

**THOMSON TECHNOLOGY.**

**POWER & CONTROL**  
A REGAL-BELOIT COMPANY

# **SDM**

## **SERVICE DISPLAY MODULE FOR TSC 80 TRANSFER CONTROLLER**

### **INSTALLATION, OPERATING & SERVICE MANUAL**

PM065 REV 0 04/12/08

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## 1. INTRODUCTION

### 1.1. PRODUCT REVISION HISTORY

The following information provides an historical summary of changes made to this product since the original release.

#### Operating & Service Manual Version

Rev 0 04/12/03	Original release
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Contact Thomson Technology, to obtain applicable instruction manuals. Soft copy of most current version is available at [www.thomsontechnology.com](http://www.thomsontechnology.com).

The following information is provided for general information only pertaining to the Service Display Module (SDM) as used with the TSC 80 transfer switch controller.

### 1.2. STATIC ELECTRICITY HANDLING PRECAUTIONS



#### CAUTION

contents subject to damage by  
STATIC ELECTRICITY

This equipment contains static-sensitive parts. Please observe the following anti-static precautions at all times when handling this equipment. Failure to observe these precautions may cause equipment failure and/or damage.

- Discharge body static charge before handling the equipment (contact a grounded surface and maintain contact while handling the equipment, a grounded wrist strap can/should also be utilized).
- Do not touch any components on the printed circuit board with your hands or any other conductive equipment.
- Do not place the equipment on or near materials such as Styrofoam, plastic and vinyl. Place the equipment on grounded surfaces and only use an anti-static bag for transporting the equipment.

## 2. DESCRIPTION

The SDM module is a hand-held service tool, which is designed exclusively for use on Thomson Technology Transfer Switches with TSC 80 Transfer Controllers. The SDM provides an LCD screen to display detailed information on the operation and settings of the TSC 80 controller for simplified servicing/troubleshooting procedures. The SDM module is for temporary use only while servicing procedures are undertaken and is not for permanent installation and use. The SDM module is designed only for use by trained service technicians who are qualified to service Thomson Technology Transfer Switches. For detailed information on the TSC 80 Transfer controller, refer to instruction manual (PM063).

The SDM module consists of a plastic enclosure which houses a LCD Display, Lexan faceplate with LED lights and operation pushbuttons as shown in FIGURE 1 below. The SDM is interconnected to a TSC 80 Transfer Controller via two ribbon cables, which are permanently attached to the SDM module.

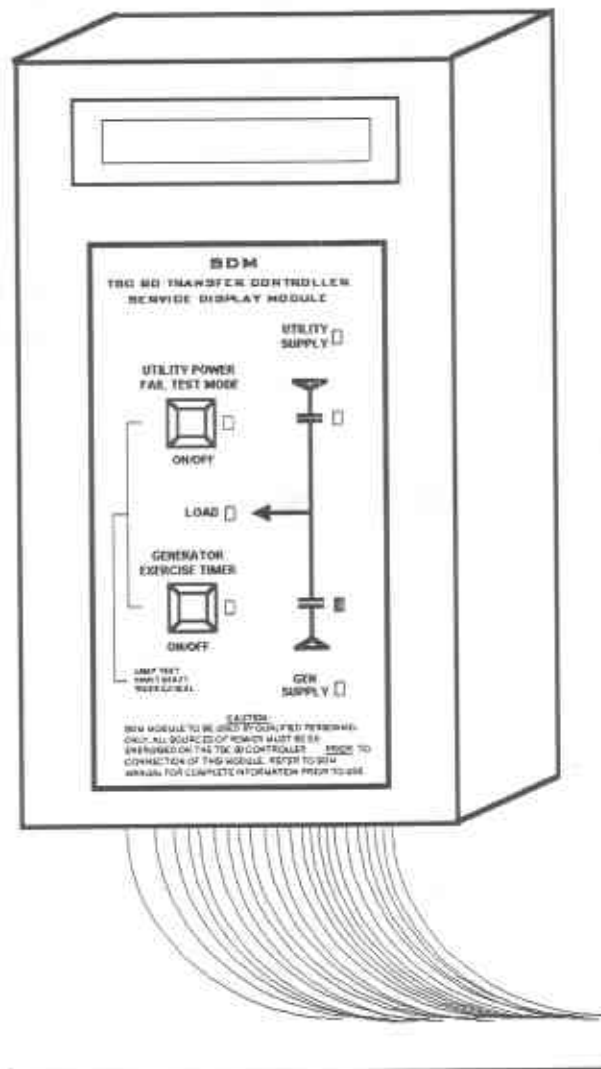


FIGURE 1-SDM MODULE

### 3. OPERATING INSTRUCTIONS

#### 3.1. SDM INSTALLATION

**CAUTION!!!**

*The SDM module must be installed and operated by qualified personnel only.  
Failure to do so may cause personal injury or death.*

To temporarily install the SDM module to a transfer switch with TSC 80 transfer controller for servicing procedures, follow the detailed procedure as outlined below:

1. De-energize all sources of power to the automatic transfer switch.
2. Disconnect the transfer switch control circuit isolation plug inside the transfer switch.
3. Remove the TSC 80 rear cover to gain access to the printed circuit board.
4. Disconnect the Lexan Faceplate interconnection cable to the TSC 80 controller (10 pin connector on JP3). Refer to FIGURE 2 for location of JP3.
5. Connect the SDM module ribbon cables as follows:
  - Connect the 12 pin (small) SDM ribbon cable to TSC 80 connector JP3. Refer to FIGURE 2 for location of JP3 and correct orientation. The ribbon cable has a "pink" paint marking which must be on the left hand side of the connection pins when viewed from the front of the circuit board.
  - Connect the 16 pin (large) SDM ribbon cable to TSC 80 connector J2. Refer to FIGURE 2 for location of J2 and correct orientation. The ribbon cable has a "pink" paint marking which must be on the left hand side of the connection pins when viewed from the front of the circuit board.
  - Note: For convenience, the SDM module may be attached to the door of the transfer switch using the magnetic strip on the rear of the module.
6. Re-connect the transfer switch control circuit isolation plug inside the transfer switch.
7. Once all ribbon cable connectors have been correctly installed and the transfer switch is safe to re-energize, restore normal power to the transfer switch.

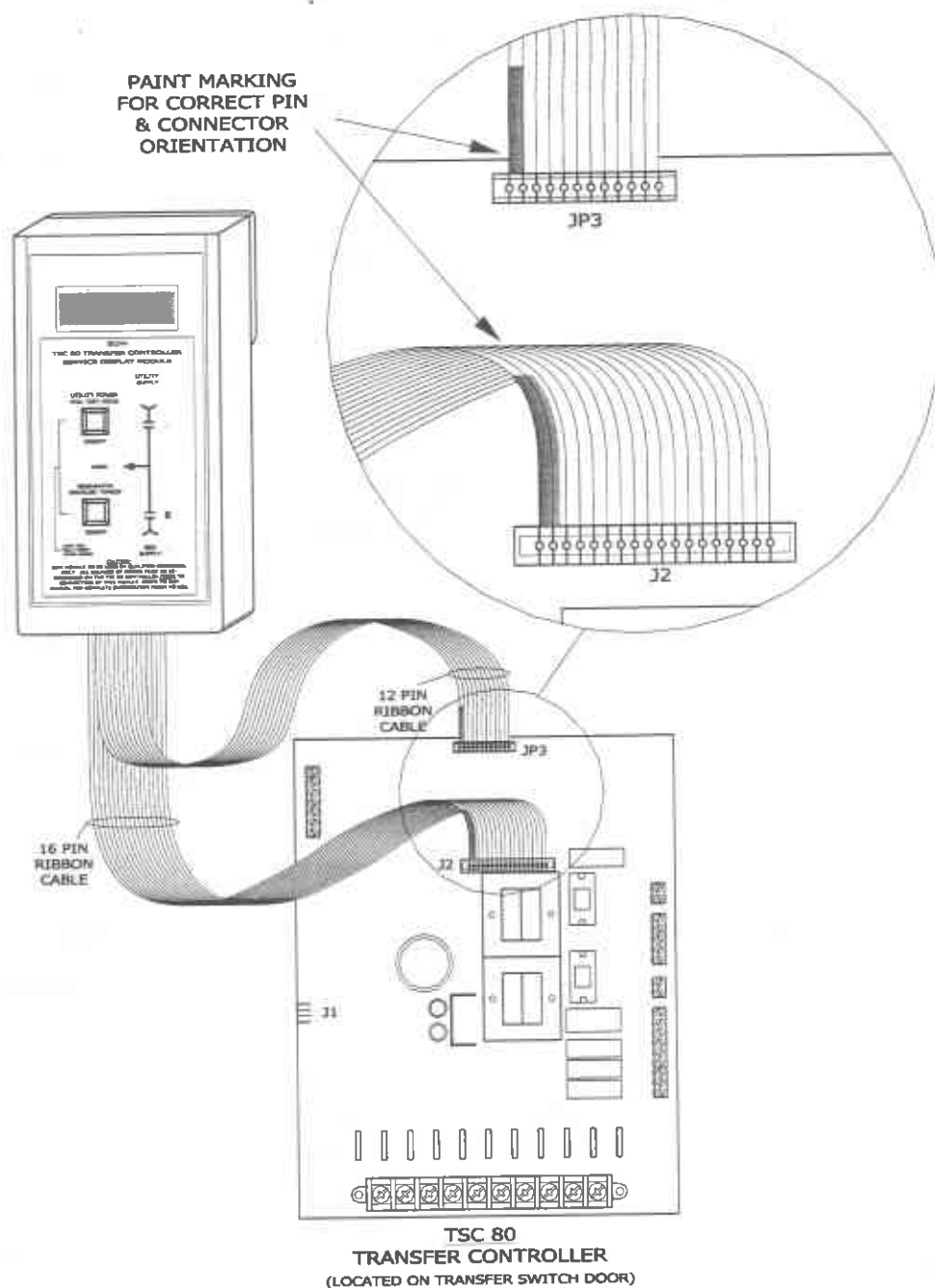


FIGURE 2-SDM/TSC 80 INTERCONNECTION DRAWING

### 3.2. DISCONNECTING SDM MODULE

**CAUTION!!!**

*The SDM module must be disconnected by qualified personnel only. Failure to do so may cause personal injury or death.*

To disconnect the SDM module, follow the detailed procedure as outlined below:

1. De-energize all sources of power to the automatic transfer switch.
2. Disconnect the transfer switch control circuit isolation plug inside the transfer switch.
3. Disconnect the 12 pin (small) SDM ribbon cable from the TSC 80 connector JP3. Refer to FIGURE 2 for location of JP3.
4. Re-connect the Lexan Faceplate interconnection cable to the TSC 80 controller (10 pin connector on JP3).
5. Disconnect the 16 pin (large) SDM ribbon cable from the TSC 80 connector J2. Refer to FIGURE 2 for location of J2.
6. Re-install the TSC 80 rear cover on to the TSC 80 controller.
7. Re-connect the transfer switch control circuit isolation plug inside the transfer switch.
8. Once all ribbon cable connectors have been correctly removed, restore normal power to the transfer switch.

### 3.3. SDM OPERATION

The SDM module receives control power whenever the TSC 80 controller is energized. The SDM module Lexan faceplate LEDs will reflect the current status of the connected power to the transfer switch. The SDM module Lexan faceplate pushbuttons provide identical operation of the transfer switch as the standard TSC 80 Lexan Faceplate. The SDM LCD will display 16 different operational status screens, which automatically scroll in a continuous loop.

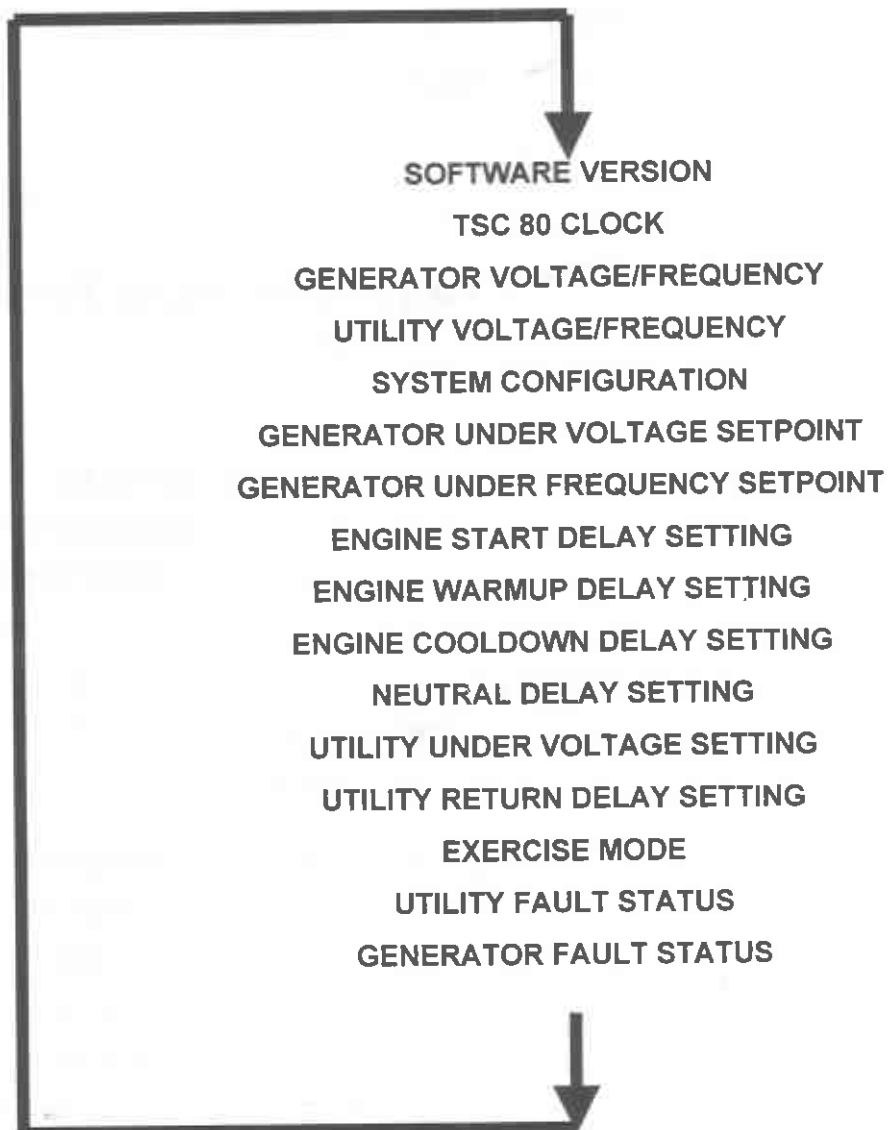
When an automatic timing function occurs on the TSC 80 controller, the SDM LCD will automatically display the active timer and the count down of the timing sequence. When the time period expires the SDM will automatically return to displaying the normal status screens.

**Note**

The SDM module cannot be used to change any program settings in the TSC 80 transfer controller. Program settings may only be monitored. All program changes must be done on the TSC 80 controller using the potentiometers & jumpers provided.

**3.3.1. LCD DISPLAY SCREENS**

The following sixteen (16) SDM Display Screens are provided:

**3.3.1.1. SOFTWARE VERSION**

The LCD screen shows the current version number of TSC 80 software loaded into the controller.

### **3.3.1.2.TSC 80 CLOCK**

The LCD screen shows the day and time, which the TSC 80 controller was programmed. The time clock function is not used in the operation of the transfer switch. Note: The time clock is not user adjustable.

### **3.3.1.3.GENERATOR VOLTAGE/FREQUENCY**

The LCD screen shows the current generator voltage (3 phase or single phase, line– to – line or line to neutral voltages) and frequency.

### **3.3.1.4.UTILITY VOLTAGE/FREQUENCY**

The LCD screen shows the current utility voltage (3 phase or single phase, line– to – line or line to neutral voltages) and frequency.

### **3.3.1.5.SYSTEM CONFIGURATION**

The LCD screen shows the current setting of the TSC 80 programming jumpers:

- SYSTEM NOMINAL VOLTAGE (120, 208, 240, 380, 480, 600V)
- SYSTEM NOMINAL FREQUENCY (50, 60Hz)
- SYSTEM PHASES (single or 3 phase)

### **3.3.1.6.GENERATOR UNDER VOLTAGE SETPOINT**

The LCD screen shows the current generator voltage applied and the generator under voltage sensor drop-out % setpoint as programmed in the TSC 80 controller. The SDM module can be used to monitor a change in setpoint while the under voltage sensor is adjusted via the GEN UV potentiometer on the TSC 80 controller. For further information on the under voltage setpoint, refer to *Section 4* of the TSC 80 instruction manual.

### **3.3.1.7.GENERATOR UNDER FREQUENCY SETPOINT**

The LCD screen shows the current generator frequency applied and generator under frequency sensor drop-out % setpoint as programmed in the TSC 80 controller. The SDM module can be used to monitor a change in setpoint while the under frequency sensor is adjusted via the GEN FREQ potentiometer on the TSC 80 controller. For further information on the under frequency setpoint, refer to *Section 4* of the TSC 80 instruction manual.

### **3.3.1.8.ENGINE START DELAY SETTING**

The LCD screen shows the Engine Start Delay timer setting as programmed in the TSC 80 controller. The SDM module can be used to monitor a change in

setpoint while the Engine Start Delay timer is adjusted via the GEN START potentiometer on the TSC 80 controller. For further information on the Engine Start Delay timer, refer to *Section 4* of the TSC 80 instruction manual.

#### **3.3.1.9.ENGINE WARMUP DELAY SETTING**

The LCD screen shows the Engine Warmup Delay timer setting as programmed in the TSC 80 controller. The SDM module can be used to monitor a change in setpoint while the Engine Warmup Delay timer is adjusted via the GEN WARM potentiometer on the TSC 80 controller. For further information on Engine Warmup Delay timer, refer to *Section 4* of the TSC 80 instruction manual.

#### **3.3.1.10.ENGINE COOLDOWN DELAY SETTING**

The LCD screen shows the Engine Cooldown Delay timer setting as programmed in the TSC 80 controller. The SDM module can be used to monitor a change in setpoint while the Engine Cooldown Delay timer is adjusted via the GEN COOL potentiometer on the TSC 80 controller. For further information on Engine Cooldown Delay timer, refer to *Section 4* of the TSC 80 instruction manual.

#### **3.3.1.11.NEUTRAL DELAY SETTING**

The LCD screen shows the Neutral Delay timer setting as programmed in the TSC 80 controller. The SDM module can be used to monitor a change in setpoint while the Neutral Delay timer is adjusted via the NEUT DLY potentiometer on the TSC 80 controller. For further information on Neutral Delay timer, refer to *Section 4* of the TSC 80 instruction manual.

#### **3.3.1.12.UTILITY UNDER VOLTAGE SETTING**

The LCD screen shows the current utility voltage applied and utility under voltage sensor drop-out % setpoint as programmed in the TSC 80 controller. The SDM module can be used to monitor a change in setpoint while the under voltage sensor is adjusted via the UTIL UV potentiometer on the TSC 80 controller. For further information on the under voltage setpoint, refer to *Section 4* of the TSC 80 instruction manual.

#### **3.3.1.13.UTILITY RETURN DELAY SETTING**

The LCD screen shows the Utility Return timer setting as programmed in the TSC 80 controller. The SDM module can be used to monitor a change in setpoint while the Utility Return timer is adjusted via the UTIL RTN

potentiometer on the TSC 80 controller. For further information on Neutral Delay timer, refer to *Section 4* of the TSC 80 instruction manual.

#### **3.3.1.14. EXERCISE MODE**

The LCD screen shows if the Auto Exercise mode is currently enabled or disabled. When it is enabled, the remaining time to test is displayed.

For further information on Exercise mode operation, refer to *Section 4* of the TSC 80 instruction manual.

#### **3.3.1.15. UTILITY FAULT STATUS**

The LCD screen shows the current status of the Utility Supply. The following different statuses will be displayed:

- Normal
- Utility Limit Switch Fail
- Utility Switching Device Failed

For further information on the transfer failure modes, refer to *Section 3* of the TSC 80 instruction manual.

#### **3.3.1.16. GENERATOR FAULT STATUS**

The LCD screen shows the current status of the Generator Supply. The following different statuses will be displayed:

- Normal
- Gen Limit Switch Fail
- Gen Switching Device Failed

For further information on the transfer failure modes, refer to *Section 3* of the TSC 80 instruction manual.

### **3.3.2. SDM OPERATION PUSHBUTTONS**

The Lexan faceplate contains 2 pushbuttons (i.e. UTILITY POWER FAIL TEST Mode & GENERATOR EXERCISE TIMER), which can be used for the following operational functions:

- SDM LCD Display Auto Scroll Halt: The automatic scrolling feature can be halted by pressing and holding the UTILITY POWER FAIL pushbutton for approximately 3 seconds. The display will remain at the screen that was displayed when the pushbutton was activated for 255 seconds, and then it will return to the auto scroll mode.

- ❑ **Manual Advance & Lock-on to Next LCD Display Screen:** To manually advance the LCD to the next screen, press and hold the UTILITY POWER FAIL pushbutton for approximately 1 second until the screen changes. **Note:** The LCD display will return to the automatic scrolling mode in 255 seconds if no other pushbuttons are used. **Note:** For quick advancement to the next display screen, momentarily press the UTILITY POWER FAIL pushbutton until the screen changes.
- ❑ **Manual Return & Lock-on to Previous LCD Display Screen:** To manually return to the previous LCD screen, press and hold the GENERATOR EXERCISE pushbutton for approximately 1 second until the screen changes. **Note:** The LCD display will return to the automatic scrolling mode in 255 seconds if no other pushbuttons are used. **Note:** For quick advancement to the previous display screen, momentarily press the GENERATOR EXERCISE pushbutton until the screen changes.
- ❑ **Timer Bypass:** Both Lexan faceplate pushbuttons must be held on for approximately 5 seconds until the displayed timer resets to zero.
- ❑ **Transfer Fail Reset:** Both Lexan faceplate pushbuttons must be held on until all LEDs on the Lexan illuminate in a flashing mode.
- ❑ **Lamp Test:** Both Lexan faceplate pushbuttons must be held on longer than 5 seconds until all LEDs on the Lexan illuminate in a flashing mode.
- ❑ **Initiate a Load Transfer to Generator** (push & hold the UTILITY POWER FAIL TEST Mode for 5 seconds until the LED light changes state).
- ❑ **Initiate a Generator Exercise Mode** (push & hold the GENERATOR EXERCISE TIMER Mode for 5 seconds until the LED light changes state).

**Note**

The SDM module pushbuttons cannot be used to change any program settings in the TSC 80 transfer controller. Program settings may only be monitored. All program changes must be done on the TSC 80 controller using the potentiometers & jumpers provided.

## 4. TROUBLESHOOTING

A number of problems can cause the SDM module not to function properly. Refer to the following list of typical problems. Consult Thomson Technology for further information or for any problems not listed.

### **CAUTION!!!**

***Before opening the Transfer Switch enclosure to perform any service task, it is imperative to isolate the transfer switch from any possible source of power. Failure to do so may result in serious personal injury or death due to electrical shock.***

Service procedures must be undertaken by qualified personnel only!

#### **Symptom**

- SDM will not display any information while the TSC 80 controller is energized.
  
- SDM Lexan faceplate LED's and/or pushbuttons are inoperative.

#### **Possible Causes**

- Defective TSC 80 controller (verify TSC 80 is energized and is operating correctly-Check for flashing SYS OK green LED on the TSC 80 printed circuit board).
- LCD communication signal may need to be re-initialized. Remove jumper JP9 on the TSC 80 controller for 5 seconds and re-install.
- A loose ribbon cable connection
- Misalignment of TSC 80 pins & ribbon cable
- Ribbon cable for 16 pin connector is backwards. Refer to FIGURE 2 for correct orientation.
  
- Defective TSC 80 controller (verify TSC 80 is energized and is operating correctly-check for flashing SYS OK green LED on the TSC 80 printed circuit board).
- A loose ribbon cable connection
- Misalignment of TSC 80 pins & ribbon cable
- Ribbon cable for 12 pin connector is backwards. Refer to FIGURE 2 for correct orientation.

#### **Note**

There are no user serviceable components located on the TSC 80 printed circuit board or SDM module. If the TSC 80 controller or SDM module is deemed to be defective they must be returned to the Thomson Technology Factory for repair or replacement. Please refer to *Section 5* for further detailed on product return procedures required.

## 5. PRODUCT RETURN POLICY

Thomson Technology uses a Return Material Authorization (RMA) process. Please complete the Return Authorization Request Form (available on our web page) for return of goods, warranty replacement/repair of defective parts, or credit consideration and fax to the appropriate department.

Returns only: Send to Sales department Fax number (604) 888-5606.

Warranty Replacement/Warranty Repair: Send to Service department Fax number (604) 888-3370.

Upon receipt of your request, Thomson Technology will confirm with a copy of our Order Acknowledgement via fax advising the RMA number which should be used to tag the defective controller or SDM module prior to shipment.

