MX200/150/250 Controllers Overview
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2. MX250 Factory Options
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9. CODEC Software for FAS
10. Frequently Asked Questions (FAQ)
1. Introduction

- Have I/Os option
- Lonwork/Modbus
- Commercial /Critical Applications
- Std/Delay/Closed Transition ATS
2. MX250 Factory Options

1. Phase Rotation Mismatch / Phase Sequence Mismatch
2. In-Phase Monitor (R50)
3. Voltage Imbalance
4. Universal Motor Disconnect (UMD)
5. Elevator Pre-Signals (W3/T3)
6. Over Voltage, Over Frequency, Under Frequency
7. CTAP
8. Network – LonWork or Modbus
3. **Phase Rotation Mismatch**

- Only applies to 3-Phase system
- Phase Rotation MisMatch –
  - Only applies to both S1 and S2 having 3 phases
- Clockwise Rotation (CW) –
  - A->B->C,  B->C->A,  C->A->B
- Counter Clockwise Rotation (CCW) –
  - B->A->C,  A->C->B,  C->B->A
4. In-Phase Monitor (R50) Operation

R50 Calculation for 60Hz condition:

In terms of time interval –

\[360^{\circ} = 16.67\text{ms}\]

\[1^{\circ} = (16.67 \div 360)\text{ms}\]

\[1^{\circ} = 0.0463\text{ms} \text{ (or 46.3}\mu\text{ms)}\]

\[7^{\circ} = (46.3 \times 7)\mu\text{ms} = 324.1\mu\text{ms}\]

Suppose \(\Delta t = 250\mu\text{ms},\)

Then, \(\text{Degree} = 250/46.3 = 5.4\)

R50 Calculation for 50Hz condition:

In terms of time interval –

\[360^{\circ} = 20\text{ms}\]

\[1^{\circ} = (20 \div 360)\text{ms}\]

\[1^{\circ} = 0.0555\text{ms} \text{ (or 55.5}\mu\text{ms)}\]

\[7^{\circ} = (55.5 \times 7)\mu\text{ms} = 388.5\mu\text{ms}\]

Suppose \(\Delta t = 250\mu\text{ms},\)

Then, \(\text{Degree} = 250/55.5 = 4.5\)
5. Timers Sequence

1a. For Standard Transition ATS

<table>
<thead>
<tr>
<th>ATS POSITION</th>
<th>S1</th>
<th>S2</th>
<th>S1</th>
</tr>
</thead>
<tbody>
<tr>
<td>X'FER</td>
<td>C</td>
<td>C</td>
<td>CCN</td>
</tr>
<tr>
<td>State No.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>S1 Status</td>
<td>Red</td>
<td>Red</td>
<td></td>
</tr>
<tr>
<td>S2 Status</td>
<td>Green</td>
<td>Green</td>
<td></td>
</tr>
<tr>
<td>TIMER</td>
<td>W</td>
<td>W3</td>
<td>T</td>
</tr>
<tr>
<td>Options</td>
<td>Pre-UMD</td>
<td>Pre-UMD</td>
<td>Post-UMD</td>
</tr>
</tbody>
</table>

**Legend**
- Red: Not Available
- Green: Available
- Transfer in Process
- Waiting S2 ready
- Waiting S1 ready
- NA

**Fig 1a When S1 fails**

- P: Time Delay to S2 Start
- W: Time Delay to S2 Stable
- T: Time Delay retransfer to S1
- U: Time Delay to S2 Stop
- W3: Elevator Pre-Signal @ S1
- T3: Elevator Pre-Signal @ S2
- UMD: Universal Motor Disconnect timer
5. Timers Sequence

1b. For Standard Transition ATS

Sequence of operation

<table>
<thead>
<tr>
<th>ATS POSITION</th>
<th>S1</th>
<th>C</th>
<th>E</th>
<th>S2</th>
<th>C</th>
<th>N</th>
<th>S1</th>
</tr>
</thead>
<tbody>
<tr>
<td>XFER</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>State No:</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>S1 Status</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S2 Status</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TIMER</th>
<th>W</th>
<th>R50</th>
<th>T</th>
<th>T3</th>
<th>R50</th>
<th>U</th>
</tr>
</thead>
<tbody>
<tr>
<td>Options</td>
<td>Pre-UMD</td>
<td>Post-UMD</td>
<td>Pre-UMD</td>
<td>Post-UMD</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Fig 1b When load test is initiated

Note:
1) Load test initiated @ State #1.
2) Load test cancelled @ State #9.

Legend:
- Not Available
- Available
- Transfer in Progress
- Waiting S1 ready
- Waiting S1 ready
- N/A

P: Time Delay to S2 Start
W: Time Delay to S2 Stable
T: Time Delay retransfer to S1
U: Time Delay to S2 Stop
W3: Elevator Pre-Signal @ S1
T3: Elevator Pre-Signal @ S2
UMD: Universal Motor Disconnect timer
5. Timers Sequence

Parallel Timers Operation

1. \( W3/T3 = UMD \)
   - \( W3/T3 \)
   - \( UMD \)

2. \( W3/T3 > UMD \)
   - \( W3/T3 \)
   - \( UMD \)
   - \( R50 \)
   - \( Xfer \)

3. \( W3/T3 < UMD \)
   - \( W3/T3 \)
   - \( UMD \)
5. Timers Sequence

2a. For Delay Transition ATS

<table>
<thead>
<tr>
<th>ATS POSITION</th>
<th>X FER</th>
<th>S1</th>
<th>Open</th>
<th>S2</th>
<th>Open</th>
<th>S1</th>
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<tbody>
<tr>
<td>State No.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
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<tr>
<td>S1 Status</td>
<td>R</td>
<td>R</td>
<td>C</td>
<td>O</td>
<td>C</td>
<td>O</td>
</tr>
<tr>
<td>S2 Status</td>
<td>R</td>
<td>R</td>
<td>C</td>
<td>O</td>
<td>C</td>
<td>O</td>
</tr>
<tr>
<td>TIMER</td>
<td>P</td>
<td>W</td>
<td>DW</td>
<td>W3</td>
<td>T</td>
<td>DT</td>
</tr>
<tr>
<td>Options</td>
<td>UMD</td>
<td>Pre-UMD</td>
<td>Post-UMD</td>
<td>Pre-UMD</td>
<td>Post-UMD</td>
<td></td>
</tr>
</tbody>
</table>

Fig 2a When S1 fails

Legend:
- C: Available
- O: Transfer in Process
- Not Available
- Waiting S1 ready
- Waiting S2 ready
- NA

P: Time Delay to S2 Start
W: Time Delay to S2 Stable
T: Time Delay retransfer to S1
U: Time Delay to S2 Stop
DW: Time Delay from OPEN to S2
DT: Time Delay from OPEN to S1
W3: Elevator Pre-Signal @ S1
T3: Elevator Pre-Signal @ S2
UMD: Universal Motor Disconnect timer

Attention: Delay transition ATS does not require R50
5. Timers Sequence

2b. For Delay Transition ATS

Sequence of operation

<table>
<thead>
<tr>
<th>X'FER</th>
<th>S1</th>
<th>Open</th>
<th>S2</th>
<th>Open</th>
<th>S1</th>
</tr>
</thead>
<tbody>
<tr>
<td>State No.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>S1 Status</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S2 Status</td>
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<td></td>
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</tr>
<tr>
<td>TIMER</td>
<td>Options</td>
<td>F</td>
<td>W</td>
<td>DW</td>
<td>Pre-UMD</td>
</tr>
</tbody>
</table>

Fig 2b When load test is initiated

Note:
1) Load test initiated @ State #1
2) Load test cancelled @ State #10.

Legend:
- Red: Not Available
- Green: Available
- Yellow: Transfer in Process
- Orange: Waiting S1 ready
- Black: Waiting S2 ready
- N/A: Not Applicable

Attention: Delay transition ATS does not require R50

P: Time Delay to S2 Start
W: Time Delay to S2 Stable
T: Time Delay retransfer to S1
U: Time Delay to S2 Stop
DW: Time Delay from OPEN to S2
DT: Time Delay from OPEN to S1
W3: Elevator Pre-Signal @ S1
T3: Elevator Pre-Signal @ S2
UMD: Universal Motor Disconnect timer
5. Timers Sequence

For Closed Transition ATS

Sequence of operation

<table>
<thead>
<tr>
<th>Timer Position</th>
<th>S1</th>
<th>Open</th>
<th>S2</th>
<th>S1, S2</th>
<th>S1</th>
</tr>
</thead>
<tbody>
<tr>
<td>XFER</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>S1 Status</td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>S2 Status</td>
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</tr>
<tr>
<td>Timer Options</td>
<td>P</td>
<td>W</td>
<td>DW</td>
<td>T</td>
<td>T3</td>
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</tr>
<tr>
<td>Options</td>
<td>Pre-UMD</td>
<td>Post-UMD</td>
<td>Pre-UMD</td>
<td>Post-UMD</td>
<td>Pre-UMD</td>
</tr>
</tbody>
</table>

Legend:
- Red: Not Available
- Green: Available
- Yellow: Transfer in process
- Blue: Waiting S2 ready
- Purple: Waiting S1 ready
- Black: N/A

Fig 3a: Closed-Transition ATS behaves as Open-Transition when S1 fails

- P: Time Delay to S2 Start
- W: Time Delay to S2 Stable
- T: Time Delay retransfer to S1
- U: Time Delay to S2 Stop
- DW: Time Delay from OPEN to S2
- DT: Time Delay from OPEN to S1
- W3: Elevator Pre-Signal @ S1
- T3: Elevator Pre-Signal @ S2
- UMD: Universal Motor Disconnect timer
5. Timers Sequence

For Closed Transition ATS

Sequence of operation

<table>
<thead>
<tr>
<th>ATS POSITION</th>
<th>S1</th>
<th>S2</th>
<th>S1</th>
<th>S2</th>
</tr>
</thead>
<tbody>
<tr>
<td>X/FER</td>
<td>C</td>
<td>C</td>
<td>C</td>
<td>C</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>State No.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
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<tr>
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<tr>
<td>S2 Status</td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TIMER</th>
<th>P</th>
<th>W</th>
<th>W3</th>
<th>R50</th>
<th>T</th>
<th>T3</th>
<th>R50</th>
<th>U</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre-UND</td>
<td></td>
<td></td>
<td></td>
<td>Post-UND</td>
<td></td>
<td></td>
<td>Post-UND</td>
</tr>
</tbody>
</table>

Note: 1) Load test initiated @ State #1 2) Load test cancelled @ State #10.

Legend:
- Red: Not Available
- Green: Available
- Yellow: Transfer in Process
- Grey: Waiting S2 ready
- Black: Waiting S1 ready
- NA

P: Time Delay to S2 Start
W: Time Delay to S2 Stable
T: Time Delay retransfer to S1
U: Time Delay to S2 Stop
DW: Time Delay from OPEN to S2
DT: Time Delay from OPEN to S1
W3: Elevator Pre-Signal @ S1
T3: Elevator Pre-Signal @ S2
UMD: Universal Motor Disconnect timer
6. MX250 Inputs

Hardware inputs:

1. Q2/TSL (Test-Switch-Load)
2. TSNL (Test-Switch-No-Load)
3. Q3 (Inhibit Transfer to S2 source)
4. Q7 (Inhibit Re-transfer to S1 source)
5. S5 (Auto or Manual Retransfer to S1 source)
6. S12 (Auto or Manual Retransfer to S1 and S2 sources)
7. LS (Load shed)
8. TMS (Closed Transition mode)
9. YN (Bypass T-timer)
10. YE (Bypass W-timer)
11. ATR (Automatic Transfer Relay)
7. MX250 Outputs

Hardware Outputs:
1. LN (Open)
2. L1 (EP)
3. L3 (NA)
4. NIA (Not In Auto)
5. CTAP (Alarm)
6. UMD A62 (Universal Motor Disconnect)
7. L4 (EA)
8. L2 (NP)
9. LS (Load Shed)
10. T3/W3 (Elevator Pre-Signal)
11. STE (Shunt Trip Emergency)
8. Factory Configuration

MX150/250 Factory Configuration Software (50P-1163)

Click “Manual Configuration” to proceed
8. Factory Configuration

MX150/250 Factory Configuration Software (50P-1163)

MX200/150/250 GEZC Service School

1. Connect TD(A) of 50W-1208 to Pin 2 (socket J4) of MX150/250 Controller via PS5133.
2. Connect TD(B) of 50W-1208 to Pin 1 (socket J4) of MX150/250 Controller via PS5133.

Belden Twisted Pair cable: WMW-453
Programming plug: 50W-1211
RS232-to-485 Converter: 50W-1208

Supporting accessory:
One Port USB-232 converter (with GEZC’s part number: 50W-1223 or NI part number: 778472-01) shall be used.

For information about the USB converter, visit --
8. Factory Configuration

MX150/250 Factory Configuration Software (50P-1163)
8. Factory Configuration

MX150/250 Factory Configuration Software (50P-1163)
8. Factory Configuration

MX150/250 Factory Configuration Software (50P-1163)

![Factory Configuration Software](image)

- **P Timer (s)**: 3
- **W Timer (s)**: 1
- **T Timer (s)**: 1800
- **U Timer (s)**: 180
- **DT Timer (s)**: 5
- **DW Timer (s)**: 5
- **T3/W3 Timer (s)**: 20
- **UMD Timer (s)**: 5
- **Volt Imb TimeOut (s)**: 10

**MX200/150/250**  
GEZC Service School
8. Factory Configuration

MX150/250 Factory Configuration Software (50P-1163)
8. Factory Configuration

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MX150/250 Factory Configuration Software (50P-1163)
9. CODEC Software

MX150/250 CODEC Software (50P-1167)
9. CODEC Software

MX150/250 CODEC Software (50P-1167)
10. Q&A

- Exerciser
- Timer Configuration
- Threshold Fail and Restore levels
- Phase Rotation
- New DST
- FAS