instruction, hands-on exercises.

## Hardware/Software Provided:

None

## Equipment:

- Training room
- Technical Documents
- Simulators & test benches
- **Laptop Required**

## Cost:

- \$2,800 per student course fee\*

*\*dealer pricing may vary*

## Dates:

- Check the Manitowoc e-Academy in Manitowoc Direct for available course sessions.

### Prerequisites

- Must be over 18 years old
- Must bring their PPE
- CANBUS 1

### Duration

- 4.5 days
- Monday 7:30 am to Friday 12:00 pm

### Number of participants

- 6 participants

## Aim of training course:

The course will cover troubleshooting the Manitowoc CANbus Version 1 and Version 2 control system. It will consist of an in-depth look at the onboard diagnostics including the RCI/RCL system. An overview of using the CST tool as well as harness and cable repair will also be covered.

All classroom presentations will be reinforced with practical hands-on operation of the car body and upper works systems. Appropriate diagnostic cables and adapters will be provided for each student to keep.

### Prerequisites

- Must be over 18 years old
- Must bring their PPE
- CANBUS 2

### Duration

- 3 days
- Tuesday 7:30 am to Thurs 4:00 pm

### Number of participants

- 6 participants

## Program:

- Have an understanding of the On-board diagnostic system.
- Enhance troubleshooting skills.
- Understand the RCI/RCL systems.
- Using CST for Diagnostics.
- Repair harnesses and cables.
- Understand diagnostic screens
- Locating diagnostic information in the Service manual

## Teaching Methods:

Detailed theoretical classroom instruction, hands-on exercises.

## Hardware/Software Provided:

None

## Equipment:

- Training room
- Technical Documents
- Simulators & test benches
- **Laptop Required**

## Cost:

- \$1,300 per student course fee\*

*\*dealer pricing may vary*

## Dates:

- Check the Manitowoc e-Academy in Manitowoc Direct for available course sessions.

## Aim of training course:

This 3-day course will cover the theory of operation for the 16000 and 18000 luffing Jib drums along with wheeled Maxer operations for both models. The class will consist of the Luffing Jib and Maxer for the 18000 and 16000 crane models. The class size will be limited to eight (8) students. All classroom presentations will be reinforced with practical hands-on operation of the Luffing Jib and Maxer attachments.

The course will be approximately 40% classroom and 60% practical.

### Prerequisites

- Must be over 18 years old
- Must bring their PPE
- CANBUS 2

### Duration

- 3 days
- Tuesday 7:30 am to Thurs 4:00 pm

### Number of participants

- 6 participants

## Program:

- Have an understanding of the Luffing jibs & Wheeled Maxer used on the 18000 crane model
- Have an understanding of the Luffing jib & Wheeled Maxer used on the 16000 crane model
- Have an understanding of the Luffing Jib Stop position cylinder used on the 18000 luffing jib
- Build & troubleshoot the 18000 drum 6 luffing drum hoist system
- Build & troubleshoot the wheeled Maxer used on the 18000 crane
- Build & troubleshoot the 16000 drum 3 luffing drum hoist system
- Setup both versions 1 & 2 Rated Capacity Indicators for Maxer and Luffing Jib configuration

## Teaching Methods:

Detailed theoretical classroom instruction, hands-on exercises.

## Hardware/Software Provided:

None

## Equipment:

- Training room
- Technical Documents
- Simulators & test benches
- **Laptop Required**

## Cost:

- \$2,900 per student course fee\*

*\*dealer pricing may vary*

## Dates:

- Check the Manitowoc e-Academy in Manitowoc Direct for available course sessions.

## Aim of training course:

This 4-day course will cover the use of the crane service tool to program the EPIC and CANBus operating systems used on the Manitowoc lattice products. The class size will be limited to eight (8) students. All classroom presentations will be reinforced by hands on lab exercises and in class work sheets. The course will be approximately 60% classroom and 40% practical. The topics that will be covered are installation of the service tool, File management and use of Kiteworks, programming of the EPIC CPU and RCL. Programming master nodes and universal nodes for the CAN Bus cranes.

In addition, there will be daily quizzes and homework followed by a final written test on the last day.

### Prerequisites

- Must be over 18 years old
- Must bring their PPE
- EPIC 3 or CANBUS 3

### Duration

- 4 days
- Monday 7:30 am to Thurs 4:00 pm

### Number of participants

- 7 participants

## Program:

- Use the crane service tool & related cables to program CPU boards, RCL displays, master nodes & universal nodes
- Identify the software versions for the different model cranes
- Verify that the proper software was installed in the crane
- View the configuration file values to ensure the crane options are correct
- Check the RCL for correct software version & chart data
- Know the correct reporting procedure to update the Product Support Team on software updates made in the field

## Teaching Methods:

Detailed theoretical classroom instruction, hands-on exercises.

## Hardware/Software Provided:

EPIC and CANBus programming cable

## Equipment:

- Training room
- Technical Documents
- Simulators & test benches
- **Laptop Required**

## Cost:

- \$2,900 per student course fee\*  
*\*dealer pricing may vary*

## Dates:

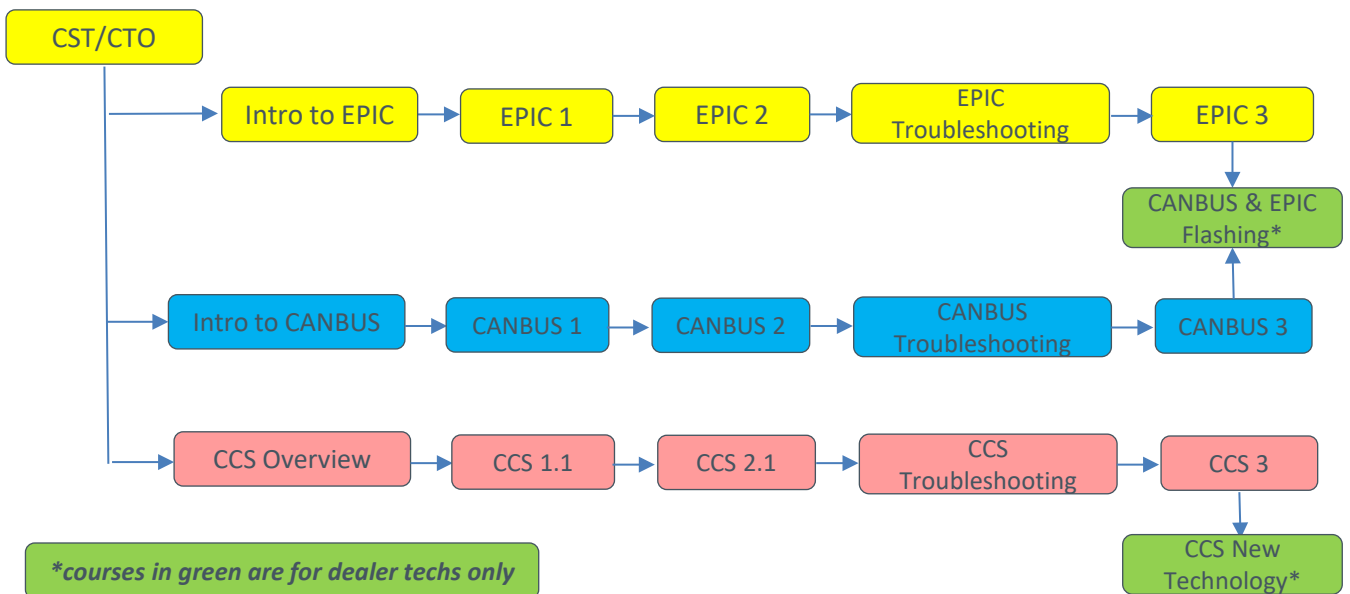
- Check the Manitowoc e-Academy in Manitowoc Direct for available course sessions.

Course	Page	Course Description
CST/CTO Combo	25	Crane System Theory / Crane Technology & Operation of lattice crawler cranes
CCS Overview	26	Introduction to the CCS control system on Manitowoc lattice boom crawler cranes
CCS 1.1	27	CCS Lattice Level 1
CCS 2.1	28	CCS Lattice Level 2
CCS Troubleshooting	29	CCS Lattice Troubleshooting
CCS 3	29	CCS Lattice Level 3
CCS New Tech	30	CCS Lattice New Technology

To register for a course please use the e-Academy application on Manitowoc Direct. Instructions for requesting an account are found on page 5.

\*These courses are available ONLY for Grove dealer technicians.

## Manitowoc Lattice Boom Crawler Crane Training Paths



\*courses in green are for dealer techs only



# CST/CTO Lattice Combo



## Aim of training course:

The course acts as a technical introduction to all Manitowoc lattice crane systems and will be used as a prerequisite for all other lattice courses.

The course covers terminology and technologies relating to mechanical, hydraulic, and electronic systems. Manitowoc load charts and rigging drawings are explained along with exercises on how load charts are constructed, read, and used. The class will introduce all Manitowoc crane control systems. Exercises teach use of the main crane operator's display and the RCI.

The course covers how hydraulic, electrical, and pneumatic systems are used to achieve crane functions, emphasizing maintenance and troubleshooting. Students learn the use of Manitowoc schematics. Hydraulic and Electrical test benches are used for hands-on exercises.

## Prerequisites

- Must be over 18 years old
- Must bring their PPE
- Assorted eLearning modules

## Duration

- 4.5 days
- Monday 7:30 am to Friday 12:00 pm

## Number of participants

- 7 participants

## Program:

- Know common Manitowoc crane models and terminology.
- Be able to read and explain load charts.
- Understand rigging drawings.
- Familiarization with CCS, CANBUS, and EPIC control systems.
- RCI configuration and operation.
- Read Manitowoc schematics.

## Teaching Methods:

Detailed theoretical classroom instruction, hands-on exercises, eLearning modules, homework.

## Hardware/Software Provided:

None

## Equipment:

- Training room
- Technical Documents
- Simulators
- Hydraulic & electric test benches
- **Laptop Required**

## Cost:

- \$2,400 per student course fee\*

*\*dealer pricing may vary*

## Dates:

- Check the Manitowoc e-Academy in Manitowoc Direct for available course sessions.

# CCS Lattice Overview



## Aim of training course:

The course includes the analysis of information contained in the several crane manuals, for the Crane Control System that is now implemented in the cranes built by Manitowoc. During the course, the Crane Assembly Procedure will be explained, as well the fundamentals of the CCS; how the different components are distributed throughout the crane; the steps to configure the RCI/RCL system and set it up. This class will feature the Manitowoc Lattice Crane model MLC100-1. The following subjects will be covered:

- Assembly procedure as shown in the Operator's Manual, from offloading trailers, to boom rigging and assembly to RCI/RCL setup.
- Layout and functional properties of all cab controls.
- Specific Lab Units covered will be IOL, IOS, CCM and SCM modules and breaking down the swing and travel circuits.

### Prerequisites

- Must be over 18 years old
- Must bring their PPE
- CST/CTO Lattice

### Duration

- 4.5 days
- Monday 7:30 am to Friday 12:00 pm

### Number of participants

- 8 participants

## Program:

- Learn safe assembly of crane as shown in the Operator's Manual.
- Identify operators Cab Controls.
- Proper configuration of RCI/RCL based on load chart specifications, and navigation of the CCS menus.
- Know the components, and layout of the Canbus structure of the CCS.
- Understand both closed and open loop hydraulic systems equipped on the model MLC100-1.
- Calibrate hydraulic system.
- Identifying and connecting the modules for each crane network
- Build the MLC100-1 swing and travel circuits electronically and hydraulically.

## Teaching Methods:

Detailed theoretical classroom instruction, hands-on exercises, eLearning modules, homework.

## Hardware/Software Provided:

None

## Equipment:

- Training room
- Technical Documents
- Simulators
- **Laptop Required**

## Cost:

- \$2,600 per student course fee\*

*\*dealer pricing may vary*

## Dates:

- Check the Manitowoc e-Academy in Manitowoc Direct for available course sessions.

## Aim of training course:

This course will cover the theory of operation for the travel, drum 4 and rate capacity indicator. The MLC150-1 and MLC100-1 with related models will be covered during this class.

The MLC150-1 crane will be used for the hands-on and classroom. All classroom presentations will be reinforced with practical hands-on operation of the car body and upper works systems. Appropriate diagnostic cables and adapters will be provided for each student to keep.

## Program:

- Understand the CCS system used on the MLC150-1 and MLC100-1.
- Enhance troubleshooting skills.
- Understand electrical schematic.
- Check Canbus communication.
- Build MLC150-1 travel complete electrical and hydraulic system.
- Set thresholds and pressure compensation over-rides.
- Build both the MLC150-1 Drum 4, and Drum 1 complete electrical and hydraulic system in the lab.
- Set the drum motor threshold adjustment in the lab.
- Perform calibrations.
- Set up a complete boom system.

## Teaching Methods:

Detailed theoretical classroom instruction, hands-on exercises, eLearning modules, homework.

## Hardware/Software Provided:

None

## Equipment:

- Training room
- Technical Documents
- Simulators
- **Laptop Required**

## Cost:

- \$2,900 per student course fee\*

*\*dealer pricing may vary*

## Dates:

- Check the Manitowoc e-Academy in Manitowoc Direct for available course sessions.

## Prerequisites

- Must be over 18 years old
- Must bring their PPE
- CCS Overview

## Duration

- 4.5 days
- Monday 7:30 am to Friday 12:00 pm

## Number of participants

- 8 participants

# CCS Lattice Level 2.1



## Aim of training course:

The course will cover the theory of operation for the travel, drum 4, crane wireless systems and rated capacity indicator. The MLC300 and MLC650 will be covered during this class.

The MLC650 crane will be used for the hands-on labs and classroom. All classroom presentations will be reinforced with practical hands-on operation of the car body and upper works systems.

Hands-on labs include building the MLC650 travel complete electrical and hydraulic system. Building the MLC650 Drum 4 complete electrical and hydraulic system. And building the Variable Position Counterweight system.

### Prerequisites

- Must be over 18 years old
- Must bring their PPE
- CCS Lattice Level 1.1

### Duration

- 4.5 days
- Monday 7:30 am to Friday 12:00 pm

### Number of participants

- 8 participants

## Program:

- Have an understanding of the CCS system on MLC300 and MLC650.
- Enhance troubleshooting skills.
- Use the crane service tool with customer level access.
- Understand electrical system.
- Check Canbus communication by information covered in this class.
- Set threshold and pressure compensation overrides.
- Troubleshoot the VPC system.
- Understand the in-cab ground-bearing pressure estimator.
- Explain and work with the Locked Counterweight feature
- Perform calibrations.
- Set up the RCI.

## Teaching Methods:

Detailed theoretical classroom instruction, hands-on exercises, eLearning modules, homework.

## Hardware/Software Provided:

None

## Equipment:

- Training room
- Technical Documents
- Simulators
- **Laptop Required**

## Cost:

- \$2,600 per student course fee\*

*\*dealer pricing may vary*

## Dates:

- Check the Manitowoc e-Academy in Manitowoc Direct for available course sessions.

# CCS Lattice Troubleshooting



## Aim of training course:

The course will give students further troubleshooting experience with the CCS control system as used on the MLC100-1, MLC150-1, MLC250, MLC300, and MLC650. This course is designed for students who have not had the opportunity to spend time on the aforementioned equipment and would benefit for more hand-on time with lattice CCS.

This course will provide an overview of CCS electrical and hydraulic troubleshooting documents and will offer hands-on troubleshooting opportunities using CCS training simulators. Common troubleshooting procedures will be discussed pertaining to the following topics:

- RCI setup
- VPC operation
- Control module diagnostics
- Fault code reading
- Angle and load sensor diagnostics
- Hydraulic pump and motor troubleshooting

## Prerequisites

- Must be over 18 years old
- Must bring their PPE
- CCS Lattice Level 2.1

## Duration

- 4 days
- Monday 7:30 am to Thurs 4:00 pm

## Number of participants

- 8 participants

## Program:

- Understand cab/display controls and features for troubleshooting
- Complete proper configuration of RCI/RCL based on load chart specifications, and RCI/RCL fault diagnostics
- Practice diagnosis of problems in the Canbus structure of a CCS machine
- Complete hands-on lab exercises on the following topics:
- Identifying and connecting CCS modules for each Canbus network
- Building a travel, Boom Hoist, and Hoist Drum hydraulic and electrical troubleshooting circuits

## Teaching Methods:

Detailed theoretical classroom instruction, hands-on exercises, eLearning modules, homework.

## Hardware/Software Provided:

None

## Equipment:

- Training room
- Technical Documents
- Simulators
- **Laptop Required**

## Cost:

- \$1,300 per student course fee\*

*\*dealer pricing may vary*

## Dates:

- Check the Manitowoc e-Academy in Manitowoc Direct for available course sessions.

# CCS Lattice Level 3



## Aim of training course:

The course will cover the theory of operation for the Luffing drum operation, VPC Max used, on the MLC650 and MLC300. The MLC300 crane will be used for the hands-on and classroom. Students will be given the dealer access software.

All classroom presentations will be reinforced with practical hands-on operation of the car body and upper works systems.

Labs include building MLC300 Luffing drum complete electrical and hydraulic system and building the MLC300 VPC max complete electrical and hydraulic system in the lab.

## Prerequisites

- Must be over 18 years old
- Must bring their PPE
- CCS Lattice Troubleshooting

## Duration

- 4.5 days
- Monday 7:30 am to Friday 12:00 pm

## Number of participants

- 8 participants

## Program:

- Understand the CCS control system as used on the Model MLC300 and MLC650 cranes with Variable Position Counterweight with the Max attachment.
- Understand the Luffing Jib Drums and Operation.
- Use the dealer level crane service tool with programming level will be taught to dealer technicians.
- Check Canbus communication by information covered in this class.
- Perform VPC Max calibration.
- Perform VPC tray calibration.
- Set up the Manitowoc rated capacity indicator to the VPC Max and VPC Luffing configuration.

## Teaching Methods:

Detailed theoretical classroom instruction, hands-on exercises, eLearning modules, homework.

## Hardware/Software Provided:

CCS Programming Harness and Peak Adapter  
CST software (Dealer level)

## Equipment:

- Training room
- Technical Documents
- Simulators
- **Laptop Required**

## Cost:

- \$2,600 per student course fee\*  
*\*dealer pricing may vary*

## Dates:

- Check the Manitowoc e-Academy in Manitowoc Direct for available course sessions.

# CCS Lattice New Technology



## Aim of training course:

The class was designed for students that have been through the CCS Program. The course is designed to keep attendees informed on the current and upcoming crane and CCS Lattice system.

This class is an ongoing and changing program in order for the attendees to stay on top of the CCS Crawler changes. There will be extensive hands-on for this program. The systems can vary based on new technology.

All classroom presentations will be reinforced with practical hands-on operation of the carbody and upper works systems.

### Prerequisites

- Must be over 18 years old
- Must bring their PPE
- CCS Lattice Level 3

### Duration

- 4 days
- Monday 7:30 am to Thurs 4:00 pm

### Number of participants

- 8 participants

## Program:

- Be brought up to date on the latest crane systems.
- Be taught the latest RCI systems.
- Have a chance to bring up topics for discussion based on changes from the last time at school.
- Be taught the newest hydraulic motor controls based on changes from the last time at school.
- Be taught the newest hydraulic pump controls based on changes from the last time at school.
- Be tested by a hands-on shop exercise.

## Teaching Methods:

Detailed theoretical classroom instruction, hands-on exercises, eLearning modules, homework.

## Hardware/Software Provided:

CST software (Dealer level)

## Equipment:

- Training room
- Technical Documents
- Simulators
- **Laptop Required**

## Cost:

- \$2,900 per student course fee\*

*\*dealer pricing may vary*

## Dates:

- Check the Manitowoc e-Academy in Manitowoc Direct for available course sessions.

# Quick Start Red



Course	Page	Course name
QSP Course 1		CST/CTO Combo for QSP
QSP Course 2		Manitowoc CCS Lattice
QSP Course 3		Manitowoc CANBUS
QSP Course 4		Manitowoc EPIC
QSP Course 5		Manitowoc Flashing





## Aim of Training Program:

To help newly hired technicians obtain a 'generalist' education in a given curriculum, we have created the 'Quick Start' program. Quick Start is designed for "green" technicians with little to no crane industry experience or prior training.

Students enrolled in the program will be attending an in-person training class with us every 3 months and will be assigned multiple e-learning (online) courses to complete in between the in-person classes. The in-person classes are pre-scheduled and mandatory: you will sign up once for all 5 classes, so the dates are known from the onset of the program.

The in-person classes are fast-paced, and students are required to have hands-on time with the machines in between training classes to ensure the knowledge taught in the classroom is applied on the job.

### Prerequisites

- Must be over 18 years old
- Must bring their PPE
- Must be employed by Manitowoc dealer or direct account

### Duration

- 5 one-week of training over 15 months

### Number of participants

- 8 students per cohort

## Program:

- Provide a basic level of competence in the all electric over hydraulic control systems found on Manitowoc crawler cranes.
- Instill confidence in a new technician.
- Provide the technician with the tools they need to support customer needs safely.
- Provide and train on use of diagnostic software for EPIC, CANBUS, and CCS controls systems for Manitowoc product.

## Teaching Methods:

Detailed theoretical classroom instruction, hands-on exercises, homework assignments, supplemental eLearning materials, and working with a mentor.

## Hardware/Software Provided:

Various throughout program

## Equipment:

- Training room
- Technical Documents
- Simulators & test benches
- **Laptop Required**

## Cost:

- Contact Global Training Coordinator for more information

## Dates:

- Contact Global Training Coordinator for more information

# Model-Specific Courses

For Manitowoc customers



Course	Page	Course name
Model-Specific 1	35	<i>Model Customer Level 1</i>
Model-Specific 2	36	<i>Model Customer Level 2</i>

*These courses are designed specifically for Manitowoc customers.*



# Model-Specific Level 1



## Aim of Training Program:

Manitowoc offers training courses for the specific model of crane operated by our customers. These courses are designed to provide an overview of the key systems of the crane, crane documentation, basic maintenance principles, and function operation.

Model-specific classes are not part of the full technician development curriculum and do not satisfy any prerequisites in the training program.

Model-specific classes can be held in our training center using hydraulic and electrical test benches for the hands-on portion, or at a customer location using their crane.

Model-specific level 1 courses focus on general overview of standard lift crane functions and basic troubleshooting.

### Prerequisites

- Must be over 18 years old
- Must bring their PPE

### Duration

- Varies depending on model and location

### Number of participants

- Varies depending on model and location

## Program:

- Provide a basic understanding of the crane's main display and LMI/RCI display use.
- Teaches an overview of the specified model's control system.
- Review the travel, swing, hoist, boom hoist, and VPC (if applicable) functions on the specified model.

## Teaching Methods:

Detailed theoretical classroom instruction, hands-on exercises, homework assignments.

## Hardware/Software Provided:

None

## Equipment:

- Training room
- Technical Documents
- Test benches OR Crane
- **Laptop Required**

## Cost:

- Contact Global Training Coordinator for a quote

## Dates:

- Quote will include available dates for the customer to choose from.

# Model-Specific Level 2



## Aim of Training Program:

Manitowoc requires the completion of Model-Specific Level 1 training before attending the Model-Specific Level 2 course.

The Level 2 course focuses on more advanced system troubleshooting of the entire machine. Content can include but is not limited to attachments or non-standard lifting configurations. Proper calibration procedures and technical troubleshooting discussions will be given to cover any added systems.

Additional time is allotted for advanced system problem-solving discussions pertaining to requests given by the customer.

## Program:

- Provide an advanced understanding of all crane systems and relevant attachments.
- Teaches all calibration and proper troubleshooting procedures.
- Function specific hands-on activities will vary based on customer request or machine availability.

## Teaching Methods:

Detailed theoretical classroom instruction, hands-on exercises, homework assignments.

## Hardware/Software Provided:

None

## Equipment:

- Training room
- Technical Documents
- Test benches OR crane
- **Laptop Required**

## Cost:

- Contact Global Training Coordinator for a quote

## Dates:

- Quote will include available dates for the customer to choose from.

### Prerequisites

- Must be over 18 years old
- Must bring their PPE
- Relevant Model-Specific Level 1

### Duration

- Varies depending on model and location

### Number of participants

- Varies depending on model and location

# e-Learning Modules

## Supplemental Training Materials:

Manitowoc e-Academy includes dozens of approximately 15-30 minute long technical e-Learning modules for all skill levels.

These materials are best used to supplement, reinforce, or review the material covered during instructor-led training courses.

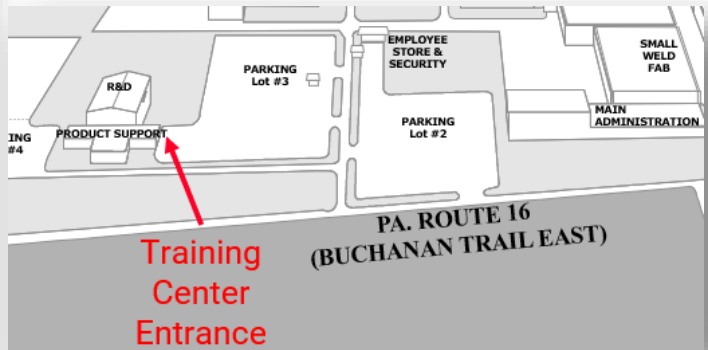
e-Learning modules are free of charge.

The screenshot shows the 'My learning' section of the Manitowoc e-Academy website. The navigation bar includes 'Home', 'Catalogue', and 'My learning'. The main content area is titled 'Courses' and shows search results for 'Introduction to Lattice Crawler Hydraulics' and 'Grove Gen. 3 RT LMDownload'. The left sidebar contains filters for 'SEARCH', 'PROGRESS', 'CATEGORIES', and 'MODALITY'. The search results are sorted by registration date and show 2 results. Each result card displays the course title, duration, and a 'CONTINUE' button. The 'Introduction to Lattice Crawler Hydraulics' course has 60 participants and a 30-minute duration. The 'Grove Gen. 3 RT LMDownload' course has 54 participants and a 20-minute duration. The 'NEXT STEP' section for each course shows a quiz or download link.

# Address/Map

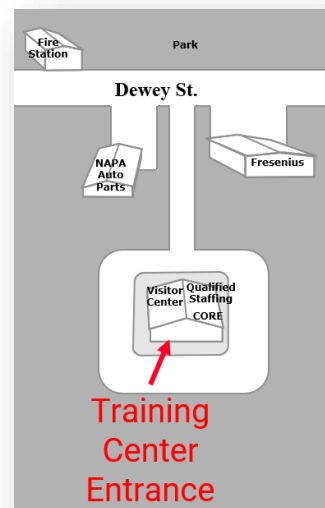
## Manitowoc Training Center - PA

1565 Buchanan Trail East  
Shady Grove, PA 17256  
[www.manitowoccranes.com](http://www.manitowoccranes.com)

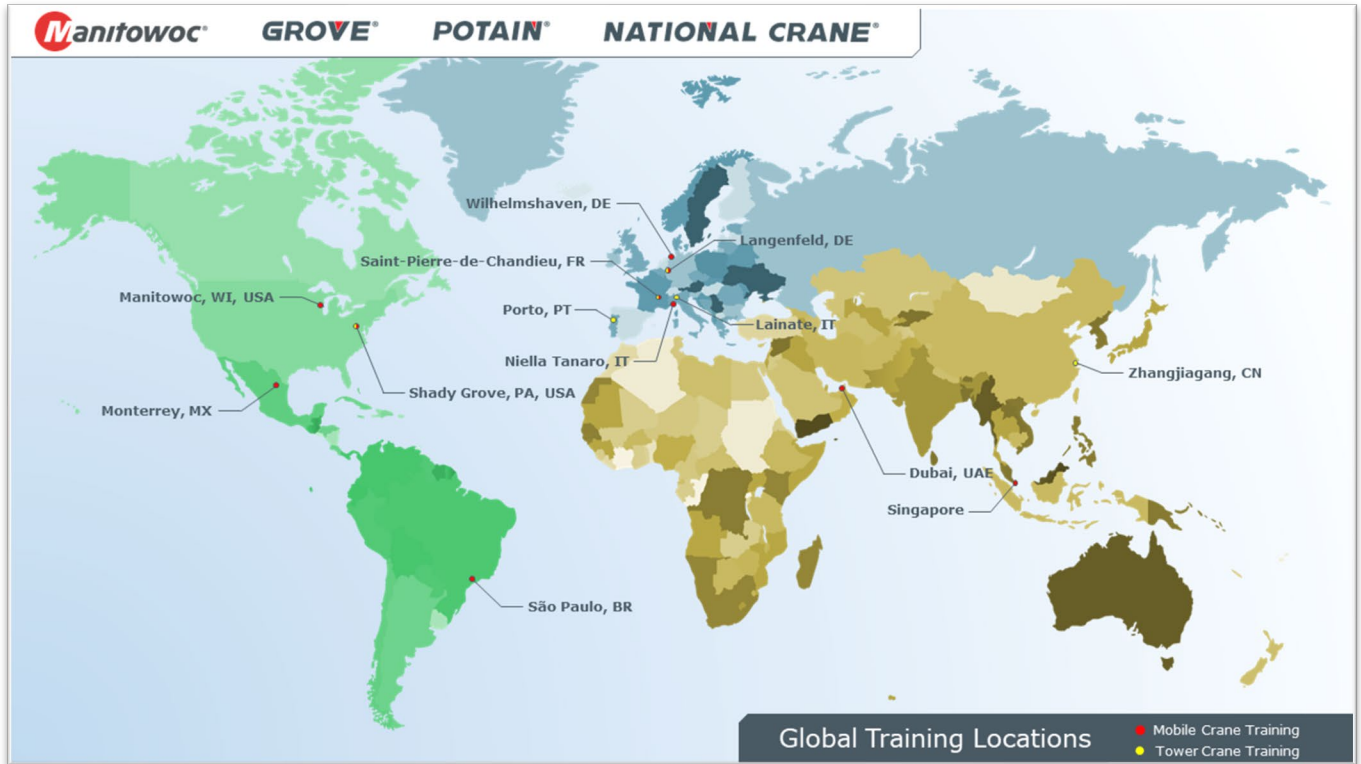


## Manitowoc Training Center - WI

3733 Dewey Street  
Manitowoc, WI 54220  
[www.manitowoccranes.com](http://www.manitowoccranes.com)



## Manitowoc Training Centers



### Manitowoc Customer Support when you need it.

The assurance of the world's most advanced crane service and support to get you back to work fast.



### Manitowoc Finance helps you get right to work generating profits for your business.

Financial tools that help you capitalize on opportunity with solutions that fit your needs.

This document is non-contractual. Constant improvement and engineering progress make it necessary that we reserve the right to make specification, equipment, and price changes without notice. Illustrations shown may include optional equipment and accessories and may not include all standard equipment.