MIDEXX-3D

Operations Manual

Peristaltic or Positive Displacement Metering Pump Controller

WARNINGS!

Do not remove cover!

Operators should never attempt to service the components inside the unit. To avoid electric shock refer servicing to qualified personnel!

Failure to follow the correct cable connection procedure will result in damage to the circuit board, and voids the warranty!

Please check the labels on the Midexx unit and read the manual before connecting any cables!

Avoid electrostatic discharge! The devices are equipped with electronic components that you may destroy by electrostatic discharge when you touch. Pay attention while handling the devices to good grounding of the environment (persons, job and packing).

Every conceivable measure has been taken to ensure the accuracy and completeness of this documentation. However, as errors can never be fully excluded, we always appreciate any information or suggestions for improving the documentation.

Table of Contents

Introduction and features

MIDEXX-3D is an easy to use plug and play self-contained liquid color pump system.

The motors utilizes stepper technology thus no gearbox is required which results

in weight savings on the unit and provides a couple of key advantages in operation.

Midexx-3D can pump within an accuracy range of 0.05 grams and features an injection recovery time as fast as 0.5 seconds. It also includes a refill pump which maintains the level of additive in the reservoir.

The enclosure is made of heavy duty anodized aluminum. The metal coupling connects different types of pump heads to the stepper motor. The four line LED display, numerical keypad and control keys combine to create a simple and user friendly interface.\

MIDEXX-3D controller consists of

1. Controller box

2. Power, Signal cables

3. USB male to male cable

4. Universal pump mounting flanges

5. Motor couplings

6. Reservoir Kit

7. Operational Manual

Accessories & Pump Heads

A variety of accessories are available with the Midexx-3D Controller as kits:

Container Holder

MID-CH is a 20 liter container holder, it enables fast color changes and limits the waste of colorant. It will accommodate both pail and bag in the box containers.
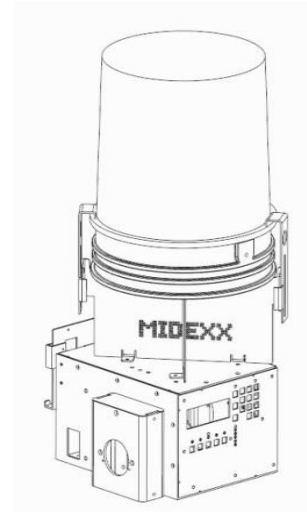
Peristaltic Pump

MID-15 is an aluminum peristaltic pump head with three stainless steel rollers, which provides high levels of strength and durability as well accuracy and precision. The hose replacement mechanism employs a quick separation structure, this allows for very quick and easy tube replacement (i.e. color changes).

We recommended MID specified tubing.

Progressive Cavity Pump

Our line of progressive cavity pumps can offer minimum flow rates as low as 0.001 L/min and maximum flow rates as high as 1.50 L/min thus ensuring feasibility for a wide spectrum of applications.

Applications can range from small-flow conveying to large flow extrusion.

Extrusion Cable

Allows the Midexx Gravimetric to be used with extrusion machines that provide outputs in the range of 0-10 V.

The front panel contains all of the switches and LED's except for the main power ON/OFF switch which is located at the back with the main power plug connection.

Power ON/OFF

Upon Power up the unit will run through a self-diagnostic routine. The first screen that comes up will contain the model, the serial number and the version of software for the unit. This first screen will last a few seconds and is followed by the operating screen indicating that the controller is ready to run.

Start/Stop

This allows the unit to begin operation. The previous information entered into the unit is assumed to be the required settings, thus once the START button is pushed the START LED will remain lit and operation will begin on those settings. The refill pump will also start if the reservoir weight is below 1.5 kg and will stop filling when it reaches 2.5Kg.

Forward/Reverse (Priming controls)

This allows the unit to be primed by manually pressing the **FORWARD** or **REVERSE** buttons. Pressing the **FORWARD** button will light up the **FORWARD LED** and the controller is programmed to run at a fixed RPM for 1 minute or until the **STOP** button is pressed. For the **REVERSE** mode the **REVERSE** button must be held.

Numerical Keypad

To enter new values the "**Up**" or "**Down**" arrows can be used to choose a value. The numeric keypad can also be used to enter a value. Upon pressing enter the value will be saved in the Midexx-3D memory. If an incorrect value is entered the "**Up**" and "**Down**" buttons can be used to retrieve the last value that was saved.

Calibrate

To have zero rejected parts on start-up press "calibrate" followed by "start" button after priming the tube. The motor will turn a few revolutions and then stop. The sample weight will be automatically shown on the screen and the unit will auto calibrate itself.

Signal

Signal cable input is typically the screw recovery signal for an injection molding machine. For extrusion applications this is a continuous power supply from the extruder that is on when the extruder is running and off when the extruder is stopped. (24-240 VAC/DC)

Tracking (Option)

This allows the unit, in extrusion mode, to follow the extrusion signal and increase or decrease speed in relation to the extruder speed. The input signal is selected when the TRACK option is activated by pressing the numeric buttons "**1**" and "**2**" simultaneously. The RPM on the screen is assumed to be the required speed. The controller is designed to accept a tracking signal of 0-10 VDC.

The tracking cable provided will attach to the option port on the MIDEXX-3D, this cable has been tagged to show the polarity of the connection to extrusion.

Indicator LEDs

The front panel consists of the following visual LED indicators:

Motor LED: When the stepper motor is running this will be lit.

Signal LED: When injection signal is detected this will be lit.

Injection LED: When the unit is operating in the Injection mode this will be lit.

Extrusion LED: When the unit is operating in the Extrusion mode this will be lit.

Error LED: When the unit is operating outside maximum or minimum speed this will be lit.
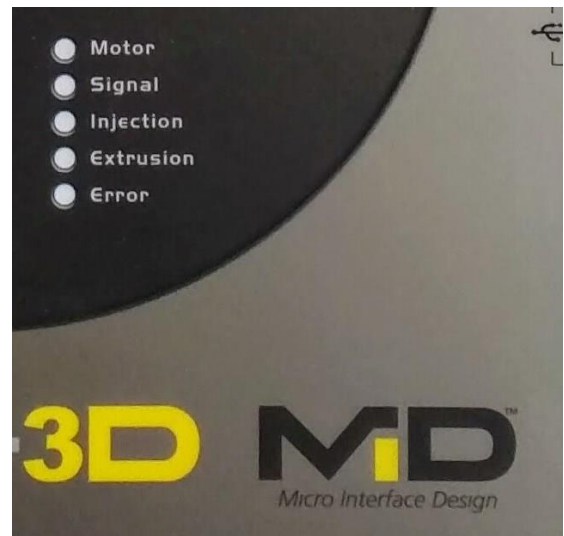
Motor Direction

In order to change the direction of the dosing motor turn the unit's main power off. Now hold the number "**3**" button and turn the main power back on. The direction of the dosing pump should now be switched.

1. Install the required pump and tubing. For peristaltic installation please secure the tube with the tube bracket as shown.

2. Ensure that the peristaltic tube assembly barb fitting is connected to the side clip (not loose) as shown.

3. Connect the signal cable to the injection or extrusion machine. (24-240 VAC/DC)

4. For injection molding the signal input is typically the screw recovery signal.

5. For extrusion applications the input signal is a continuous power supply from the extruder that

is ON when the extruder is running and OFF when the extruder is stopped.

6. Connect the Midexx to the power supply; this can be 110 VAC/220 VAC, 50/60 Hz. Refer to power input label.

7. Turn on the main power switch and the Midexx will go through a diagnostics program. Once diagnostics is complete the **STOP LED** will be lit.

8. Press the **FORWARD** key to prime the pump. Pump runs for one (1) minute at 30 rpm and then stops. Repeat operation if necessary.

9. To have zero rejected parts on start-up press "**CALIBRATE**" followed by "**START**" button after priming the tube. The motor will turn a few revolutions then stop. The sample weight will be automatically shown on the screen and the unit will auto calibrate itself.

10. To change the mode of operation between Injection or Extrusion, press and hold the "**STOP"** button during power-up. Current mode of operation will be shown on the LED indicators.

11. Enter the required data using the keypad. LDR%, Shot Size for Injection or Throughput for Extrusion mode.

12. Press the **START** key and the Midexx-3D will begin to function with the present settings.

Special Buttons on MIDEXX-3D

Special Buttons on MIDEXX-3D at POWER UP

"."	Upgrading the software (Please read Upgrading Firmware section)
"3"	Reverse the direction of the dosing motor (CW/CCW)
"6"	Setup the password (Please read Password Setup section)
"7"	Change the unit of measurement (Imperial /Metric)
"STOP"	Change the operation mode (Injection/Extrusion)
"CALIBRATION"	Scale setup (Please read the Scale Calibration section)

Running the transfer pump manually

- Ensure that the Midexx in STOP mode.

- Press "**Enter**" & "**1**" keys to run the transfer pump forward.

- Press "**Enter**" & "**3**" keys to run the transfer pump in reverse.

- Press "**Enter**" & "**2**" keys to stop the transfer pump.

Switch the transfer pump direction in start mode

- Turn Off Midexx.

- Press and hold the "**4**" key and power-up Midexx-3D.

Reset the network setting to default settings

- Press and hold "0" & "." keys for 5 seconds.

Enter boot-loader mode of WIFI Card

- Press and hold "9" & "." keys for 5 seconds.

Control Transfer Pump while in Start Mode

- Press "Enter" & "4" to toggle the transfer pump ON/OFF while filling.

Upgrading Firmware W/ USB

1. Turn off Midexx.

2. Hold the "." button & turn Midexx back on. (Nothing will show on screen it will remain blank)

3. Connect the USB cable to the PC & the Midexx.

4. The Midexx will show up on your PC as a memory stick which contains a file named "ready.txt".

5. Firmware received from MID needs to be dragged & dropped into the folder containing the "ready.txt" file.

6. Now this folder will disappear then re-appear & will be renamed "success.txt".

7. Now if you disconnect the USB cables & turn the Midexx off then on again, your Midexx-3D should be upgraded to the latest version of firmware.

Password Setup

1. Turn off Midexx.

2. Hold the "." button & turn Midexx back on.

3. Enter the admin password. For the very first time this step will be skipped.

4. Enter the new admin and user password.

5. To disable password protection set the user and admin password to 00000.

Scale Calibration For MIDEXX-3D

TARE/ZERO the scale

1. Turn off Midexx.

2. Hold the "CALIBRATE" button & turn Midexx back on (Calibrate Led blinking).

3. To Tare/Zero the scale press "CALBRATE "and "REVERSE".

4. Repeat step 3 if required until the display shows zero for weight.

5. Press "STOP" button to come out of calibration mode.

Calibrate the scale

1. Turn off Midexx.

2. Hold the "CALIBRATE" button & turn Midexx back on (Calibrate Led blinking).

3. Place a 1kg known weight on the reservoir which is on a scale.

4. Press "CALBRATE "and "FORWARD".

5. Repeat step 4 if required until the display shows 1000 for weight.

6. Press "STOP" button to come out of calibration mode.

WIFI Setup

MIDEXX RCM Quick Start
(Remote Control & Monitoring)

DO THIS FIRST.
Connect to Wifi : Midexx-XXXX
Password is located on the WiFi unit
Once connected punch this IP address into your browser. 192.168.1.3

connection is good when heart is flashing

Press to receive settings info. from the MIDEXX Pump

Get an update every five seconds.
No Changes while in Monitor Mode.

Send your changes to the MIDEXX Pump

go to the option page

MIDEXX Panel

| Retrieve | Update |
| Monitor | Options |

Communication — Comm...
Serial No. — 57017 - 2.10v
Status
Alarm
RPM — 21.7
Count — 0

Information from the MIDEXX displayed after you press Retrieve

LDR(%) — 4.000
Sample Weight(gr) — 24.0
Regrind(%) — 0.0
Product Rate(Kg/hr) — 52.0
Operation Mode

These variables you can change.
Press Update to send to MIDEXX

Pump Mode Status:
Injection or Extrusion

Extrusion

Change the Language
Sync the Time with you device.

Use this to Connect to a network or wireless Modbus TCP.
Ask for this guide.

MID-Excellence in Control
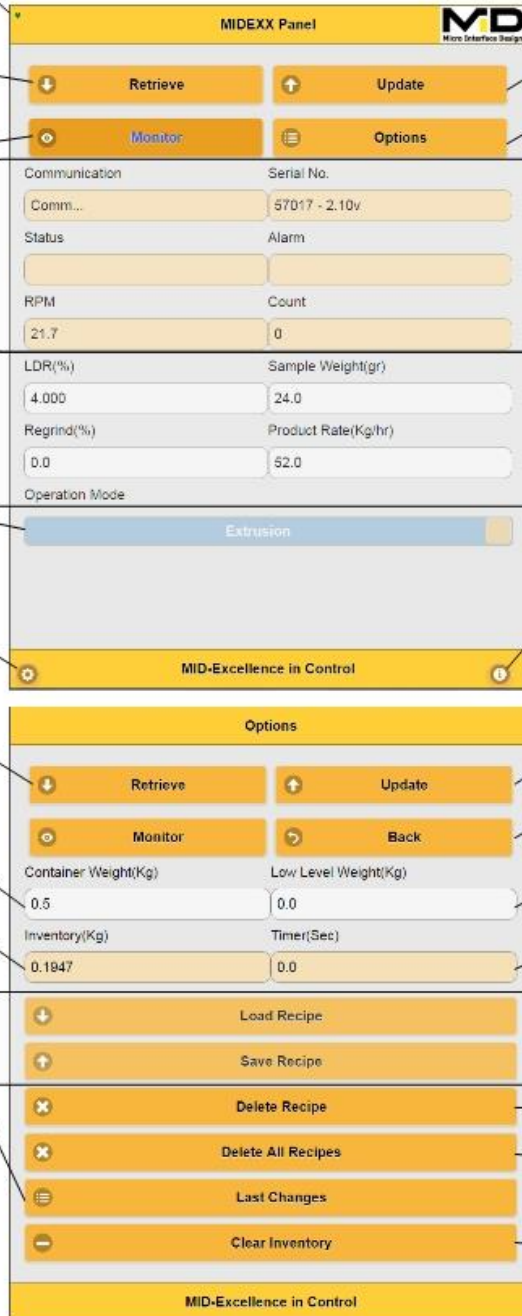
Press to receive the Settings from the MIDEXX Pump

Set the container weight

Shows amount of Inventory used since it was last cleared.

This will display the last 20 changes to
-RPM
-LDR
-Sample Weight
-Shot Size / Production Rate
It can also produce a graph that can be exported in CSV or EXCEL Format.

For real time shot to shot tracking use wireless Modbus TCP feature with your scada system or the MIDEXX Monitor software package available as an option.

Midexx WiFi Quick Start Rev 2.10

Send your changes to the MIDEXX Pump

Back to the Main page

Set when the low Level Alarm is Triggered

If you have the timer option displays the timer value

Options

| Retrieve | Update |
| Monitor | Back |

Container Weight(Kg) — 0.5
Low Level Weight(Kg) — 0.0
Inventory(Kg) — 0.1947
Timer(Sec) — 0.0

Load Recipe
Save Recipe
Delete Recipe
Delete All Recipes
Last Changes
Clear Inventory

Use these buttons to Save and Load 25 Recipes

Delete a Recipe
or
Delete them All

Clear Inventory

MID-Excellence in Control

Stack Light Alarm

• Solid Green – Normal operation

• Flashing Green – No Fill Alarm

• Flashing Amber – Low Level Alarm

• Flashing Red – NO FLOW Alarm

• Solid Amber + Solid Green – Communication Error

Low Level Alarm:

Low level alarm happens if the container weight is below the low/minimum level setting on the screen. The Alarm is a 12V DC output which could be mated to MID's MID-STL-12 or to other systems such as PLCs.

No Flow Alarm:

During operation, if the pump doses less than 70% of the expected amount for 5 consecutive dosing operations, then NO-FLOW alarm will read out on the front screen of the Midexx and 12V will be applied to the NO-FLOW alarm output. This can be used to connect an alarm light, audible sound alarm or to the plastic processing machine to enable a shutdown procedure. Five consecutive samples is a target and will require more consecutive missed doses the smaller the sample size. This is to avoid false positive errors.

Lifting and Carrying Instructions.

⚠️ Use Caution when lifting the pump it is 19kg.

Never lift the unit from the Reservoir bracket or the safety cover as it will damage the unit.

The unit should be lifted from underneath the pump brackets and placed on a cart for transport.

Cleaning and Decontamination

The Midexx-3D should be cleaned with mild detergent and a damp cloth.

Harsh chemical cleaners/solvents and excessive water should be avoided as damage may result.

Statement of Intended Use

The Midexx-3D is a metering pump with refill capabilities and is intended for metering industrial colorants and additives. Use as intended.

Equipment maintenance and Service

Basic Maintenance for your Midexx-3D

- Keep the unit Clean.
- Inspect hoses and pumps weekly for leaks and wear.
- Inspect cable connections weekly.
- Calibrate the scale annually (see manual)
- Reservoirs and tube kits are available from MID or your Distributor.

We service and support everything that we sell.

Technical Support Phone: 1-905-947-1114

E-Mail: support@microinterfacedesign.com

Website: www.microinterfacedesign.com

Troubleshooting/ Error Codes

1. If the required speed exceeds the maximum capability of the stepper motor then the ERROR LED will flash rapidly on the unit. In Com Pacer software a descriptive (Speed HI) error message will be displayed on the Monitor screen. The unit will continue to operate at its maximum output. Please correct by adjusting the tubing and/or parameters.

2. If the required speed is less than the minimum capability of the stepper motor then the ERROR LED will flash slowly on the unit. The unit will continue to operate at its minimum output. Please correct by adjusting the tubing and/or parameters.

3. If the internal self-diagnostics have failed during power up then the ERROR LED will continue to flash.

Midexx-3D Connection to Injection and Extrusion Machines

Connect Midexx-3D to an Injection Molding Machine.

To Connect a Midexx-3D to an Injection Molding Machine for synchronization a screw recover signal is required. Molding machines provide this signal in one of the following formats.

- 12V to 24VAC/DC Signal

- 120-240VAC signal

- Relay contact closure (Dry Contact).

The Midexx-3D has been designed to accept this screw recovery signal as a voltage form 24-240VAC/DC from the "SIGNAL INPUT" or as a contact closure (Dry Contact) from the

AUX Port INPUT with and Auxiliary Port Adapter Cable.

Connection with a live signal from the Signal Port. (24-240 V AC/DC)


On the Midexx-3D the Signal 24-240 VAC Signal is available on the rear panel of the Midexx-3D and the connection is a standard IEC Receptacle.

Signal

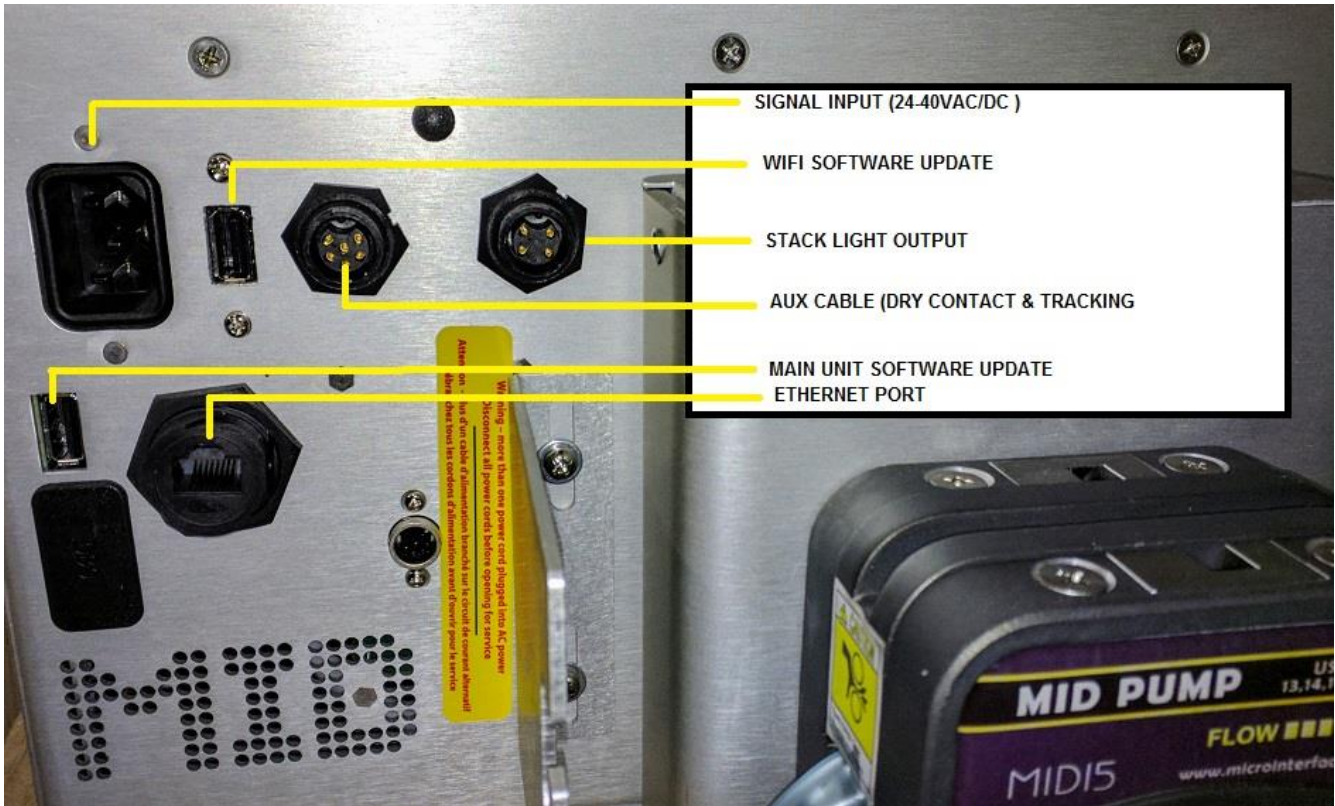Signal cable input is typically the screw recovery signal for an injection molding machine.

(24-240 VAC/DC)

An IEC Cable is provided with the Midexx and this can be cut and a standard connector pair added to the Molding Machine. An Alternative is to hard-wire the cable to the Molding Machine and mark the IEC end of the cable with a "MIDEXX SIGNAL" label.
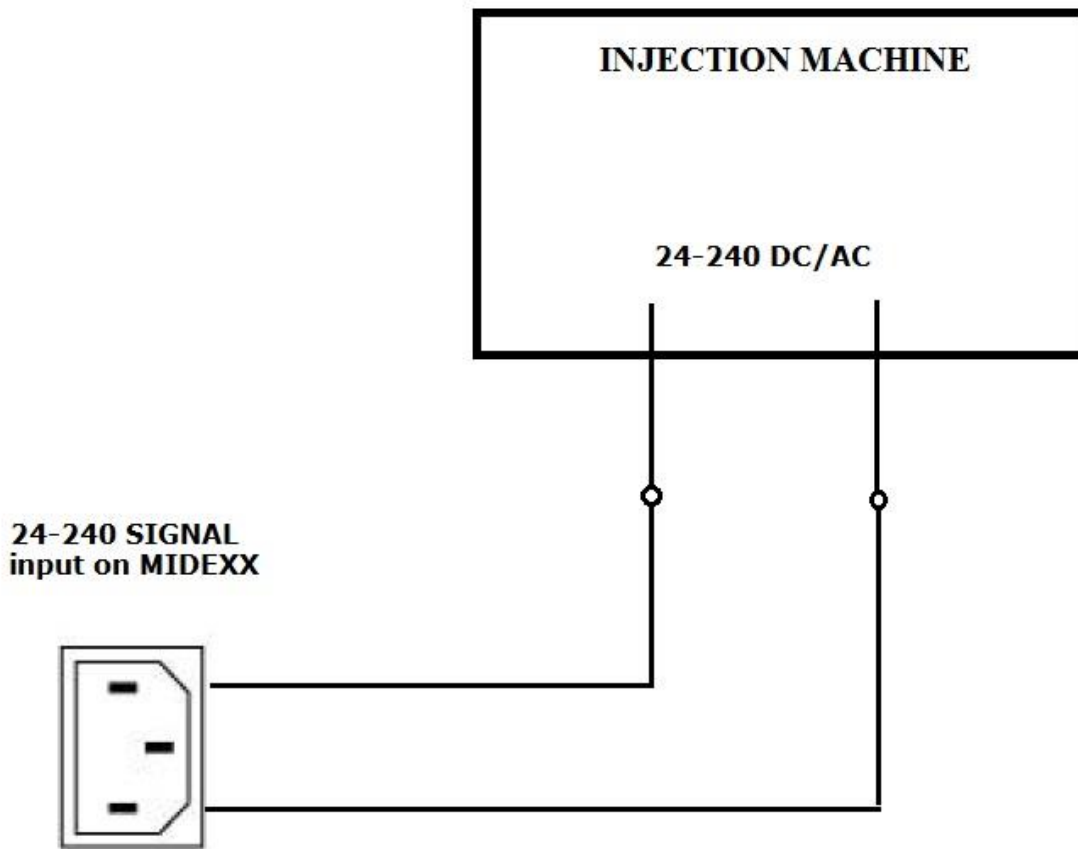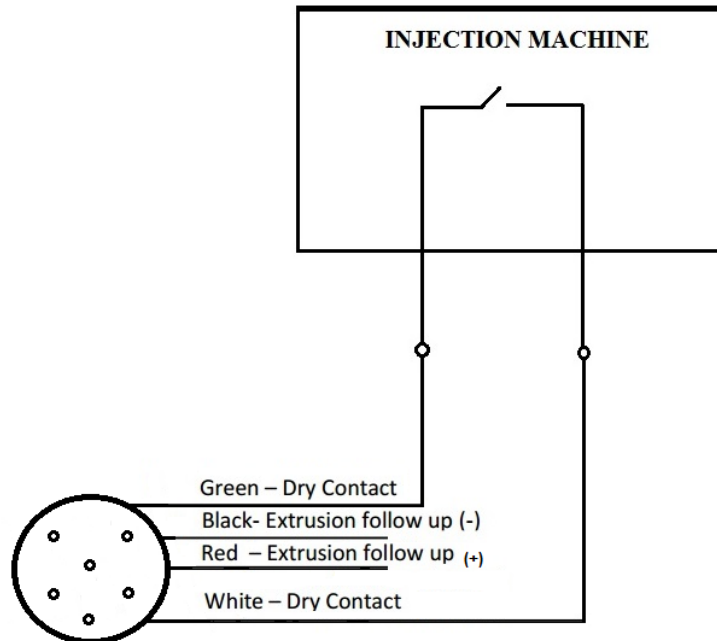

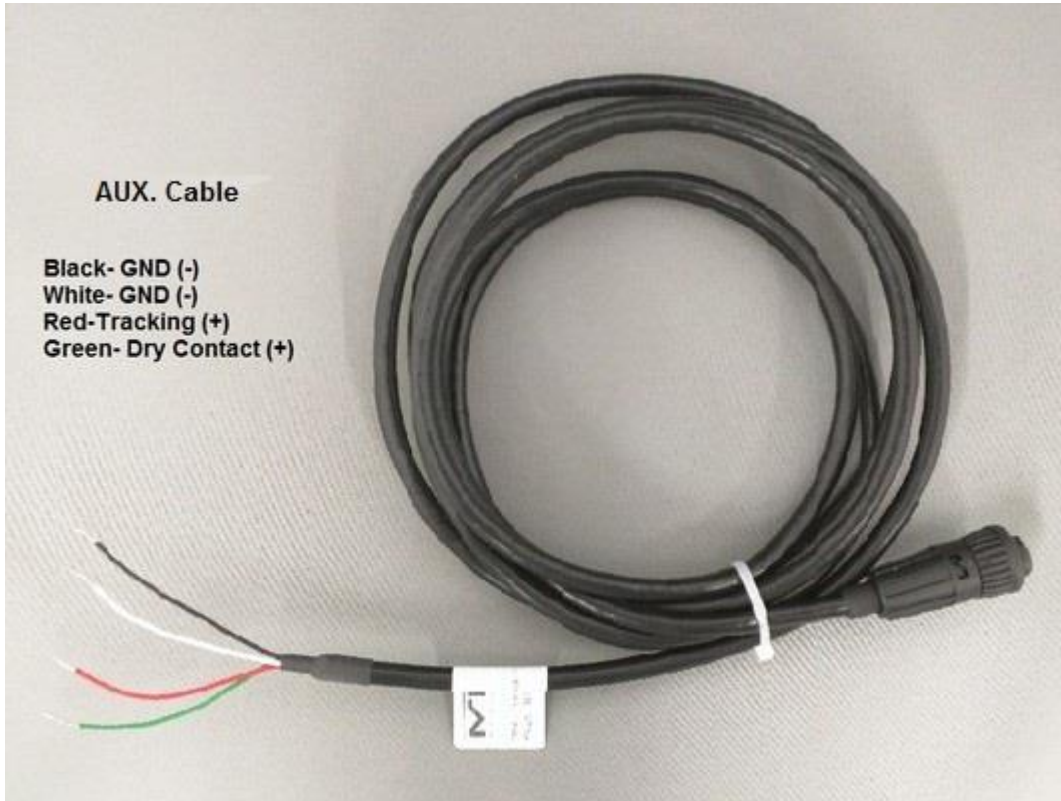## Connection of a Molding Machine with a Relay Contact (Dry Contact)

On the Midexx-3D the Dry Contact input is available from the Auxiliary Port Input. To use this connection you will need to connect the Auxiliary Port Cable to the 6 pin circular Connector on the Back of the Midexx-3D.

SIGNAL INPUT (24-40VAC/DC)

WIFI SOFTWARE UPDATE

STACK LIGHT OUTPUT

AUX CABLE (DRY CONTACT & TRACKING

MAIN UNIT SOFTWARE UPDATE
ETHERNET PORT

The Dry Contact inputs are wires Green and White. Connect these wires to the dry contact (Relay) of the Injection Molding Machine.

INJECTION MACHINE

Green – Dry Contact
Black- Extrusion follow up (-)
Red – Extrusion follow up (+)
White – Dry Contact

The Auxiliary Cable Description.

AUX. Cable

Black- GND (-)
White- GND (-)
Red-Tracking (+)
Green- Dry Contact (+)

Connecting Midexx to an Extrusion Machine.

To Connect a Midexx-3D to an Extrusion Machine an extrusion signal is required.

Extrusion Machines provide this signal in one of the following formats.

- 12V to 24VAC/DC Signal

- 120-240VAC signal

- Relay contact closure (Dry Contact).

The Midexx-3D has been designed to accept this signal as a voltage form 24-240VAC/DC from the "SIGNAL INPUT" or as a contact closure (Dry Contact) from the AUX Port INPUT with and Auxiliary Port Adaptor Cable.

Connection with a Live signal from the Signal Port. (24-240 V AC/DC)

On the Midexx the 24-240 VAC Signal is available on the rear panel of the Midexx and the connection is a standard IEC Receptacle.


Signal

Signal cable input for extrusion applications this is a continuous power supply from the extruder that is on when the extruder is running and off when the extruder is stopped.
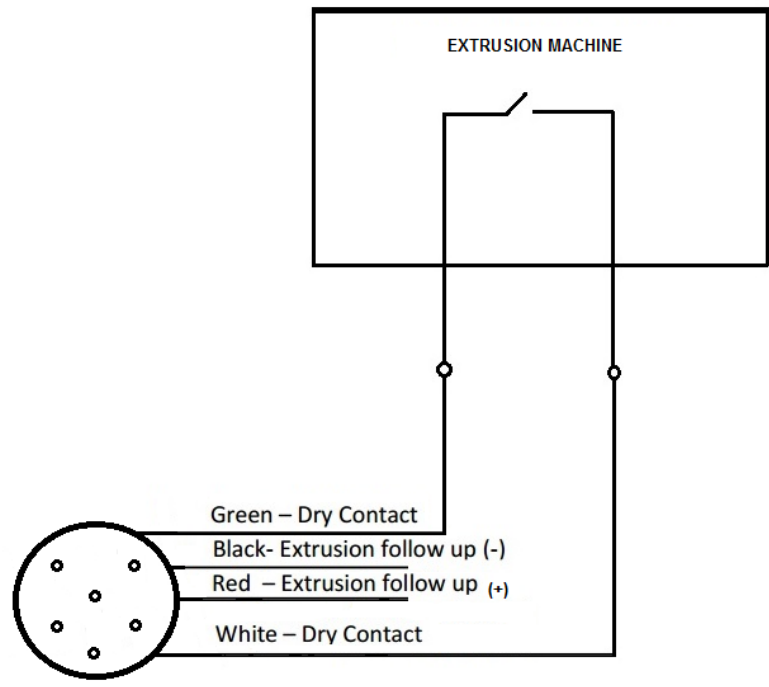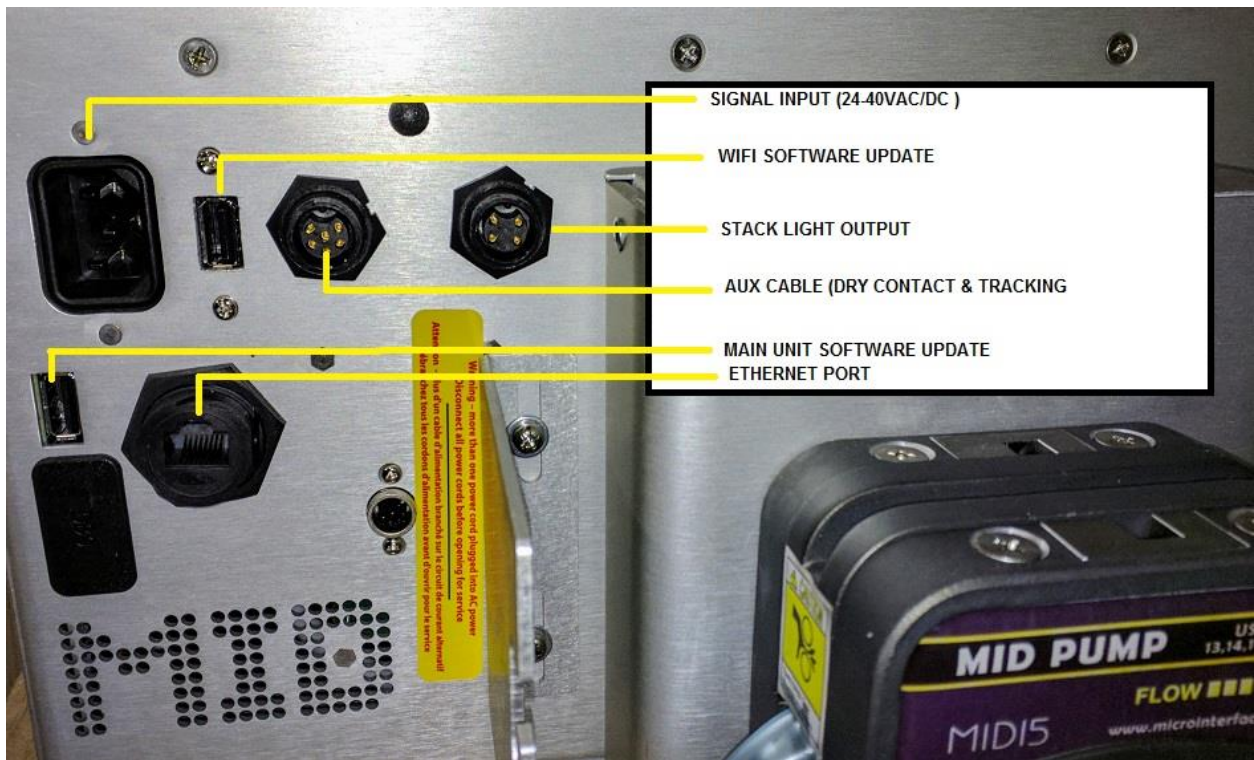
(24-240 VAC/DC)

An IEC Cable is provided with the Midexx and this can be cut and a standard connector pair added to the Extrusion Machine. An Alternative is to hard-wire the cable to the Extrusion Machine and mark the IEC end of the cable with a "MIDEXX SIGNAL" label.
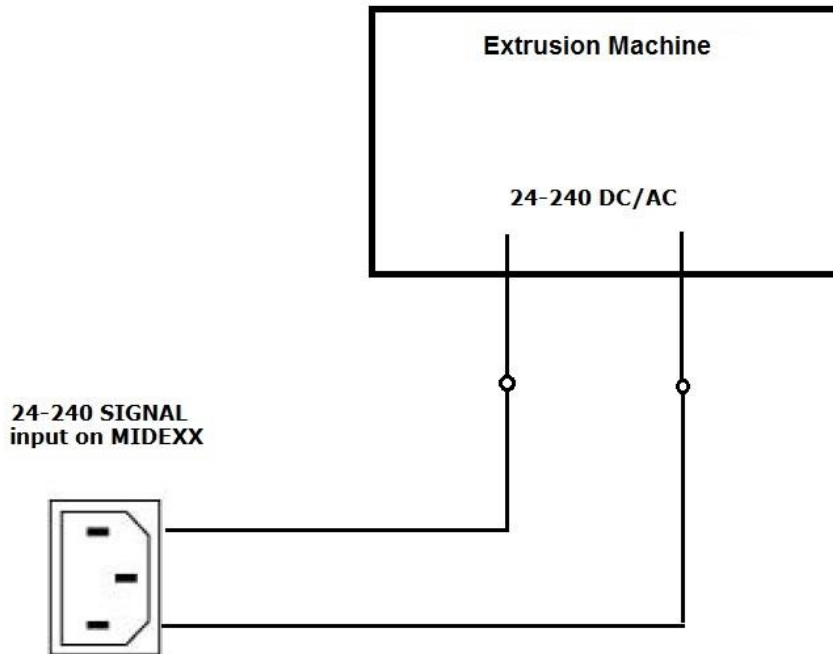
Connection with a Relay Contact Closure (Dry Contact)

On the Midexx the Dry Contact input is available from the Auxiliary Port Input. To use this connection you will need to connect the Auxiliary Port Cable to the 6 pin circular Connector on the Back of the Midexx-3D.

The Dry Contact input are wires Green and White. Connect these wires to the dry contact (Relay) of the extrusion Machine.

SIGNAL INPUT (24-40VAC/DC)

WIFI SOFTWARE UPDATE

STACK LIGHT OUTPUT

AUX CABLE (DRY CONTACT & TRACKING

MAIN UNIT SOFTWARE UPDATE

ETHERNET PORT

MID PUMP

FLOW

MIDI5

EXTRUSION MACHINE

Green – Dry Contact
Black- Extrusion follow up (-)
Red – Extrusion follow up (+)
White – Dry Contact

Extrusion Tracking Mode (Option)

Tracking Mode allows the unit, in extrusion mode, to follow the extrusion signal and increase or decrease speed in relation to the extruder speed. The input signal is selected when the TRACK option is activated by pressing the numeric buttons "1" and "2" simultaneously.

The RPM on the screen is assumed to be the required speed. The controller is designed to accept a tracking signal of 0-10 VDC. The tracking cable provided will attach to the 6 pin circular connector on the MIDEXX-3D, this cable has been tagged to show the polarity of the connection to extrusion. (Red Positive Black is Ground)
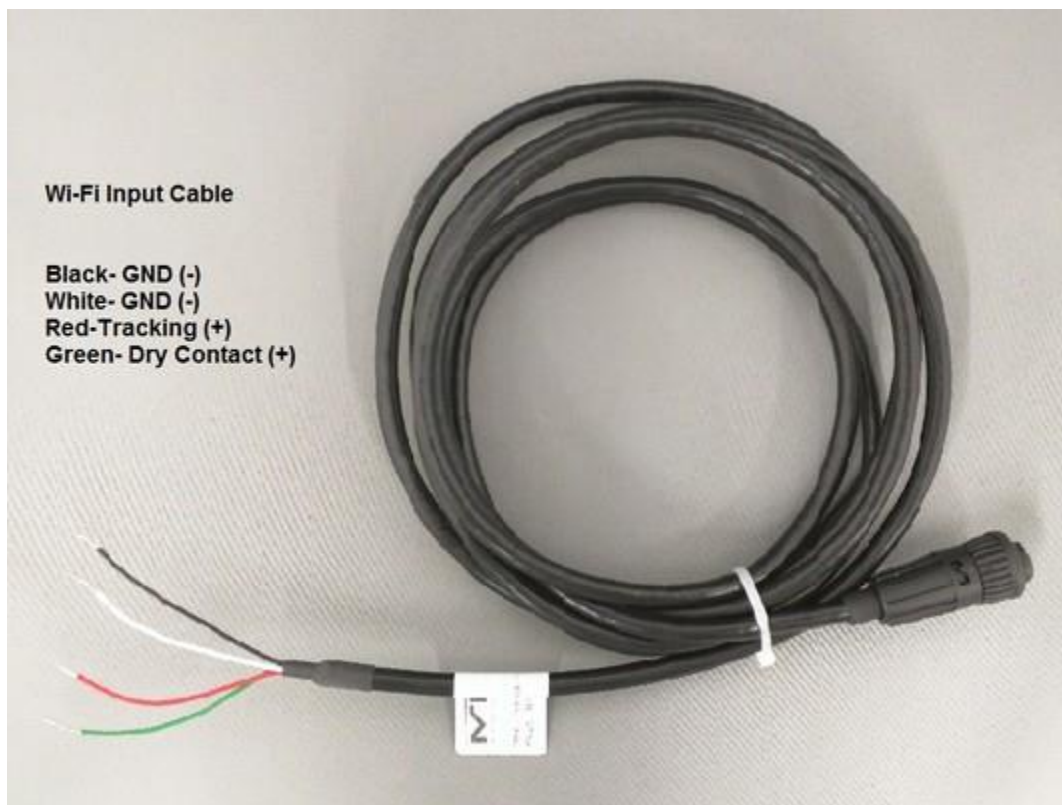
SPECIFICATIONS

- Stepper Motor drive for precise color metering

- Pumping rate from 0.7 to 180 RPM

- Injection mode

- Extrusion tracking mode, 0-10 VDC (optional)

- Automatic adjustment for injection cycle recovery time variations

- Automatic adjustment of output based upon percentage of regrind

- Automatic calibration

- Automatic storage of settings during power down

- Nonvolatile EEPROM storage of settings

- Built-in separate signal timer (Optional)

- Electrical power input of 110 or 220 VAC, 50 or 60 Hz.

- Dimensions, Height x", Width x", Depth x"

- Weight 19KG

- Operating temperature 0 °C ... +55 °C

- Storage temperature -25 °C ... +85 °C

- Relative air humidity (no condensation) 90 %

- Two year warranty on hardware
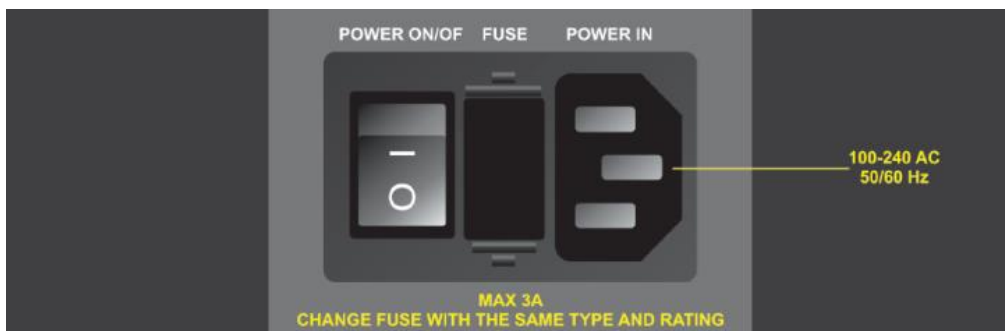
WARRANTY

What the MICRO INTERFACE DESIGN Limited Warranty Covers:

Hardware: MICRO INTERFACE DESIGN (MID) warrants that hardware products listed ("Hardware Products") will be free from material defects in materials and workmanship for the term set forth on the Product warranty list. MICRO INTERFACE DESIGN warrants that software media will be free from material defects in materials and workmanship for a period of two years (2 years).

This Hardware Product warranty covers all MICRO INTERFACE DESIGN parts, accessories, and upgrades sold with your MICRO INTERFACE DESIGN Hardware Product. Unless otherwise set forth on the Product Warranty List, MICRO INTERFACE DESIGN accessories and upgrades purchased and added on to the Hardware Product after the initial Hardware Product purchase assume the warranty deliverables and term of the system into which they are installed.

Software: MICRO INTERFACE DESIGN warrants that software media will be free from material defects in materials and workmanship for a period of two years (2 years).

Limitations: NEITHER PARTY WILL BE LIABLE FOR ANY INDIRECT, PUNITIVE, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES IN CONNECTION WITH OR ARISING OUT OF THIS WARRANTY (INCLUDING, WITHOUT LIMITATION, LOSS OF BUSINESS, REVENUE, PROFITS, GOODWILL, USE, DATA, ELECTRONICALLY TRANSMITTED ORDERS, OR OTHER ECONOMIC ADVANTAGE), HOWEVER THEY ARISE, WHETHER IN BREACH OF CONTRACT, BREACH OF WARRANTY OR IN TORT, INCLUDING NEGLIGENCE, AND EVEN IF THAT PARTY HAS PREVIOUSLY BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. LIABILITY FOR DAMAGES WILL BE LIMITED AND EXCLUDED, EVEN IF ANY EXCLUSIVE REMEDY PROVIDED FOR FAILS OF ITS ESSENTIAL PURPOSE. SOME STATES AND JURISDICTIONS DO NOT ALLOW LIMITATIONS UPON CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU.

YOUR SOLE AND EXCLUSIVE REMEDY AND MICRO INTERFACE DESIGN'S ENTIRE LIABILITY FOR BREACH OF WARRANTY WILL BE: (A) THE REPAIR OR, AT MICRO INTERFACE DESIGN'S OPTION AND EXPENSE, REPLACEMENT OF THE DEFECTIVE PRODUCT, OR, IF SUCH REPAIR OR REPLACEMENT IS NOT REASONABLY ACHIEVABLE, THE REFUND OF THE PURCHASE PRICE. ALL EXPRESS OR IMPLIED CONDITIONS, REPRESENTATIONS, AND WARRANTIES, INCLUDING ANY IMPLIED WARRANTY OR CONDITION OF MERCHANTABILITY, SATISFACTORY QUALITY, FITNESS FOR A

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Warranty Disclaimer:

- Neither the seller nor manufacturer will be liable for any loss, damage or injury directly or indirectly arising from the use of or the inability to determine the use of these products.

- MICRO INTERFACE DESIGN cannot be responsible for how the product is installed or used.

- MICRO INTERFACE DESIGN PRODUCTS are not suitable for use with Explosive or Corrosive fumes, dusts or gases or combinations of fumes, dusts or gases which become Explosive or Corrosive.

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- You shall not (i) modify, reverse engineer, disassemble or reverse compile any portion of the IP, (ii) allow or authorize modify, reverse engineer, disassemble or reverse compile any portion of the IP of the Boards by any third party, (iii) copy, in whole or in part, the IP except as reasonably required for backup or archival purposes. The IP may contain, incorporate or integrate software in object code form which has been licensed from third parties by MID ("Third Party Software"). You may not use any such Third Party Software except in conjunction with the use of the software provided here under as an integrated product.