LAYOUT

1. Power / Motor Terminals (P1)
2. Signal Terminal (P2)
3. Fuse
4. Expansion Header (P4) (option)
5. Position Switches Header (P5)
6. Feedback Potentiometer Header (P7)
7. Feedback Potentiometer Header (P7)
8. Thermistor Header (P8) (option)
9. Stop (Torque) Switches Header (P9)
10. Operation Module Slot
11. Joystick
12. Display
13. LEDs
14. Run/Program Switch
15. USB Connector

TERMINAL WIRING

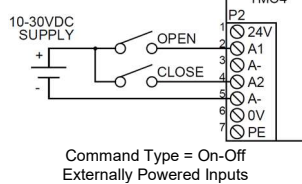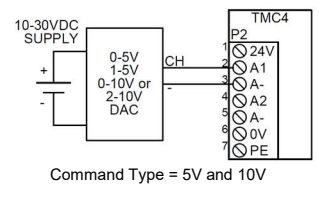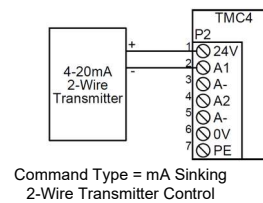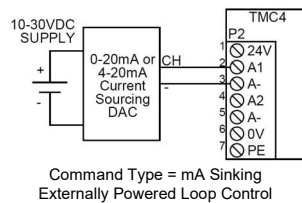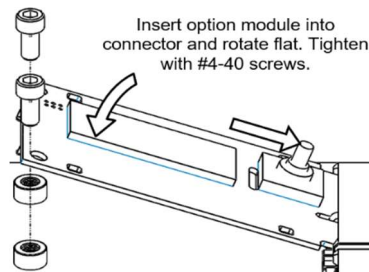| (P1) Power/Motor Terminals		Function
1	Heater L/+	Supply power output for heater. Internally connected to Supply L/+ terminal.
2	Supply L/+	Supply Power Line or (+)
3	Supply N/-	Supply Power Neutral or (-)
4	External Brake	Output for spring return electric actuator brakes. Switches supply power when motor outputs are energized. AC version: Switch off when motor on. DC version: Switch on when motor on.
5	Motor CW	AC version: Energize clockwise motor winding. DC version: Switch (+) supply voltage for clockwise operation.
6	Motor CCW	AC version: Energize counterclockwise motor winding. DC version: Switch (+) supply voltage for counterclockwise operation.
7	Motor N	Internally connected to Supply N/- terminal. Can be used for second heater connection. AC version: Motor neutral. DC version: No motor functionality

(P2) Signal/Comm Terminals		Function
1	+24V Out	Auxiliary 24VDC output.
2	I/O 1 (A1) Signal In	Command signal input.
3	Signal GND	Command signal reference.
4	I/O 2 (A2) Signal Out	Feedback signal output.
5	Signal GND	Feedback signal reference.
6	GND / 0V	0V reference for +24V output.
7	Earth	Connected to enclosure through TMC4 mounting bracket.

MODULE INSTALLATION

Insert option module into connector and rotate flat. Tighten with #4-40 screws.

SIGNAL WIRING CONFIGURATIONS

Command Type = mA Sinking
Externally Powered Loop Control

Command Type = mA Sinking
2-Wire Transmitter Control

Command Type = 5V and 10V

Command Type = On-Off
Externally Powered Inputs

Command Type = On-Off
Using TMC-4 +24V Output

Command Type = Potentiometer

Feedback = mA or V

ACTUATOR WIRING

AC Proportional Control

AC Two Position Control

DC Proportional Control

DC Two Position Control

TRIAC CONTROLS
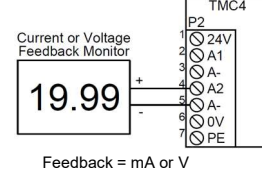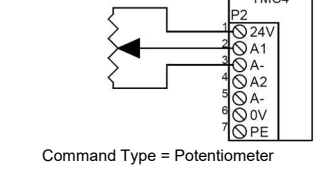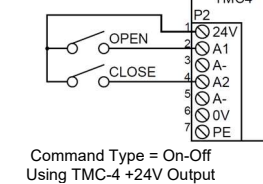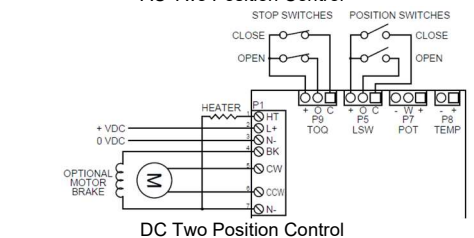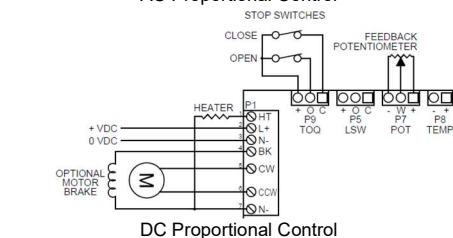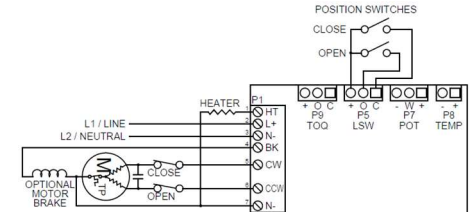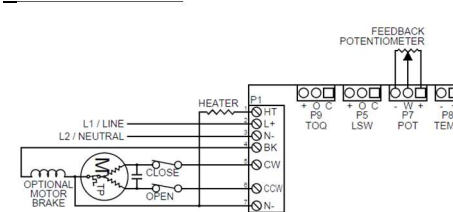
CALIBRATION

Center Potentiometer and Set Positions
1. Enter "Position Config" submenu.
2. Verify "Position Type" is set to "Potent".
3. Enter "Calibrate Close Pos".
4. Manually operate actuator to 50% position using joystick [PREVIOUS] and [NEXT] or using actuator manual override.
5. Adjust feedback potentiometer until value reads between 1900-2200, then tighten potentiometer gears.
6. Operate actuator to CW position and press [CONFIRM] to save position.
7. Enter "Calibrate Open Pos".
8. Operate actuator to CCW position and press [CONFIRM] to save position.

Approximate potentiometer ranges with potentiometer centered exactly to 2048 at 50% position. Specific values are not as important as ensuring value does not jump between 0 and 4095 inside of operation range.

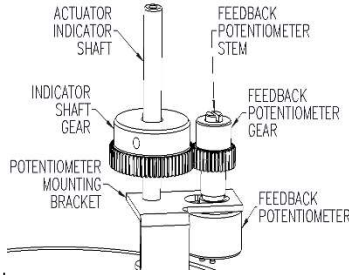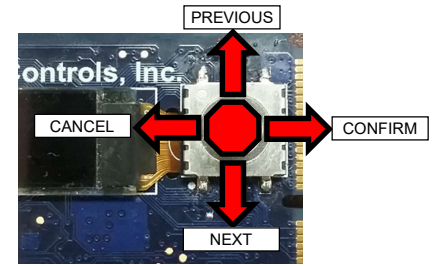| Gear Ratio / Actuator Rotation	Minimum	Maximum	Range
1:1 / 90°	1506	2590	1084
1:1 / 180° or 2:1 / 90°	964	3132	2168
1:1 / 270° or 3:1 / 90°	422	3674	3252

Set Command Signal
1. Enter "Command Config" submenu.
2. Verify "Command Type" is set to desired command signal type.
3. Enter "Command Zero" then send 0% command signal and press [CONFIRM] to save.
4. Enter "Command Span" then send 100% command signal and press [CONFIRM] to save.

Set Feedback Signal
1. Enter "Feedback Config" submenu.
2. Verify "Feedback Type" is set to desired command signal type.
3. Enter "Feedback Zero" then use [PREVOUS] or [NEXT] to step feedback signal to desired 0% signal and press [CONFIRM] to save.
4. Enter "Feedback Span" then use [PREVOUS] or [NEXT] to step feedback signal to desired 100% signal and press [CONFIRM] to save.

Command, Feedback and Position settings for Direct or Reverse Action.

Direct Action	Signal	Command	Feedback	Position
	0%	Zero	Zero	Close/CW
	100%	Span	Span	Open/CCW

Reverse Action	Signal	Command	Feedback	Position
	100%	Zero	Zero	Close/CW
	0%	Span	Span	Open/CCW

Approximate command and feedback signal count values.

Signal	Command	Feedback
0mA	0	280
4mA	750	925
20mA	3740	3550
0V	0	
1V	380	
2V	760	
5V	1900	
10V	3800	

NAVIGATION
- Press [CONFIRM] to enter setting and save changes. Setting value will flash when setting is entered.
- Press [CANCEL] to escape menu or exit setting without saving.
- Press [PREVOUS] or [NEXT] to step through menus or settings, or manually operate actuator CCW or CW in appropriate menu.

MENU

A	
HOME	<---> MANUAL OP
CONTROL	confirm x3 to enter
TEMPERATURE	cancel x3 to exit
SWITCHES	
COMMS	B
CONFIGURE >>	<---> Command Config >> <--->
A	

Command Config >> settings:
- Command Type
- Command Zero
- Command Span
- Deadband
- Loss of Signal
- Fail to Percent
- Motor Temp Limit

Feedback Config >> settings:
- Feedback Type
- Feedback Zero
- Feedback Span

Position Config >> settings:
- Position Type
- Calibrate Close Pos
- Calibrate Open Pos
- Travel Timeout
- Switch Action

Comms Config >> settings:
- Comms Type
- Unit ID
- Baudrate
- Parity
- Timeout
- IP Settings

Aux. I/O Config >> settings:
- Aux. DO Signal
- Aux. DI Signal
- Aux. AO Signal
- Calib. Aux AO Zero
- Calib. Aux AO Span
- Calib. Aux DO Close
- Calib. Aux DO Open

System >> settings:
- Brake Type
- Cycle Count
- Clear Cycle Count
- Restore Defaults
- Software / Hardware Version

TROUBLESHOOTING

Problem	Resolution
No Display	• In Sleep Mode. Press joystick in any direction to wake. • Ensure Run/Program switch is pointed away from USB connector. • Ensure supply power present or fuse is not blown.
Not Moving to set positions	• Check mechanical stops, or limits switches are not adjusted in too far • Ensure potentiometer gears are not loose. Recalibrate if so.
Movement in wrong direction	• Open and Close positions set incorrectly, or Zero and Span reversed. • Motor CW / CCW wiring reversed.

Problem	Resolution
Not responding to command signal	• Check command signal and position calibration. • Ensure feedback potentiometer is centered, gears are not loose. Recalibrate if so.
No feedback or feedback incorrect	• Check feedback calibration. • Ensure no external loop power is provided.
Hunting	• Noisy input signal, or Deadband setting too low.

A-T Controls, Inc.
www.atcontrols.com