DXMR50 Logic Blocks

Logic That Runs In The Field

- Run logic and arithmetic functions like AND, OR, counting, on-delay, scaling, and more—without the cost and complexity of a PLC
- Configure logic easily using free configuration software—no expertise required
- Simplify deployment with nine model variants that combine discrete, analog (0–10 V DC or 4–20 mA), and Modbus to match I/O requirements
- Install in the field—IP67/IP68-rated sealed compact housing needs no enclosure, DIN rail, or panel wiring
- Diagnose issues quickly and mount in either direction with onboard LEDs on both sides that show input/output and power status

BANNER®

DXMR50 Discrete and Analog Input Models

	DXMR50-LB-2PA-**2P**	DXMR50-LB-2PA-**PI**	DXMR50-LB-2PA-**PU**
Port 0/Power	Pin 1 and 3: Power RTU Server for configuration and register access		
Input Port 1 **Input Port 2**	Pin 1 and 3: Power Pin 2: Analog (selectable 0–10 V DC or 4–20 mA) Pin 4: Discrete PNP		
Output Port	Pin 2: Discrete PNP Pin 4: Discrete PNP	Pin 2: Analog (4–20 mA) Pin 4: Discrete PNP	Pin 2: Analog (0–10 V DC) Pin 4: Discrete PNP

Easily Deployable Jam Indication

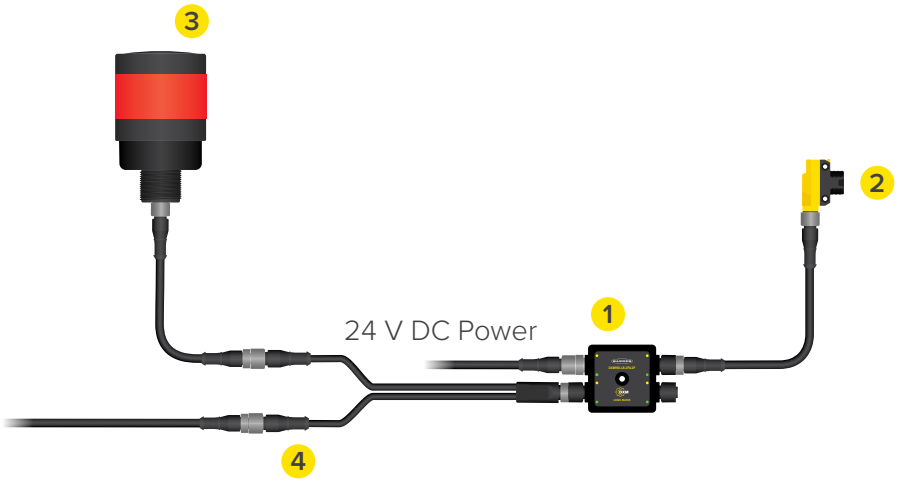
Challenge

Package flow is already monitored by a sensor connected to a PLC but there is no local indication to show operators when a jam occurs, and adding indication requires PLC logic updates and additional control wiring.

Solution

A DXMR50-LB-2PA-2P Logic Block is inserted into the existing monitoring solution, connecting a QS18 discrete PNP sensor and a red TL70 Tower Light using only a splitter and two short, double-ended cordsets. When the sensor on Input 1 detects a package, the Logic Block copies the output value to a register, forwarding it to the PLC on Output Pin 4 while leaving the existing monitoring solution undisturbed. At the same time, the Logic Block starts a 5000 ms timer, delaying the signal on Output Pin 2. If the output signal remains high for greater than 5000 ms, then the output passes to Output Pin 2, switching the red TL70 Tower Light ON. If the sensor's output signal is low before the time limit, then the timer resets and the TL70 Tower Light remains OFF, ensuring personnel are only alerted when their attention is needed.

Jam Detection Topology

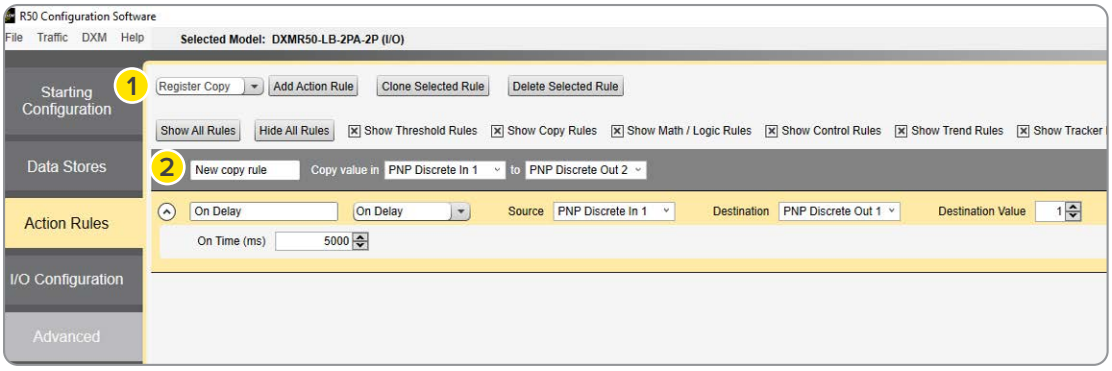


1. DXMR50-LB-2PA-2P
2. QS18K6AF250Q8
3. TL70RQ
4. S15YB-M124-M124-0.2M

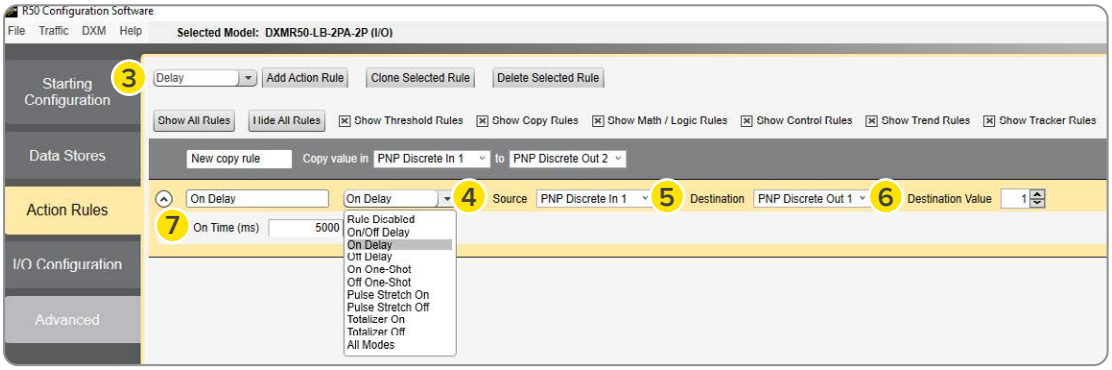
Scan to Learn More About How To Set Up This Logic

Logic Setup for Time-Based Indication

The DXMR50 receives a PNP signal from a QS18 Sensor on Input Port 1. When the input is high, the signal is copied to Output 2 (Pin 4) for the PLC and a five-second timer starts. If the signal remains high for five seconds, the DXMR50 sets Output 1 (Pin 2) high, switching the red TL70 Tower Light ON. If the sensor output goes low before five seconds, the timer resets and Output 1 stays low, leaving the TL70 Tower Light OFF.



1. **Set Action Rule** to Register Copy.
2. Set up Register Copy rule to **copy value** in from PNP Discrete In 1 register to PNP Discrete Out 2 register.



3. **Add Delay** action rule and select On Delay.
4. **Set Source** to PNP Discrete In 1.
5. **Set Destination** to PNP Discrete Out 1.
6. **Set Destination Value** to 1.
7. **Set On Time** to 5000 ms.

DXMR50 Modbus Input Models

	DXMR50-LB-2M-**2P**	DXMR50-LB-2M-**PI**	DXMR50-LB-2M-**PU**
Port 0/Power	Pin 1 and 3: Power RTU Server for configuration and register access		
Input Port 1 **Input Port 2**	Pin 1 and 3: Power Pin 2: Modbus RS-485 (+) Pin 4: Modbus RS-485 (-)		
Output Port	Pin 2: Discrete PNP Pin 4: Discrete PNP	Pin 2: Analog (4–20 mA) Pin 4: Discrete PNP	Pin 2: Analog (0–10 V DC) Pin 4: Discrete PNP

Conditional Indication for Machine Monitoring

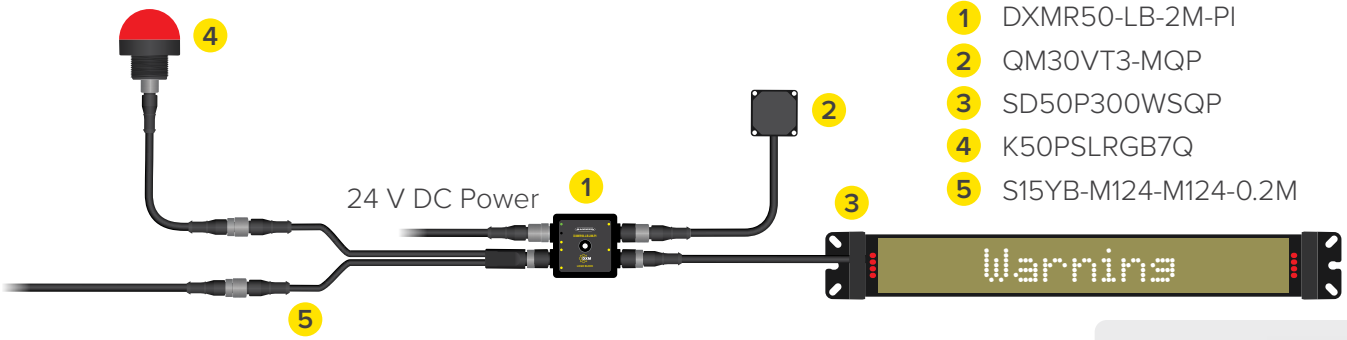
Challenge

A critical machine needs a dedicated monitoring and alerting system that provides local vibration and temperature readings along with clear indication when conditions rise toward levels that could disrupt operation.

Solution

A DXMR50-LB-2M-PI Logic Block provides threshold logic and value scaling for monitoring and localized indication. The Logic Block reads vibration data and VIBE-IQ warning and alarm flags from a QM30VT3 3-Axis Vibration Sensor on Input 1 and writes Modbus register values to an SD50 Status Display over Modbus on Input 2, providing operators with at-a-glance vibration values and warning/alarm text. A splitter on the Output connects to a PLC and to a K50 Programmable Indicator. The Logic Block scales the vibration and temperature registers from the QM30VT3 into a 4–20 mA analog signal on Output (Pin 2) for the PLC to drive proportional actuators, and when its user-configured 5000 Hz Z-Velocity threshold is reached, it writes the “WARNING” text to the SD50 and sets the PNP alarm on the Output (Pin 4) to switch the K50 to red.

Motor Monitoring Topology



1. DXMR50-LB-2M-PI
2. QM30VT3-MQP
3. SD50P300WSQP
4. K50PSLRGB7Q
5. S15YB-M124-M124-0.2M

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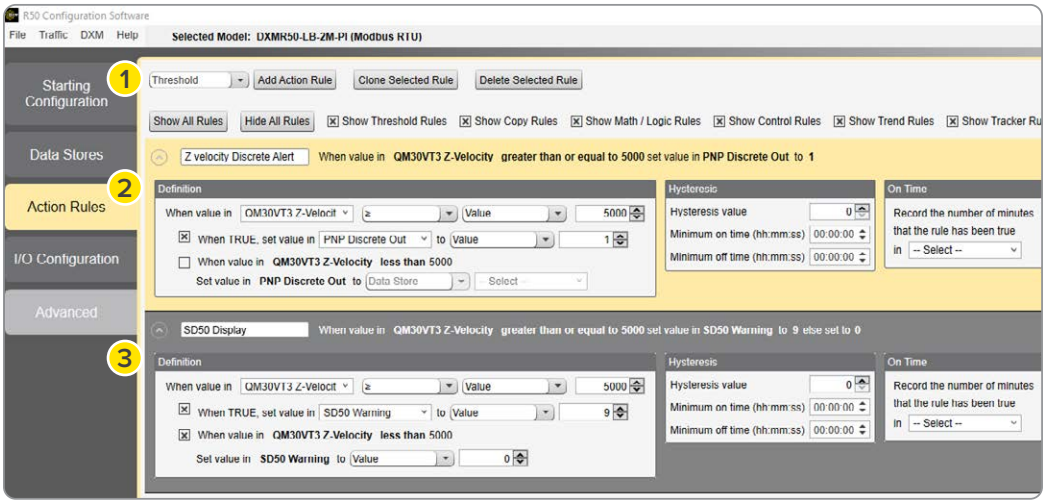
Logic Setup for Threshold-Based Indication

The DXMR50 reads the Z-Velocity value from the QM30VT3 Sensor on Input Port 1. When the value is greater than or equal to five thousand hertz, the DXMR50 sets the SD50 Status Display on Input Port 2 to show “Warning” and sets the K50 Indicator to red. A splitter on Output Port 3 allows the signal to pass through to both the PLC and the K50 Indicator so that monitoring continues without interruption.



1. **Set Action Rule** to Threshold.
2. **Define rule** for input threshold value so that if QM30VT3 Z-Velocity input is greater than or equal to 5000 Hz, then PNP Discrete Out (Pin 4) value is set to 1, changing the K50 Indicator from green to red.
3. **Define threshold** value in rule so that if QM30VT3 Z-Velocity input is greater than or equal to 5000 Hz, then SD50 Warning value is set to 9, and if input is less than 5000 Hz, then SD50 Warning value is set to 0.
4. **Add Read Rule** for QM30VT3 Z-Velocity on Input Port 2.
5. **Add Write Rule** for SD50 Display Warning on Input Port 1.

DXMR50 Modbus, Discrete, and Analog Input Models

	DXMR50-LB-MPA-**2P**	DXMR50-LB-MPA-**PI**	DXMR50-LB-MPA-**PU**
Port 0/Power	Pin 1 and 3: Power RTU Server for configuration and register access		
Input Port 1	Pin 1 and 3: Power Pin 2: Modbus RS-485 (+) Pin 4: Modbus RS-485 (-)		
Input Port 2	Pin 1 and 3: Power Pin 2: Analog (selectable 0–10 V DC or 4–20 mA) Pin 4: Discrete PNP		
Output Port	Pin 2: Discrete PNP Pin 4: Discrete PNP	Pin 2: Analog (4–20 mA) Pin 4: Discrete PNP	Pin 2: Analog (0–10 V DC) Pin 4: Discrete PNP

Input Scaling for Live Tank Level Indication

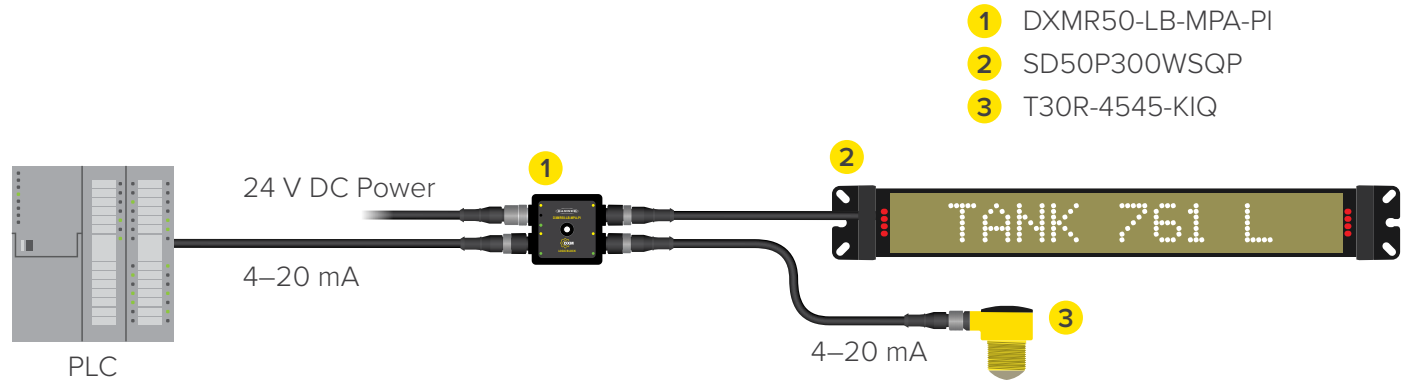
Challenge

Tank level is already monitored by an analog sensor tied into a PLC, but there is no way for operators to visualize level directly at the tank.

Solution

A DXMR50-LB-MPA-PI Logic Block takes the analog signal representing the tank level from a T30R sensor on Input 2. The Logic Block scales the value and writes it to an SD50 Status Display over Modbus on Input 1. Set to Measure Mode, the SD50 displays the tank level with LED fill, text, and color indication. At the same time, the Logic Block recasts the analog signal on its Output back to the PLC, ensuring the existing monitoring system remains unchanged.

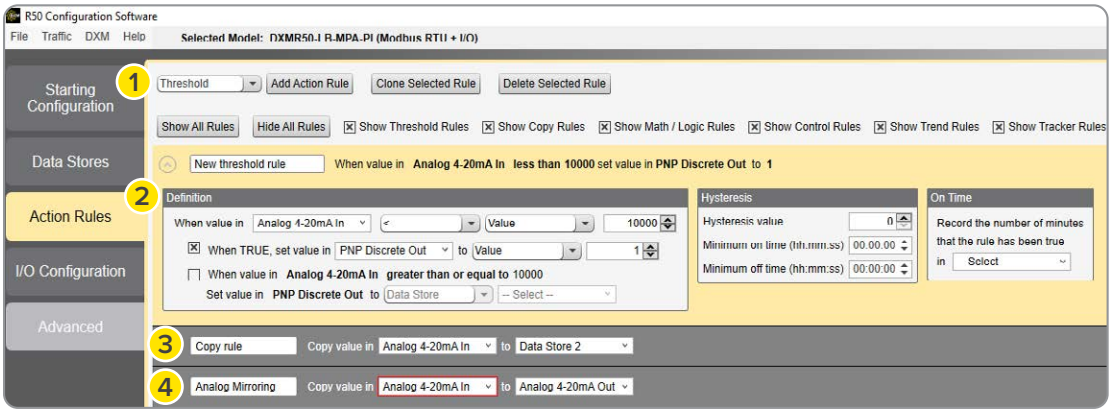
Tank Level Topology

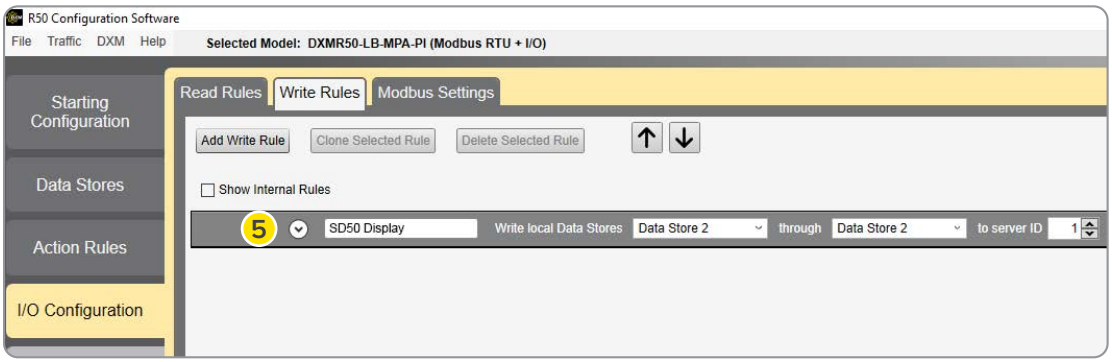


Scan to Learn More About How To Set Up This Logic

Logic Setup for Analog Scaling and Indication

The DXMR50 receives a 4–20 mA signal from a T30R Sensor on Input Port 2. When the signal drops below a defined threshold, the DXMR50 sets the discrete output on Output Port 3 high to signal a low-level condition to the PLC. At the same time, the DXMR50 copies the analog input signal to the analog output on Output Port so the PLC continues to receive the tank level as a 4–20 mA value, while also writing the scaled level over Modbus from Input Port 1 to an SD50 Status Display for local visual indication.





1. **Set Action Rule** to Threshold.
2. **Define rule** for input threshold value so that if Analog 4-20 mA In is less than 10000, then PNP Discrete Out is set to 1.
3. **Add Copy Rule** to copy Analog 4-20 mA input data from analog sensor to data store register.
4. **Add Copy Rule** to write Analog 4-20 mA input data from analog sensor to Analog 4-20 mA output.
5. **Add Write Rule** to write data store registers copied from Analog 4-20 mA input to the SD50 Display.

DXMR50 Logic Blocks

Series	Style		Inputs		Outputs
DXMR50	– **LB**	–	**MPA**	–	**PI**

LB = Logic block

2PA = Input Port 1 and 2:
Pin 2: Analog (selectable 0–10 V DC or 4–20 mA)
Pin 4: Discrete PNP

2M = Input Port 1 and 2: Modbus RS-485

MPA = Input Port 1: Modbus RS-485
Input Port 2: Discrete PNP and Analog (selectable 0–10 V DC or 4–20 mA)

2P = Pin 2: Discrete PNP, Pin 4: Discrete PNP
PI = Pin 2: Analog (4–20 mA), Pin 4: Discrete PNP
PU = Pin 2: Analog (0–10 V DC), Pin 4: Discrete PNP

Specifications

Supply Voltage	12 to 30 V DC
Construction	PVC
Operating Conditions	–40 to +80 °C
Environmental Rating	IP65, IP67
Certifications	CE, cULus LISTED

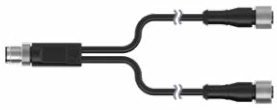
Accessories

BWA-M12CAB-MAG
Magnetic Bracket for M12 Cables

SMBR50
R50 Mounting Bracket

4-Pin M12 Double-Ended
Straight connector models; for right-angle models, add **A** to the end of **M12F4** (example, BC-M12F4A-M12M4-22-2)

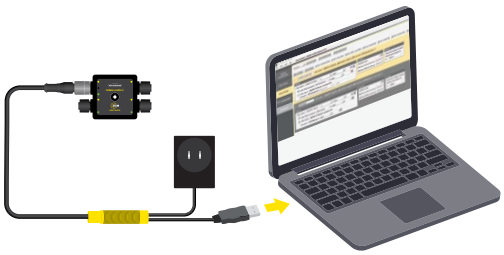
BC-M12F4-M12M4-22-2
2 m (6.5 ft)
BC-M12F4-M12M4-22-5
5 m (16.4 ft)
BC-M12F4-M12M4-22-10
10 m (32.8 ft)



4-Pin M12 Splitter
Male trunk with female branches

S15YB-M124-M124-0.2M
0.2 m (0.65 ft)

Programming



BWA-UCT-900
A single programming cable provides everything you need to configure the DXMR50 Logic Blocks.

DXMR50-LB Configuration Software
Free configuration software that makes it easy to create control logic using AND, OR, XOR, flip-flops, thresholds, timing, and much more to automate actions and outputs.

Banner Engineering Corp.
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