

General

Many large scale communication installations require redundancy equipment and systems. The 10946B provides the systems professional with an uncompromising combination of high performance and high reliability switching elements coupled together for DC-6GHz performance. With hot-swap redundant power supplies and redundant system control ports, the 10946B delivers the ultimate in system reliability for critical applications.

Compact and high performance, the Model 10946B provides cost effective, flexible switching capacity for smaller installations, providing 4 channels of redundancy switching (A/B primary or backup). It also provides both 1:1 or 1:4 modes. The 1:1 mode provides individual control of each transfer relay while the 1:4 mode controls all four transfer sections at the same time as a group.

Complete control and status of the unit is available at both the front panel controls or the dual remote interface. Also provided with the unit is a direct TTL alarm input connector for direct channel selection and an 8-bit driver port for controlling external devices. The unit is available with dual serial ports with provision for the user to self-configure the serial mode of the individual ports (RS-232C, RS-422A or RS-485), or also available with a single serial port plus Ethernet (10/100BaseT).

NOTE: If additional frequency range is needed, try the Model 10948B rated to 18GHz.

Applications

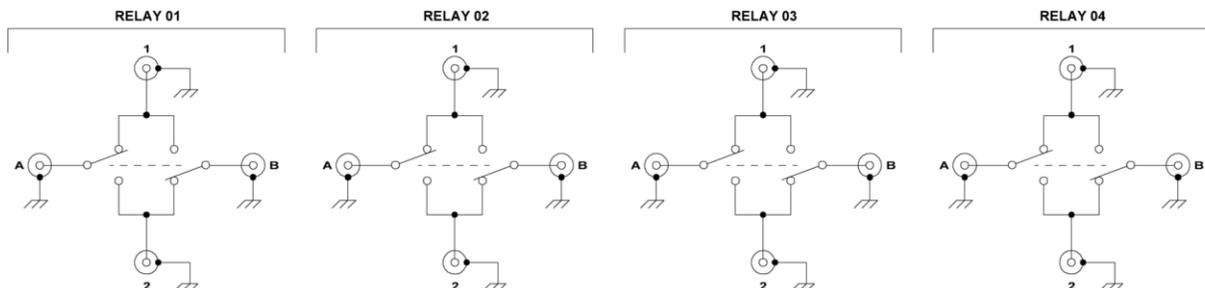
- Communication installations
- Airborne surveillance systems
- Digital broadcast facilities or production studios
- Imaging and animation production facilities
- Antenna routing for transmit or receive
- Security or remote systems control
- Site automation monitoring

Features

- High reliability relays
- Four channels of A/B backup switching
- Dual mode, 1:4 or 1:1 included
- DC-6GHz bandpass switching
- SMA signal connectors
- Redundant hot-swap power supplies
- Dual serial control ports plus, or Ethernet & one serial
- Field configurable serial ports (RS-232C/422A/485)
- International AC power input
- Certified CE EN61010 (LVD)
- LabVIEW drivers available
- TTL alarm inputs port and programmable driver output



Signal Diagram



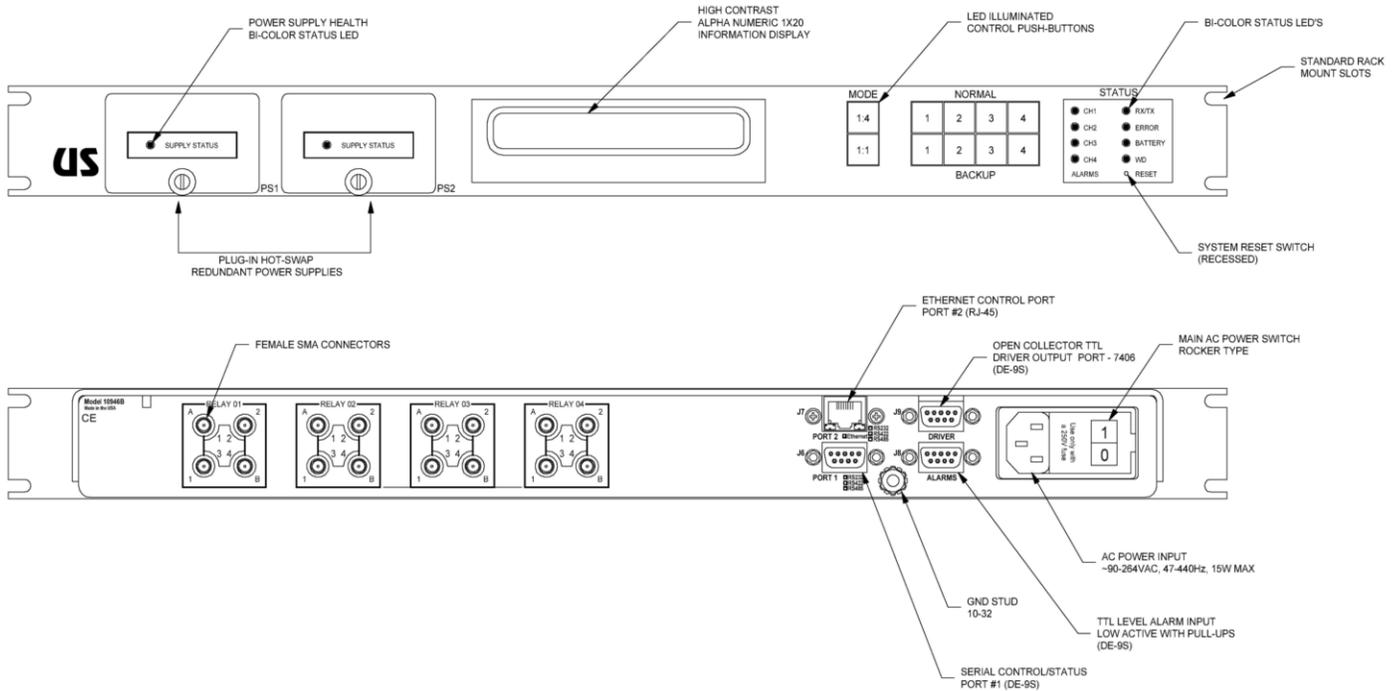
Front Panel Features

The front of the unit provides a host of features in a compact panel height. Channel selection and the back-up mode (1:1 or 1:4) can be controlled here by front panel color-coded LED illuminated control keys. A high contrast vacuum fluorescent display also displays status and control messages.

For easy access, front panel installed redundant hot-swap power supplies are included. These supplies are constantly

monitored by the unit for proper operation and installation. Bi-color LED's on each supply can easily identify a defective power supply unit.

Bi-color status LED's are integrated at the front panel. These are for the J8 alarm input port, serial receive and transmit activity, lithium battery monitor, and general error conditions. Errors are displayed on the front panel display, and an error code is also sent via the serial ports.



Serial Port Type

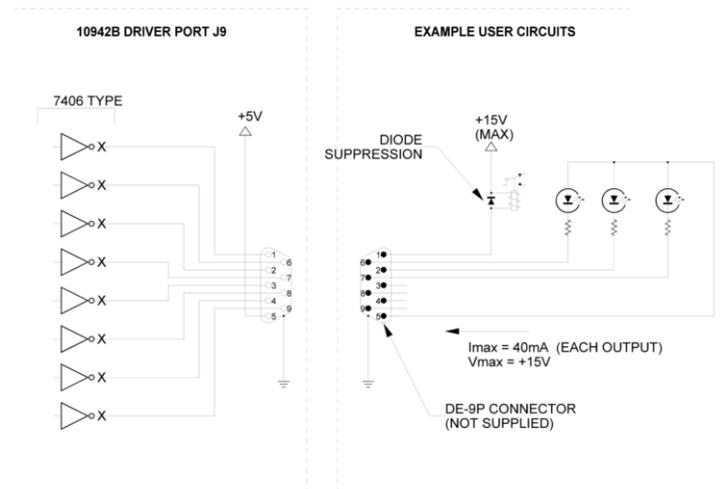
The unit is delivered with dual RS-232C, RS-422A or RS-485 serial interfaces installed. The unit is factory configured for RS-485. The user can change the serial configuration by simply removing the cover and changing the configuration jumpers. Either or both supplied serial ports can be used to control and monitor the unit. Data to the ports is serviced on a first-come, first-served basis. Many operating parameters of the unit, such as baud rate, can be modified via the serial ports. See back page on Command Protocol for more detail.

8-Bit Driver Port

The 10946B includes an 8-Bit open-collector driver output port (J9) that the user can write to via either of the serial interface ports. The output can be used to drive user indicators or other equipment.

Alarm Input Port

A direct alarm input port (J8) is provided for TTL compatible control of the units four channels. Four active-low inputs allow the user to select the back-up mode for the associated input port.



High Performance Transfer Sections Model 10946B

Four Channel System

The Model 10946B backup A/B selector system offers a high performance, low cost solution to your back-up switching needs providing a total of four channels of backup switching (A1-B2, or A2-B1). An additional capability provides flexibility so the unit may be configured for either 1:1 switching (individual transfer relay control), **or** 1:4 switching where all four transfer relays are gang-controlled together. The switching mode is selectable from either the front panel controls or the remote interface.

Control options and switching configurations are stored in non-volatile memory (lithium-backed RAM). Under power up procedures, the unit may be set to recall the last configuration since power down, or to completely clear all crosspoint connections. If main power is lost to the unit, all sections fall back to the "A1-B2" connection position until main power is again restored.

Model Number Assignment

The 10946B is available in six standard configurations. The model number specifies the "shipped" serial interface factory configured (can be changed in the field).

| | <u>Model Number</u> | <u>Interface</u> | <u>Capability</u> | <u>Conn</u> |
|---|---------------------|-------------------|-------------------|-------------|
| ■ | 10946B-D485 | Dual Serial | 1:1 & 1:4 | SMA-50 |
| ■ | 10946B-SE10 | Ethernet & Serial | 1:1 & 1:4 | SMA-50 |

NOTE 1: The unit is shipped configured for RS-485 and can be easily changed via configuration jumpers under the top cover if control needs change.

NOTE 2: Adding a "-T" suffix will include a precision 50 ohm termination on all four "B" ports to provide a quad self-terminating 2x1 relay configuration.



DC Powered Option

The 10946B may also be ordered so it can be powered by DC voltage instead of by a normal 90-264VAC power source. The rear panel power connection includes a two position screw terminal and a chassis ground stud. Contact the factory for more information.

| Suffix | DC Input Range | Max Current |
|--------|----------------|-------------|
| -4 | 36-75VDC | 1.50A |
| -2 | 18-36VDC | 2.20A |
| -1 | 9-18VDC | 3.75A |

Command Protocol

The control command protocol for the 10946B is simple and streamlined, yet powerful and comprehensive for a switch of its size. All commands are standard ASCII strings, and must be terminated with a <CR>. The "x"s below represent digits specific to the command. The following commands are available:

| | |
|-------|---|
| Bx | Connect a backup port to an output port (backup) |
| Nx | Disconnect a backup port from an output port (normal) |
| Vx | Verify the status of a backup connection |
| Sxx | Store switching configuration |
| Rxx | Recall switching configuration |
| CLR | Clear all backup connections |
| Pxxxx | Set backup priorities for the 1:4 mode |
| Hx | Set backup mode (1:1 or 1:4) |
| DL | Download switch configuration |
| RST | Reset the system to default |
| ER? | Error status request |
| VER | Request for firmware version |
| SON | Enables unsolicited error attention message "ER!" |
| SOF | Disables unsolicited error attention message "ER!" |
| Ixx | Sets the baud rate of the serial communication port |
| LCK | Locks the front panel controls |
| UNL | Unlocks the front panel controls |
| BPx | Controls conditions for internal beeper usage |
| RON | Enables the system AutoRestore mode |
| ROF | Disables the system AutoRestore mode |
| Axx | Changes the factory default RS-485 address |
| Oxxx | Outputs to the TTL driver port binary equivalent of "xxx" |

Version 1.01 Firmware

Units with firmware version 1.01 (or higher), also has a third command mode added; 2:2 mode or "H2". In this mode, commands to ports 1 and 2 will actuate ports 1 and 3, or 2 and 4 (respectively) in a ganged fashion. See the manual for additional information.

Serial Pin Assignment

RS-232C

| Pin | Function | Designation |
|-----|----------------|-------------|
| 1 | .Not Used | |
| 2 | .Transmit Data | TXD |
| 3 | .Receive Data | RXD |
| 4 | .Not Used | |
| 5 | .Signal Ground | GND |
| 6 | .Not Used | |
| 7 | .Clear To Send | CTS |
| 8 | .Ready To Send | RTS |
| 9 | .Not Used | |

RS-422A

| Pin | Function | Designation |
|-----|--------------------|-------------|
| 1 | .Transmit Data (-) | TXD - |
| 2 | .Transmit Data (+) | TXD + |
| 3 | .Receive Data (+) | RXD + |
| 4 | .Receive Data (-) | RXD - |
| 5 | .Signal Ground | GND |
| 6 | .Clear To Send (-) | CTS - |
| 7 | .Clear To Send (+) | CTS + |
| 8 | .Ready To Send (+) | RTS + |
| 9 | .Ready To Send (-) | RTS - |

RS-485 Multidrop

| Pin | Function | Designation |
|-----|----------------|-------------|
| 1 | .TR Data (-) | 485 - |
| 2 | .TR Data (+) | 485 + |
| 3 | .Not Used | |
| 4 | .Not Used | |
| 5 | .Signal Ground | GND |
| 6 | .Not Used | |
| 7 | .Not Used | |
| 8 | .Not Used | |
| 9 | .Not Used | |

Model 10946B Specifications

| | |
|---------------------------|----------------------------------|
| Array size | .Four A/B transfer channels |
| Switching mode | .1:1 or 1:4 backup capacity |
| Switching elements | .High reliability relays |
| Type of system | .A/B backup or transfer selector |
| Architecture | .Fixed size |
| Termination | .None |
| Signal connector location | .Rear panel |

I/O Characteristics

| | |
|----------------------|-----------------------|
| Impedance | .50 ohm |
| VSWR loss (1:1 mode) | .<1.3:1 @ 6GHz |
| Signal connector | .SMA female |
| Coupling | .DC |
| Power capacity | .60W @ 6GHz (average) |

Signal Characteristics

| | |
|-------------------|------------------------|
| Transmission loss | .<0.20dB @ 2GHz |
| | .<0.30dB @ 6GHz |
| Isolation | .>80dB @ 4GHz |
| | .>70dB @ 6GHz |
| Signal path | .Passive bidirectional |

General Specifications

| | |
|------------------------------|--|
| Switching speed | .<20ms |
| Power supply section | .Hot-Swap redundant supplies |
| Power supply monitoring | .Included |
| Remote control interfaces | .Serial (RS-232C, RS-422A or RS-485 multidrop) |
| Ethernet port | .10/100BaseT |
| Serial port connectors | .DE-9S (D-Type female) |
| Alarm connector (J8) | .DE-9S (D-Type female) |
| Driver output connector (J9) | .DE-9S (D-Type female) |
| Status LED's | .Front panel |
| Front panel display | .1x20 VF display (high contrast) |
| Configuration memory | .Lithium-back RAM |
| Memory retention | .>10 years |
| Cooling | .Convection |
| AC power requirements | .90-264VAC, 47-440Hz, 45Watts (max) |
| Fuse protection | .2A, 5mm (dual), AC models only |
| Weight | .12 lbs |
| Size | .1.75H x 6.50D x 19.00W (1RU) |
| Operating temp | .0 to +60C |
| Non-operating temp | -.20 to +85C |
| Humidity | .0 to 95% (NC @ +25C) |
| MTBF | .>55,000 hours |
| Contact life | .>1,000,000 (per port) |
| Warranty | .2 years |
| Certifications | .CE EN61010 |

Universal Switching's policy is one of continuous development. Consequently, the company reserves the right to vary from the descriptions and specifications shown in this publication.