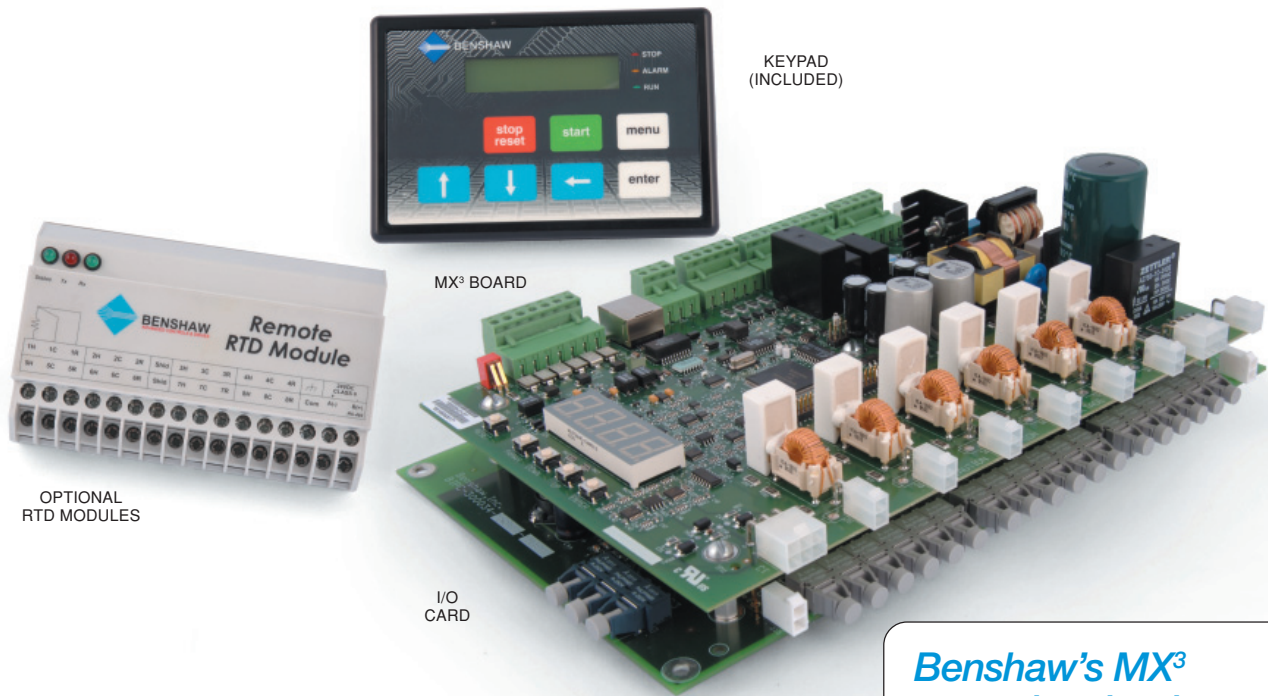


# New MX<sup>3</sup> Control Technology

NEXT GENERATION INTELLIGENT MOTOR CONTROL



## MX<sup>3</sup> Control Highlights

Benschaw's next generation MX<sup>3</sup> technology propels low voltage motor control to even greater levels of performance and functionality. With its real-time clock, enhanced programming capabilities, ease of use, and a unique, flexible architecture—Benschaw's MX<sup>3</sup> controller delivers advanced motor control and protection with all of the rugged, dependable performance you've come to expect from the world leader in advanced controls and drives.

MX<sup>3</sup> controllers, power components, software and sensors are all designed, built and tested to perform as an integrated control system, eliminating the coordination and performance problems inherent in other forms of reduced voltage starting.

With more built-in features, more configurable options, greater expandability and a broader communications capability than any other motor control on the market, Benschaw's next generation MX<sup>3</sup> technology will shorten your commissioning times, improve motor performance and protection, enhance diagnostic capability and streamline electrical system monitoring and maintenance tasks.

### *Benschaw's MX<sup>3</sup> control technology provides all MX<sup>2</sup> features, plus:*

- ◆ 8 user configurable inputs
- ◆ 2 fixed inputs for start and bypass confirm
- ◆ 6 user configurable relay outputs
- ◆ 1 fixed output for bypass confirm
- ◆ Real-time clock
- ◆ Motor PTC input
- ◆ Zero Sequence Ground Fault
- ◆ RTD module support
- ◆ Full DC braking with add-on SCR
- ◆ Event log (99 events)
- ◆ Start per hour limiter
- ◆ Back spin timer
- ◆ Time between starts limiter
- ◆ Zero speed switch input
- ◆ Power outage ride through (PORT)
- ◆ Power factor trip
- ◆ Patented CYCLO control (0-40% speed)

# MX<sup>3</sup> Control Features

## Multiple Starting Modes:

- ◆ Voltage ramp
- ◆ Current ramp
  - Adjustable initial current
  - Adjustable maximum current
  - Adjustable ramp time
- ◆ Torque ramp (True Torque)
  - Adjustable initial torque
  - Adjustable maximum torque
  - Adjustable ramp time
- ◆ Power ramp
  - Adjustable initial torque
  - Adjustable maximum torque
  - Adjustable ramp time
- ◆ Linear/tach feedback control
- ◆ CYCLO converter control

## Motor Protection:

- ◆ Motor thermal overload
- ◆ Independent starting and running OL's
- ◆ Up to speed timer exceeded
- ◆ Low line voltage
- ◆ Low line frequency
- ◆ High line frequency
- ◆ Phase reversal
- ◆ Phase loss
- ◆ Instantaneous overcurrent
- ◆ Overcurrent
- ◆ Undercurrent
- ◆ Current imbalance
- ◆ Ground fault (residual or zero sequence)
- ◆ Shorted SCR
- ◆ Disconnect fault
- ◆ Inline contactor fault
- ◆ Control power low
- ◆ Stack over temperature
- ◆ Motor PTC input
- ◆ RTD modules

## Metering:

- ◆ +/- 2% accuracy
- ◆ Average current
- ◆ L1 current
- ◆ L2 current
- ◆ L3 current
- ◆ Current imbalance %
- ◆ Ground fault amps/residual
- ◆ Average volts

## Metering, continued:

- ◆ L1 - L2 voltage
- ◆ L2 - L3 voltage
- ◆ L3 - L1 voltage
- ◆ Overload %
- ◆ Power factor
- ◆ Watts
- ◆ VA
- ◆ VARS
- ◆ KW hours
- ◆ MW hours
- ◆ Phase order
- ◆ Line frequency
- ◆ Analog input
- ◆ Analog output
- ◆ Run time - days
- ◆ Run time - hours
- ◆ # of starts
- ◆ Tru Torque %
- ◆ Power %
- ◆ Peak starting current
- ◆ Last starting duration
- ◆ Real-time clock

## 8 Digital Inputs Configurable to:

- ◆ Stop
- ◆ Fault
- ◆ Fault reset
- ◆ Bypass/confirmation & inline
- ◆ OL reset
- ◆ Local/remote selection
- ◆ Heater enable
- ◆ Heater disable
- ◆ Dual ramp selection
- ◆ 1 dedicated start input
- ◆ 1 dedicated bypass

## 6 Relay Outputs Configurable to:

- ◆ Starter off
- ◆ Faulted fail safe and non fail safe
- ◆ Running
- ◆ Up to speed
- ◆ Alarm condition
- ◆ Ready condition
- ◆ Locked out
- ◆ Over current trip
- ◆ Under current trip
- ◆ OL alarm
- ◆ Shunt trip fail safe and non fail safe
- ◆ Ground fault

## Relay Outputs, continued:

- ◆ Energy saver indication
- ◆ Heating indication
- ◆ Slow speed forward/reverse
- ◆ DC braking
- ◆ Cooling fan
- ◆ 1 fixed bypass

## 1 Analog 4-20mA / 0-10Vdc Input Configurable to:

- ◆ Trip high level
- ◆ Trip low level

## 1 Analog 4-20mA / 0-10Vdc Output Configurable to:

- ◆ Current (0-200%/0-800%)
- ◆ Voltage (0-150%)
- ◆ OL (0-150%)
- ◆ KW (0-10 Kw/0-100 Kw)
- ◆ MW (0-1 Mw)
- ◆ Analog input (0-100%)
- ◆ Firing (0-100%)
- ◆ Calibration

## User Interface:

- ◆ Standard board-mounted LED interface
- ◆ Optional remote mount LCD display
  - Set/examine operating parameters
  - View status information
  - View line current, voltage and frequency in real time
  - Start and stop the solid state starter

## 1 Communication Port:

- ◆ ModBus
- ◆ RS485

## Advanced Functionality:

- ◆ Dual ramp selection
- ◆ Adjustable kick current
- ◆ Programmable decel modes
- ◆ LV BIST test (built-in self test)
- ◆ Event log (99 events)