MTDT24
24-POINT TEMPERATURE SCANNER

Installation & User Manual
5-30-2012

SCAN DISPLAY ALARM

03:BOOT LEFT HB
Temp: 081F*

SEL ↑ ↓ SET CLR

07:RC LEG BLRB
Temp: 082F*

SEL ↑ ↓ SET CLR

SCAN DISPLAY ALARM

MAXI-TRONIC

MAXI-TRONIC
INCORPORATED

OVERVIEW:

The MTDT24 is a microprocessor-based temperature controller which will scan, display and actuate alarms for up to 24 thermocouple sensors. High-Temperature Limit and Rate-of-Rise alarm set points are easily configured and each can activate the 5A SPST (N/O or N/C) relay. An RS232 or RS485 option is available for remote operation up to 2000 feet away using wire and over 2 miles for the wireless connection option. The MTDT24 is fully compatible with the computerized MaxiTrack remote monitoring system providing data archiving and email and cell-phone alarm notifications.

DISPLAY:

The 16 character display shows the sensor number, the sensor ID (if programmed), current temperature, alarm enabled status, and any activated alarms.

> "*" indicates the alarm for this sensor number is enabled
> "F" indicates a High-Temperature alarm for the sensor number listed.
> "R" indicates a Rate-of-Rise alarm for the sensor number listed.

EX.: In this example sensor #20 is labeled "DRY LEG HD L", it is reading 83F and its alarm is enabled(*). Also, both High-Temperature and Rate-of-Rise alarms are tripped on sensor #24:

```
20:DRY LEG HD L
Temp: 083F* FR24
```

If a sensor name is not programmed, the sensor's ID number (1 through 24) is displayed.

SENSOR INPUT:

☞ This unit only accepts ungrounded **Type "T" thermocouple** (Copper/Constantan) input.

☞ You must use Type "T" thermocouple **leadwire** (extension wire) when connecting all sensors to this unit. **Do not use plain copper wire** when running sensors to the MTDT24 scanner.

☞ **Proper polarity** must be observed when making thermocouple connections. There are silver colored Constantan (common) conductors and a copper colored Copper conductors.

**The unit will not function correctly if plain copper wire is used
or if proper thermocouple polarity is not observed.**

Sensor input connector: 25 Pin D-Sub type socket:

> Connect the Copper (-) leads coming from the sensors to inputs #1 through #24.
> All Constantan (+) leads should be joined and connected to input #25.

> All unused inputs should be jumpered to pin 25.

(female socket view)

```
13  OOOOOOOOOOOO   1
25  OOOOOOOOOOOO   14
```

Type "T" Thermocouples:
Copper leads: #1-24,
All Constantan leads: #25

See the **Pigtail Wiring** section at the back of this manual for further wiring instructions.
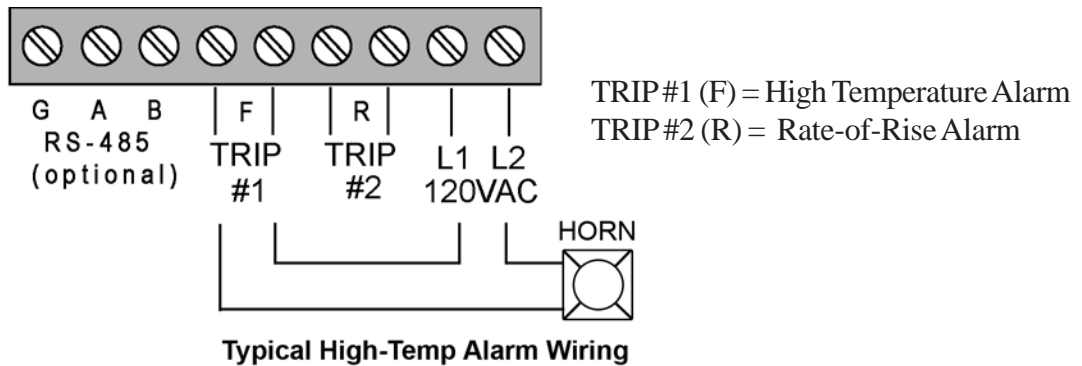Note: A broken thermocouple will typically read 230F.

INPUT POWER:

Input power should not be applied until all thermocouple sensor inputs have been connected! Connect 115 VAC* input voltage to terminals #1 and #2. For wall mount units, these will be the two terminals closest to the internal transformer. Units are factory set up for 115VAC input voltage, *contact Maxi-Tronic for a 230VAC model.

The RS-485 output is fully compatible with MaxiTrack remote monitoring system providing data archiving, and email and cell-phone alarm notifications.

Note: If this unit is being used within a Maxi-Tronic multi-monitor control housing the input power will be pre-wired.

G A B   F   R
RS-485   TRIP   TRIP   L1 L2
(optional)   #1   #2   120VAC

TRIP #1 (F) = High Temperature Alarm
TRIP #2 (R) = Rate-of-Rise Alarm

HORN

Typical High-Temp Alarm Wiring

RELAY OUTPUTS:

Relay contacts are rated at 5 amps @117VAC, SPST, N/O or N/C user selectable. Scanners are set for N/O relay operation at the factory.

High-Temperature alarm (F) relay output is located on terminals #5 and #6. If this is being used within a Maxi-Tronic multi-monitor, this will be pre-wired for a common alarm output (typically through DIN-rail isolation relays) with other Maxi-Tronic controls.

Rate-of-Rise alarm (R) relay output is located on terminals #3 and #4 on the terminal strip.

SYSTEM TESTING:

Disconnect a sensor wire and the scanner should sound the alarm and display the sensor number. A display of 230F indicates a broken (open) thermocouple sensor wire.

SYSTEM CONFIGURATION

After making any configuration changes to the MTDT24, you should cycle the power (off for a couple seconds then back on) of the MTDT24 to reset it.
The following options are available through the MTDT24 menu system:

SCAN RATE:

The sensor scan rate is adjustable from 1.0 to 4.0 seconds per sensor.
The Scan option is selectable for Automatic scanning or Manual operation.

ALARM OPERATION:

Each sensor's alarm can be enabled or disabled. An asterisk will display next to each sensor's temperature reading when its alarm is enabled. Ex.: **24: Temp: 073F***

High-Temperature alarm:
The High-Temperature alarm setpoint is the same for all sensors. If you want the High-Temperature alarm to activate at 140°F, then all sensors will alarm at that point. If the High-Temperature set-point is reached on a sensor, an "**F**" will display along with the sensor number that tripped the alarm. Example: **F 24**
NOTE: Relay #1 will remain tripped until the temperature falls back below the alarm set-point.

Rate-of-Rise alarm:
The Rate-of-Rise alarm is adjustable from 1° to 99° F (Ex.: 10F) temperature change. If the temperature increases by this amount from the previous scan then the alarm will trip. This setting is the same for all sensors. If the Rate-of-Rise limit is reached on a sensor, an "**R**" will display along with the sensor number that tripped the alarm. Example: **R24**
NOTE: Relay #2 will remain tripped only while the rate-of-rise limit is exceeded for a scan cycle.

SILENCING THE ALARM:
PRESS THE "SET" or "CLR" BUTTON TO SILENCE THE ALARM(s).
☞ **Note: "SET" will allow the scanner to continue scanning BUT will prevent any new alarms from tripping until the unit is reset.**
☞ **Note: "CLR" will silence the alarms and stop the unit from scanning. Placing the unit back in scan mode will reset the unit and allow new alarms to trip.**

The alarm will be silenced as long as any sensor remains tripped. When all sensor(s) gets back within limit and the alarm condition no longer exists then the silenced alarm will automatically reset and re-enable itself. You can manually reset and re-enable a silenced alarm by :
- Pressing CLR, then going back into Scan mode.
- Or, by cycling the power (off for a couple seconds then back on) of the MTDT24 unit.

To lock-out a sensor (i.e. a malfunctioning sensor) and prevent it from tripping false alarms, DISABLE that sensor. Restart (cycle the power) the MTDT24 after making this change.
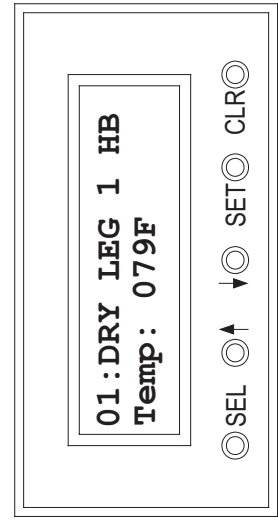
PROGRAMMING:
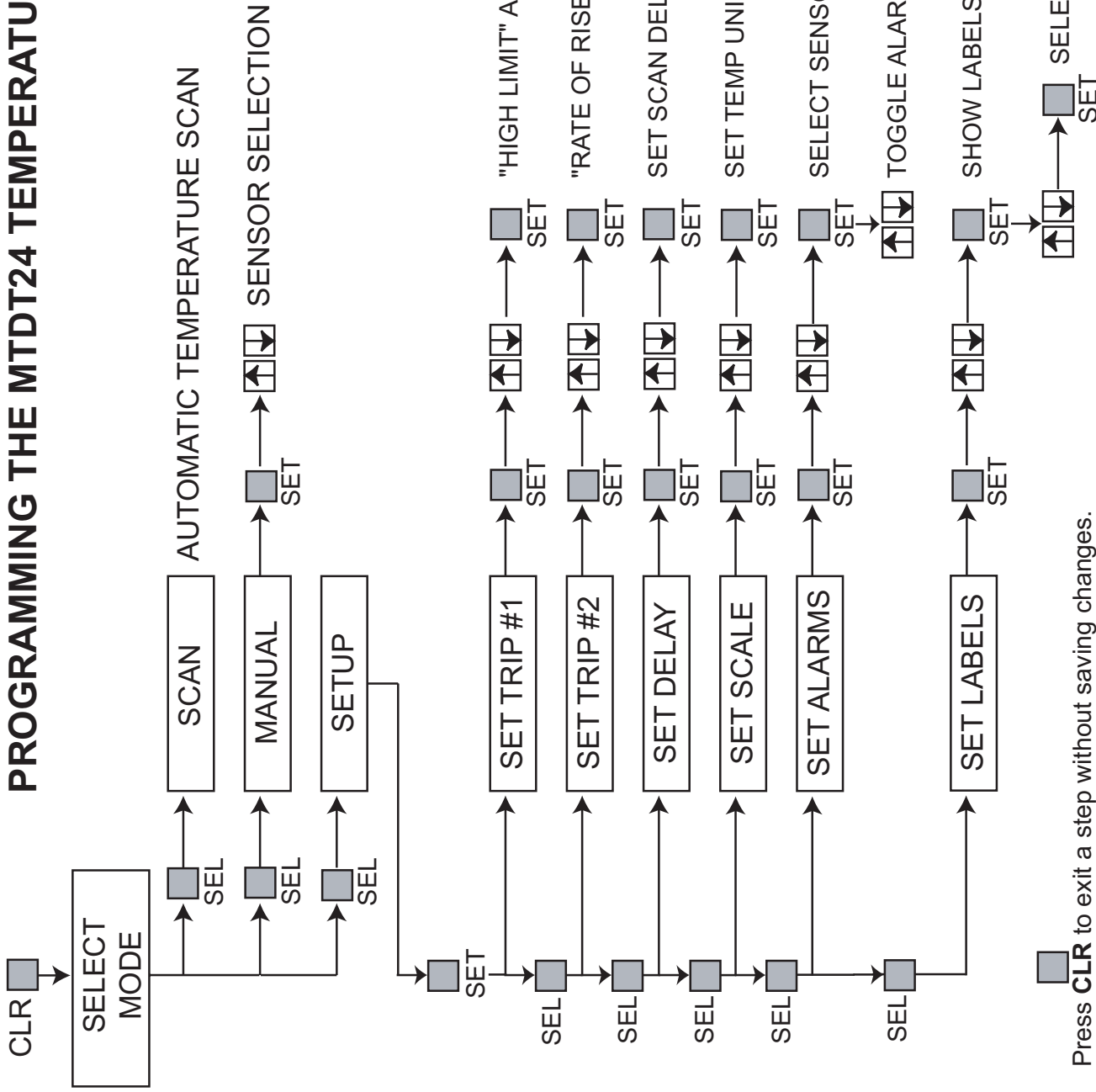The unit is programmed through the 5 pushbutton switches on the front of the control.
- Press SEL to step through the options.
- Press SET to pick an option.
- Use the arrow keys to step through sensors, toggle a setting On /Off, and to enter chracters and numbers.
- Press SET after using the arrow keys to 'enter' and save a change.
- If you make a mistake entering an ID, save it then go back in and re-enter the ID.
Note: You are limited to 12 characters for a sensor ID, entering more will overwite the following sensor's ID!

PROGRAMMING THE MTDT24 TEMPERATURE SCANNER

```
01:DRY LEG 1 HB
Temp: 079F
```
◎ SEL ◎↑ ↓◎ SET◎ CLR◎

RESET the unit after making programming changes. Do this by POWERING DOWN the unit for a few seconds.

CLR ▪

SELECT MODE

SCAN — AUTOMATIC TEMPERATURE SCAN
SEL

MANUAL
SEL
▪ SET → SENSOR SELECTION

SETUP
SEL

▪ SET

SET TRIP #1
SEL
▪ SET → ▪ SET → "HIGH LIMIT" ALARM

SET TRIP #2
SEL
▪ SET → ▪ SET → "RATE OF RISE" ALARM

SET DELAY
SEL
▪ SET → ▪ SET → SET SCAN DELAY: 1.0 to 4.0 SEC

SET SCALE
SEL
▪ SET → ▪ SET → SET TEMP UNITS: °F or °C

SET ALARMS
SEL
▪ SET → ▪ SET → SELECT SENSOR #
→ TOGGLE ALARM: On or Off (Disable), Press **SET** then **CLR**

SET LABELS
SEL
▪ SET → ▪ SET → SHOW LABELS: On or Off
→ SELECT SENSOR #
▪ SET → ENTER LABEL, 12 CHAR MAX.

▪ Press **CLR** to exit a step without saving changes.

Moving the cursor (with **SET**) all the way to the right (position 13) will move you to the next sensor. **CAUTION:** This will delete any existing label on the next sensor.
Press **SEL** to save and exit the current sensor without moving to the next sensor.
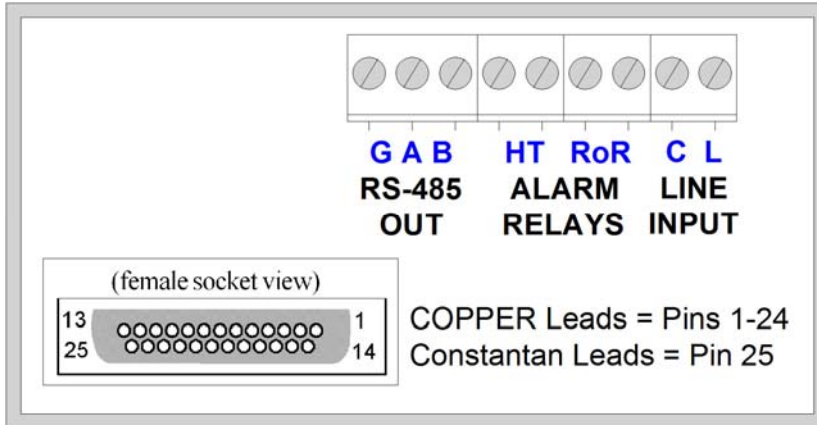
▪ SET= NEXT CHARACTER
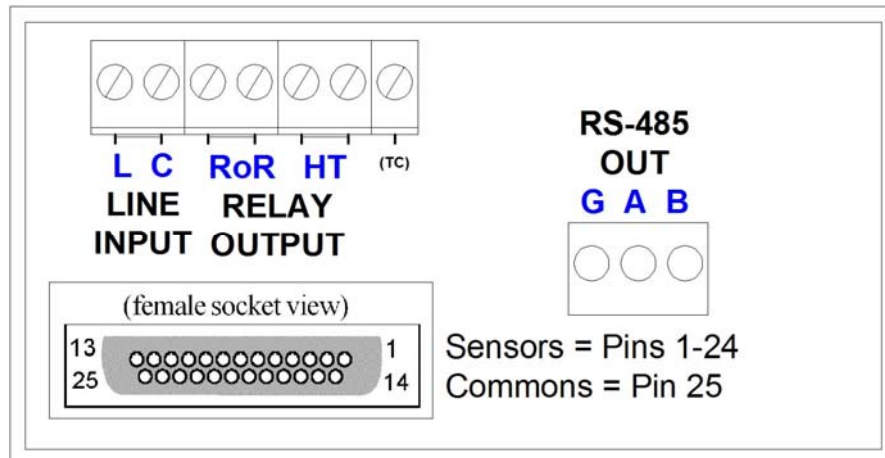▪ SEL= SAVE & EXIT
Do not press CLR on this step.

MTDT24 Temperature Scanner Wiring
Series I and Series II
7-10-2008

G A B   HT RoR   C L
RS-485   ALARM   LINE
OUT   RELAYS   INPUT

(female socket view)

13   OOOOOOOOOOOO   1
25   OOOOOOOOOOOO   14

COPPER Leads = Pins 1-24
Constantan Leads = Pin 25

Series I

L C   RoR HT   (TC)   RS-485
LINE   RELAY   OUT
INPUT OUTPUT   G A B

(female socket view)

13   OOOOOOOOOOOO   1
25   OOOOOOOOOOOO   14

Sensors = Pins 1-24
Commons = Pin 25

Series II (Introduced 2008)

Supply: 120VAC 50/60 HZ
Relays: 5A, Normally Open. Closes on alarm

PIGTAIL WIRING

The MTDT-24 Scanners are provided with a 'pigtail' cable pre-wired to the 25-pin D-Sub connector on the back of the unit. Crimp your sensor wiring to the pigtail, <u>only</u> use the supplied crimps.

<div align="center">

COLOR CODING FOR THE PIGTAIL

The pigtail consists of two 12TC leadwires soldered to a 25 pin D-Sub connector.
<u>Each</u> leadwire has 2 Commons and 12 sensor inputs for a total of 4 commons and 24 inputs.
The Commons (White and Brown) are wrapped around a "Group" of 6 Sensor Inputs wires.
The Commons have a siver colored conductor and the Sensor Inputs have a copper colored conductor (pull the insulation back a little to see the color of the conductor inside).
Match the polarity (silver-vs-copper conductor) when attaching sensors.
Note: all the Commons are tied together and can be used interchageably.

</div>

LEAD WIRE #1		LEAD WIRE #2	
WHITE COMMON GROUP		**WHITE COMMON GROUP**	
STATION#	COLOR	STATION#	COLOR
1.	BLACK	13.	BLACK
2.	BLUE	14.	BLUE
3.	GREEN	15.	GREEN
4.	RED	16.	RED
5.	YELLOW	17.	YELLOW
6.	CLEAR	18.	CLEAR
Common	**WHITE**	**Common**	**WHITE**
BROWN COMMON GROUP		**BROWN COMMON GROUP**	
STATION#	COLOR	STATION#	COLOR
7.	BLACK	19.	BLACK
8.	BLUE	20.	BLUE
9.	GREEN	21.	GREEN
10.	RED	22.	RED
11.	YELLOW	23.	YELLOW
12.	CLEAR	24.	CLEAR
Common	**BROWN**	**Common**	**BROWN**

Varistors are used to suppress electrical surges and "noise".   When used on an MTDT24
Temperature Scanner they suppress the spark caused when the relay contacts are opened or closed.

Specs: 130VAC Maximum.
Contact Maxi-Tronic for other voltage options.

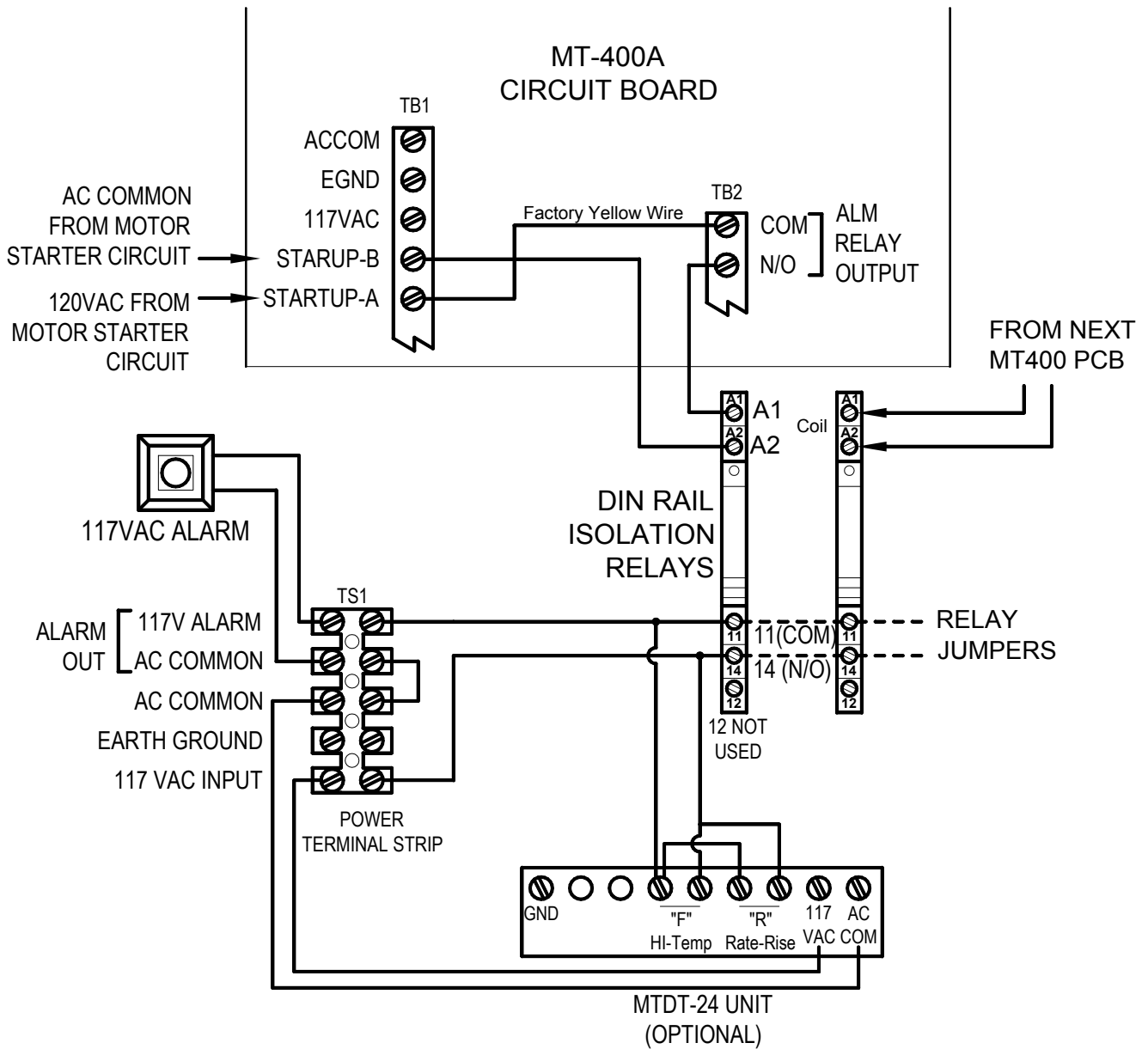Connect the varistors across each of the relay output terminals:

MAXI-TRONIC
PROCESS SENSORS AND CONTROLS
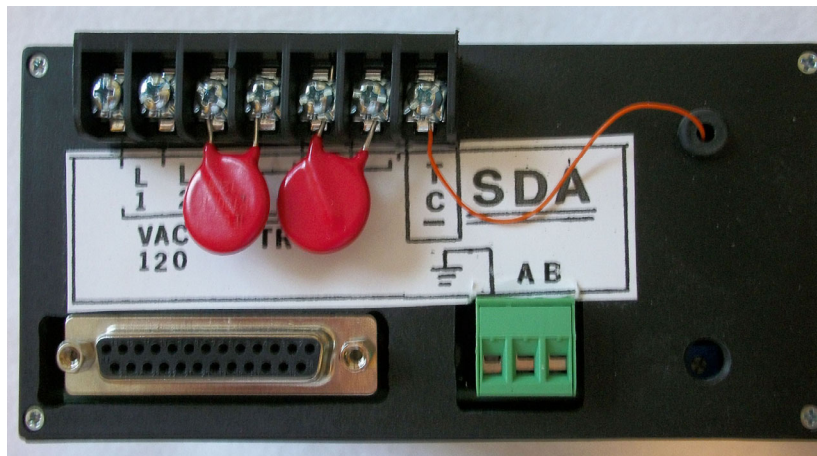
417 Wards Corner Rd.
Loveland, OH 45140
TEL: 513.398.2500   FAX: 513.398.2536
www.maxitronic.com info@maxitronic.com

WIRING A SINGLE ALARM OUTPUT FOR MULTIPLE MOTION AND MTDT-24 TEMPERATURE SCANNER CONTROLLERS

MT-400A
CIRCUIT BOARD

TB1

ACCOM
EGND
117VAC
STARUP-B
STARTUP-A

AC COMMON
FROM MOTOR
STARTER CIRCUIT

120VAC FROM
MOTOR STARTER
CIRCUIT

Factory Yellow Wire

TB2

COM
N/O

ALM
RELAY
OUTPUT

FROM NEXT
MT400 PCB

A1
A2

Coil

A1
A2

DIN RAIL
ISOLATION
RELAYS

117VAC ALARM

TS1

ALARM
OUT

117V ALARM
AC COMMON

AC COMMON

EARTH GROUND

117 VAC INPUT

POWER
TERMINAL STRIP

11   11(COM)   11

14   14 (N/O)   14

12   12

RELAY
JUMPERS

12 NOT
USED

GND   "F"   "R"   117   AC
        HI-Temp Rate-Rise VAC COM

MTDT-24 UNIT
(OPTIONAL)

2/11/2014

MaxiTrack Programming Worksheet

Complete one worksheet per: 1 Temperature Scanner (24 sensors) and up to 3 Motion controllers.

Company Name:

Company Location:

Maxi-Tronic Job #:

Worksheet #

MT400 Motion Controllers
Leg Names:

	Motion #1		Motion #2		Motion #3	

MTDT24 Temperature Scanner
Temperature Sensor Names:
Enter sensor name (up to 12 characters and spaces)

Circle sensor type:
HB= Bearing
RB = Belt Misalignment

	Name	Type		Name	Type		Name	Type
1		HB RB	9		HB RB	17		HB RB
2		HB RB	10		HB RB	18		HB RB
3		HB RB	11		HB RB	19		HB RB
4		HB RB	12		HB RB	20		HB RB
5		HB RB	13		HB RB	21		HB RB
6		HB RB	14		HB RB	22		HB RB
7		HB RB	15		HB RB	23		HB RB
8		HB RB	16		HB RB	24		HB RB

Scanner Location:

Scanner # (1-12):

High Temperature Trip:

Rate-of-Rise Trip (°/cycle):

Scan Rate (seconds per sensor):

Units: 1 2 4   °F °C

EchoTrack Remote Display
Display data for this Page on an EchoTrack? Y N

EchoTrack location:

EchoTrack #: