



# OPERATING AND PROGRAMMING MANUAL



## **10942B Version 2.0**

### Coaxial Four-Channel IF Backup System

*State-of-the-Art Switching Solutions*

## Warranty

This **Universal Switching Corporation** product is warranted against manufacturing defects, and workmanship for a period of two years from the date of shipment from our factory. During this period, Universal Switching will, at its option, either repair or replace products which prove to be defective or out of specification per the original purchase order or contract. Damage by misuse or abnormal conditions of operation, or evidence of partial or complete disassembly beyond normal maintenance or expansion procedures voids this warranty. Since Universal Switching Corporation has no control over conditions of use for the products it manufactures, no warranty is made or implied as to the suitability for the customer's intended use, beyond such performance specifications as are made a part of the purchase order or contract.

Equipment shipped F.O.B. Universal Switching Corporation shall become the property of the Buyer upon delivery to the carrier. Equipment shipped F.O.B. Destination shall become the property of the Buyer upon delivery acceptance from the carrier. Damage during shipment, for items shipped F.O.B. Universal Switching Corporation should be handled by immediately requesting the carrier's inspection upon evidence of damage to the equipment. This warranty excludes all other warranties expressed or implied. Universal Switching Corporation shall not be liable for any special, indirect, or consequential damages.

For warranty service or repair, the Buyer shall prepay shipping charges to Universal Switching Corporation, and Universal Switching Corporation shall pay shipping charges to return the product to the Buyer. However, Buyer shall pay all shipping charges, duties, and taxes for products returned to Universal Switching Corporation from another country.

Universal Switching Corporation warrants that its software and firmware designated by Universal Switching Corporation for use with an instrument will execute its programming instructions when properly installed on that instrument. Universal Switching Corporation does not warrant that the operation of the instrument, or software, or firmware will be uninterrupted or error-free.

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**TECHNICAL SUPPORT**

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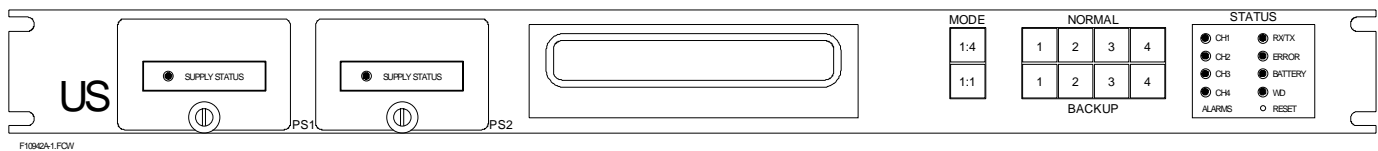
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# 1. Introduction to the System 10942B

The system 10942B is a highly integrated coaxial switching system specially configured for routing IF signals in a four-channel backup arrangement. Under remote program or front panel control, the user may connect a backup source in place of the four standard signal inputs.

The 10942B is designed for high performance analog signal switching and incorporates ultra-high reliability relay-based switching elements. The wide bandwidth (DC-500MHz) makes the 10942B a very versatile switch for connecting numerous backup signals to digital or analog feeds, all under remote or local control.



It is design for high reliability and high performance utilizing the latest in component technology. Front panel accessible and hot-swap redundant power supplies are included to provide for zero down time in the event of a power supply failure.

*Some of the key features are:*

- Wide analog bandwidth
- Hot-Swap power supplies
- Ultra high reliability relay switching elements
- Embedded intelligent controller
- Front panel status LED's
- Vacuum fluorescent display (1x20)
- Illuminated control keys and display
- Powerful control command set
- Store and recall switching configurations
- Standard serial interfaces
- International AC power input (90-264VAC), DC versions available
- Compact and rugged enclosure design
- Flash field programmable

## 1.1. Versions

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The System 10942B is available in different versions depending upon the user's need. The unit is ordered pre-configured with one type of serial port, but can be easily changed to a different type by moving serial configuration jumpers under the cover. The predecessor (10942A) did not have this flexibility.

Also, the unit can be ordered to operate from either AC (90-264VAC) or from DC voltages, plus it is available in either 75 ohm (standard) or 50 ohm versions. These cannot be changed in the field.

## 1.2. System Expansion

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As previously expressed in the warranty notice, Universal Switching Corporation voids the warranty of this system, if it has been damaged by misuse or abnormal conditions of operation, or evidence of partial or complete disassembly beyond normal maintenance or expansion procedures.

The system is a factory pre-configured system that can not be modified or expanded by simply populating it with additional modules when empty slots are available in the rack-mounted mainframe. The modification or expansion of the system requires a firmware upgrade to address and control the additional hardware installed.

The series G2 product line provides enhanced control, additional features, higher performance, and greater system flexibility than ever before; however, if you need to modify or expand your system please consult our application engineers for further assistance.

***CAUTION: The system is configured with a particular power supply that is not interchangeable with other models. Always replace the power supply with the same model number. Failure to observe this CAUTION could result in damage to equipment.***

## 2. System Setup

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This section contains safety warnings and instruction on how to configure the switching system in preparation for operation.

It is very important to read and follow carefully the instructions provided below to assure safe and trouble-free operation and also to maximize the performance and expected lifetime of the system.

### 2.1. Preventing Electrostatic Discharges (ESD)

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Many electronic components inside the system contain microcircuits and other sensitive devices that can be damaged internally by electrostatic discharges (ESD).

Electrostatic discharges (ESD) are the most severe form of electromagnetic interference. The human body can build up static charges that range up to many thousands of volts. These voltages can discharge very rapidly into an electrically grounded body or device. Damage to the internal components of a sensitive device can cause failure with just one static discharge.

The most common causes of ESD are the human body, low humidity, improper grounding, unshielded cables, and poor connections.

#### 2.1.1. Anti-Static Protection

*The components inside the switching system are extremely sensitive to electrostatic discharge (ESD). Electrostatic discharge can cause irreparable damage to the internal components of the switching system. The technician handling the component must know about static electricity and how to protect the components from ESD.*



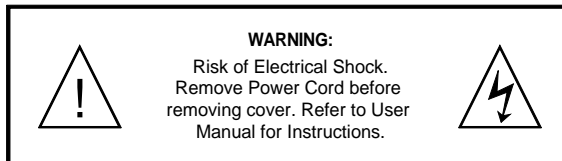
**NOTE: Please follow normal ESD precautions and use anti-static protection to minimize or eliminate possible damage to the sensitive components included with the system.**

## 2.2. Safety Warnings and Markings









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The switching system has been designed and tested to meet strict safety requirements. Two European union (EU) approved power cords that meet the Conformité Européen (CE) requirements are included with the system. If the switching system is utilizing a system's integrator, the integrator may be responsible for the correct AC power cord specific for the destination country.

The system contains high voltage hazardous to human life and safety, and is capable of inflicting personal injury. The following warning marking is visible on the outside of the system. Note that this marking should never be removed and must remain on the system at all times.



The following IEC symbols are utilized as appropriate throughout the unit. This table can be used as a reference.

	<b>Meaning of Symbols</b>	<b>IEC Symbol Reference</b>
	High Voltage: Risk of Electric Shock	ISO 3864, No. 3.3.1 and 5036
	Explanation Needed: Refer to this Operations Manual	ISO 3864, No. 3.3.1
	AC Voltage	5032
	Switch ON	5007
	Switch OFF	5008
	ON/OFF (alternate action with Push-ON, Push-OFF)	5010
	ON/OFF (alternate action with Push-ON, Push-OFF)	5016
	Protective Earth Ground	5019

## 2.3. Serial Number Label

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The Model 10942B includes a factory assigned serial number that is unique to each piece of equipment. Since the 10942B is available in three standard configurations, there is also a label on the bottom of the unit indicating the version of the 10942B. The three different 10942B varieties are identical with exception of the serial control ports located on the rear of the unit.

## 2.4. Unpacking

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The system is packed in antistatic material and shipped in multiple cartons of custom commercial packaging. Please pay attention when opening the shipping container to not inflict any cosmetic damage to the system. Check the packing list against the contents of the shipping container.



***NOTE: Carefully inspect the packaging for shipping damage and if present, immediately notify Universal Switching Corporation and the carrier. Keep all shipping materials for the carrier's inspection.***

If the contents are not complete, or there is any kind of mechanical damage or visible defects, you must notify the factory within five (5) days of receipt.

## 2.5. Environmental

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The system 10942B operates in a normal laboratory, production, or a more rugged industrial environment without any additional considerations. Protection should be provided against temperature extremes (shock) which can cause condensation.

### 2.5.1. Storage and Shipping

The System 10942B may be stored or shipped in environments with the following limitations:

- Temperature: -20 degrees C to +85 degrees C
- Humidity: 0 to 90% (non-condensing)
- Altitude: 50,000 feet

### 2.5.2. Operating Environment

The System 10942B may be used in any environment with the following limitations:

- Temperature: 0 degrees C to +60 degrees C
- Humidity: 0 to 90% (non-condensing)

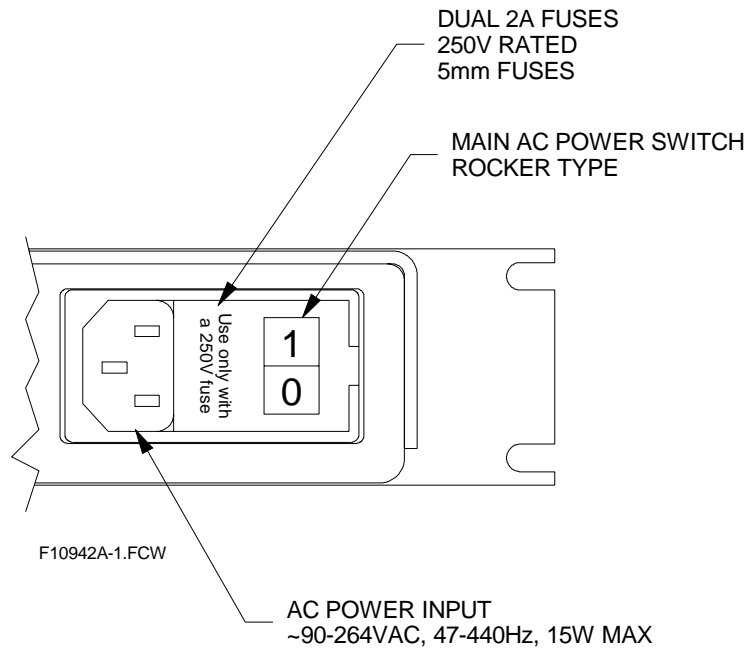
### 2.5.3. Installation Site Parameters

The area that the System 10942B is to be installed should be as clean as possible. A dusty environment should be avoided. It is suggested that the system be installed in an environmentally controlled area equipped with an air filtration system.

The system has been designed to be installed in a standard 19" equipment rack. The system is 1RU high (1.72"). All I/O and control signal connections to the system are at the rear, and therefore would come from inside the rack enclosure.

### 2.5.4. Power Requirements (AC Version)

The System 10942B (AC version) requires a power source of 90 to 264VAC single phase, 47 to 440Hz, and consumes <10 Watts of power. A 6-foot long power cord with a standard NEMA 15A male plug is included with the system. For high reliability, front panel installed redundant hot-swap power supplies are utilized.



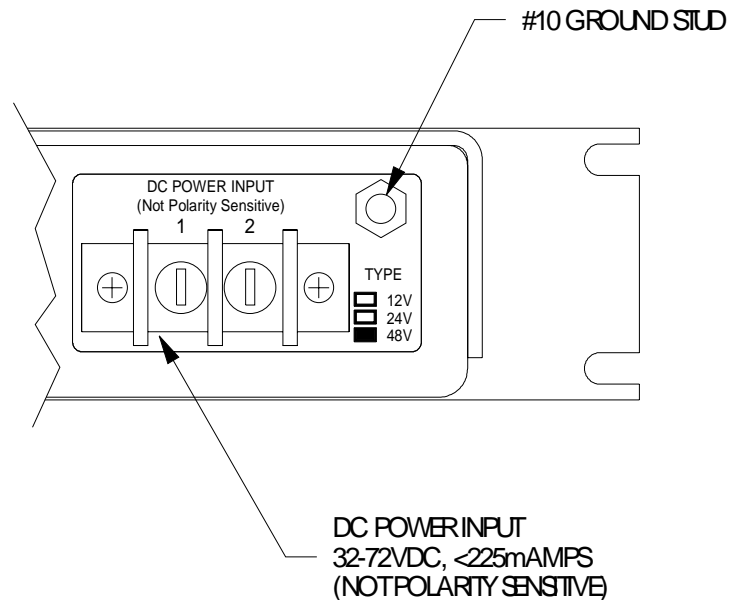
### 2.5.5. Connecting AC Power

The System 10942B is Safety Class 1 type equipment (equipment with an exposed metal chassis that is connected to earth via the power supply cord). Included with the 10942B is a EU approved power cord matched to meet CE requirements.

Depending on if a system integrator is utilizing this unit, the system integrator may be responsible for the correct AC power cord specific for the destination country. The power receptacle on the rear of the drawer is mated by the supplied 6-foot three-wire power cord providing the required grounding of the unit. A line filter is also included in the power section to help eliminate spikes and transients from the AC power source.

## 2.5.6. Power Requirements (48VDC version)

The System 10942B (DC version) requires a power source of 48 Volts DC (32-72V range), and consumes <10W of power. For high reliability, front panel installed redundant hot-swap power supplies are utilized. Other input voltage ranges are available. The 48 volt version is identified by the appropriate voltage box adjacent to the input connector. Contact the factory for additional ranges.



### 2.5.6.1. Connecting DC Power

DC power is supplied to the unit using the rear panel mounted screw terminals. The two terminals are marked "1" and "2", respectively, but any polarity may be used, since the 10942B is equipped with an input rectifier. A ground terminal is also provided.

## 2.6. Shipment of the System

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If any portion of the System is to be shipped back to the factory for service or modification, please attach a tag to the system. This tag must identify the current owner (including address and phone number) model and serial number of the unit, as well as a brief description or the required service or suspected problem.

Mark the container **FRAGILE** to help insure safe handling by the carrier. In correspondence, refer to the return item by the model number and serial number.



**NOTE: Many problems may be solved over the phone. If system return is required, please call the factory for an RMA number prior to returning the unit. No unit shall be accepted without an RMA number.**

### 2.6.1. Return Address

When returning the unit for repair or service, please use the following address:

**Universal Switching Corporation**  
7671 North San Fernando Road  
Burbank, CA 91505-1073 USA

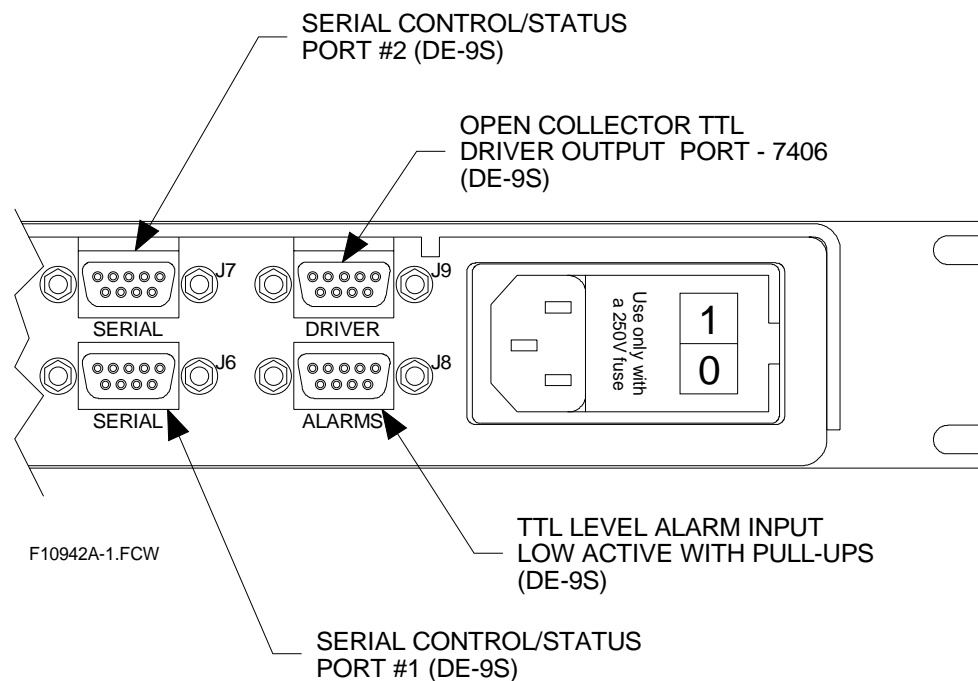


**NOTE: For additional information, visit our website at [www.uswi.com](http://www.uswi.com)**

## 2.7. Connecting the Serial Interface

The System 10942B is available with three (3) different types of dual serial control ports. The suffix of the model number defines the type of factory installed serial interface. The serial interface connectors are located on the rear of the unit and are a standard D-Type 9-position female connector. Mating connectors are not supplied with the unit (DE-9P).

Model Number	Serial Interface Type
10942B-D232	Dual RS-232C Ports
10942B-D422	Dual RS-422A Ports
10942B-D485	Dual RS-485 Multi-Drop Ports

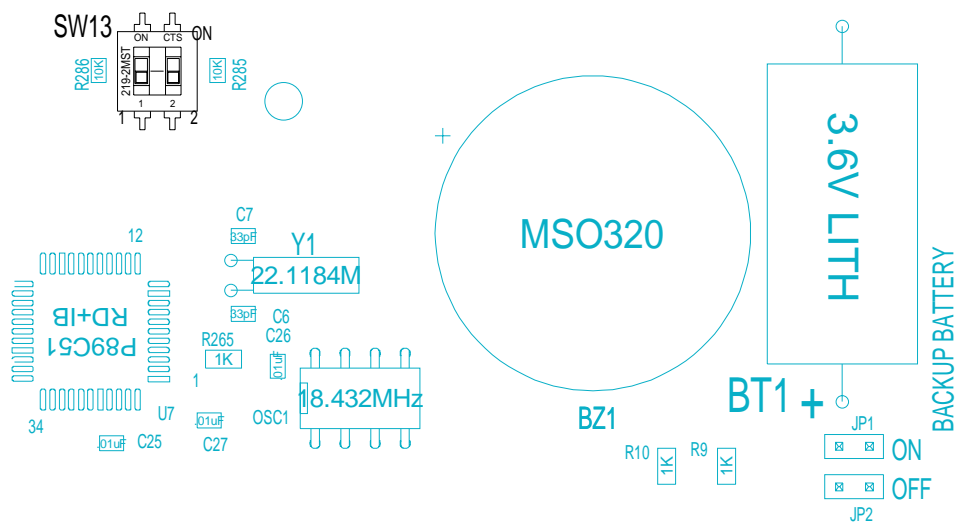


No matter the type of serial interface port, the port default configured at the factory for **9600 Baud, 8 Data bits, 1 Start Bit, 2 Stop Bits, No Parity, and no flow control**. In the case of the RS-485 multi-drop (addressable interface), the factory default address is ten (10). Changes to these settings are explained in the following sections.

### 2.7.1. Configuring the Serial Port(s) Hardware

The interface type, RS-232 / RS-422 / RS-485, is pre-configured at the factory to the type specified by the original Model number. However, if requirements change, it is possible to reconfigure one or both serial ports for a different hardware interface type. This is done by moving jumpers and dipswitches located inside the unit as described below.

#### FRONT OF UNIT



SW13 contains two (2) switches and is located near the front panel. The switch position of SW13 determines whether an “address byte” is required to precede each command.

SW13-1 controls port 1 (J6); SW13-2 controls port 2 (J7).

For RS-485, SW13 must be in the “ON” position.

For RS-232 and RS-422, SW13 must be in the “OFF” position.









































































































