TELEDYNE
INSTRUMENTS
Advanced Pollution Instrumentation
A Teledyne Technologies Company
9480 Carroll Park Rd., San Diego, CA 92121-2251
Phone (858) 657-9800 Fax: (858) 657-9818 Toll Free 1800 324-5190
E-mail: api-customerservice@teledyne.com http://www.teledyne-api.com

Service Note

08-012 ***Rev A***.
27 May 2008

CONTROLLING AN OPTICALLY ISOLATED RELAY USING THE CONTROL OUPUTS FROM AN M700E OR M703E

I. PURPOSE:

The purpose of this document is to describe one method of using the Control Outputs to switch an external AC powered device. TAPI recommends using an Optically Isolated Solid State Relay. The relay referenced in this in this procedure is an OPTO22; 120D3 (the exact model will depend on your application) witch are available through Opto22, http://www.opto22.com/.

II. TOOLS:

Philips screwdriver, small straight slot screwdriver, wire cutters/strippers capable of stripping 22 gauges wire.

III. PARTS:

- OPTO22, 120D3 (the exact model will depend on your application).
- OPTO22 SAFETY COVER
- 22 gauge insulated wire.

IV. PROCEDURE:

The M700E and M703E are equipped with Control Outputs. This feature allows the calibrator to control devices that accept logic-level digital inputs, such as PLC's, data loggers or digital relays/valve drivers.

The Control Outputs can be used as:

- 12 separate ON/OFF switches assigned to separate calibration sequences.
- A 12-bit wide bus allowing the user to define activation codes for up to 4095 separate calibration sequences.

They can be set to:

- Be activated/deactivated whenever a particular calibration sequence is operating.
- Activate/deactivate as individual steps within a calibration sequence are run.

The OPTO22 should be mounted in a secure location, additional mounting information may be available through OPTO22.

1. Tying together the "E" (Emitter) of the CONTROL OUTPUTS to the ground connection see Figure A.

Locate the connector "CONTROL OUTPUTS" on the rear panel of the instrument.
On the CONTROL OUTPUTS, locate the individual connection labeled "E" and secure one end of a length of 22-gauge wire.
On the CONTROL OUTPUTS, locate the individual connection labeled with the digital ground symbol "⏚" and secure the other end of the 22-gauge wire connected to the "E" connector.

Information contained herein is classified as EAR99 under the U.S. Export Administration Regulations. Export, reexport or diversion contrary to U.S. law is prohibited.

2. Connecting the Control side of the Relay to 5 Volts, see Figure A.

On the STATUS connector, locate the individual connection labeled “+5VDC and secure one end of a length of 22-gauge wire.
On the Relay (OPTO22), locate the positive (+3) tie-down and secure the second end of 22-gauge wire.

The control side of an optically isolated relay typically pulls less than 20mA. If your relay pulls 50mA or more, it will be necessary to use more than one CONTROL OUTPUT.

3. Connecting the Control side of the Relay to the CONTROL OUTPUTS, see Figure A.

On the CONTROL OUTPUTS, locate and select one (or more) of the individual connectors labeled “1 through 12” and secure one end of the 22 gauge wire to each CONTROL OUTPUT to be used. A maximum of 6 connections may be used to power your relay with a total that cannot exceed 300mA.
Secure the loose end of these 22 gauge wires to the negative (4) tie-down on the Relay (OPTO22).

4. Connecting the OPTO22 to the AC powered device you wish to control.

A licensed electrician should perform these connections. The model of the OPTO22 and the gauge of wire chosen will depend on the amount of current that your AC powered device pulls, see Figure A.
Once all of the electrical connections have been completed, be sure to install the OPTO22’s safety cover.

Figure 1

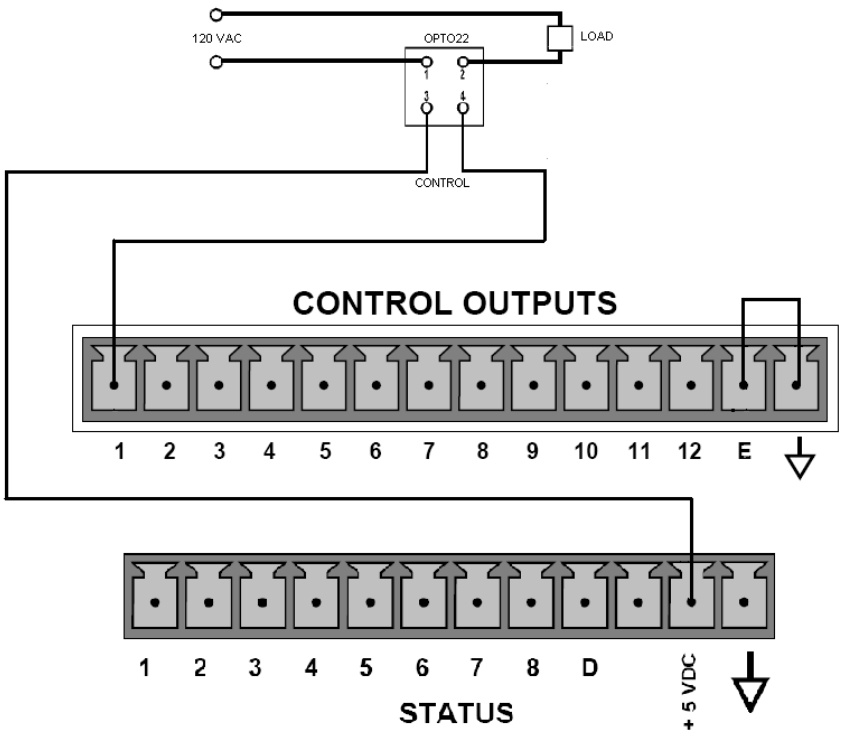

Figure A.

Information contained herein is classified as EAR99 under the U.S. Export Administration Regulations. Export, reexport or diversion contrary to U.S. law is prohibited.

5. Programming the **CONTROL OUTPUTS**:

Make sure that the M700E/M703E is in **STANDBY** mode

Press **SETUP** – **PRIMARY SETUP MENU** will be displayed

Press **SEQ** - **SEQUENCE CONFIGURATION** will be displayed

Press **EDIT** - **END OF SEQUENCES** - this only appears if no sequences are currently programmed. To program a sequence, please see ***section 6.5*** of your owner's manual.

If you already have a sequence programmed, the display will show:

1) SEQ [NAME], [X] STEPS - will be displayed.

Press **EDIT** - **1) SEQ [NAME], [X] STEPS** will be displayed.

Press **SET>** - until **SETUP X.X CC OUTPUT:** DISABLED is displayed.

Press **EDIT** – **OFF** will be displayed.

Press **OFF** - Toggle this key turns the **CONTROL OUTPUTS ON/OFF**, it should now be **ON**.

Press **ENTER - SETUP X.X CC OUTPUT: [0]00000000000** will be displayed.

Press **<CH CH>** - Moves the cursor one character left or right. Each bit shown on the display represents one of the **CONTORL OUPUT** pins located on the back of the M700E/ M703E, The left most bit is Bit 1, the next bit to the right, bit 2, progressing rightward to bit 12 (see Figure A)

[0] - Toggle this key to turn the selected bit ON/OFF (0 or 1).

Press **ENTER** - **SETUP X.X CC OUTPUT: [1]00000000000** will be displayed.

Press **EXIT** four times to return to the main display screen.

In this example, when the auto sequence initializes, Bit 1 of the **CONTROL OUTPUT** will go HI (5 volts), activating the relay.

NOTE: Use Signal I/O to test operation.

Information contained herein is classified as EAR99 under the U.S. Export Administration Regulations. Export, reexport or diversion contrary to U.S. law is prohibited.