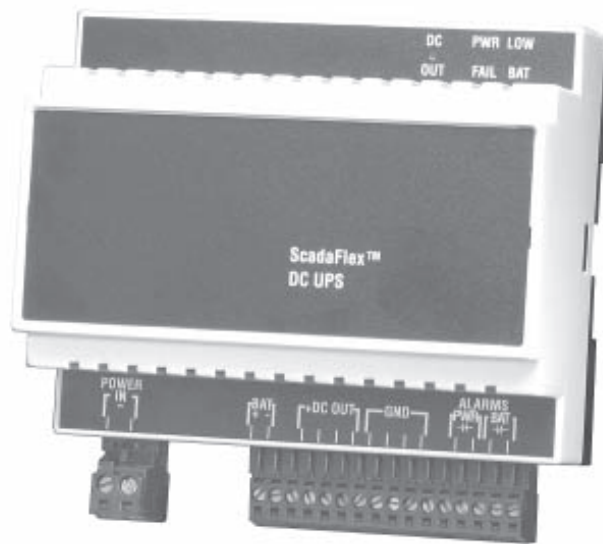


ScadaFlex DC UPS

12 & 24V Uninterruptable Power Supplies



- ◆ Clean regulated DC power
- ◆ 12 and 24 volt models
- ◆ Glitchless transitions between AC and battery power
- ◆ 120/240 Vac/dc autoswitch input
- ◆ High efficiency off-line switching technology
- ◆ "smart" battery charging
- ◆ Deep discharge battery protection
- ◆ Uses low-cost Gell-Cell batteries
- ◆ Power Fail alarm contact
- ◆ Low Battery alarm contact
- ◆ No fans, no filters
- ◆ Snap-on DIN Rail Mounting
- ◆ -40°C to +75°C Operating Temperature Range
- ◆ 3 year Factory Warranty

ScadaFlex DC UPS

Technical Reference Manual

Copyright Notice

This document is copyrighted, 2003, by Industrial Control Links, Inc.

All rights are reserved.

Industrial Control Links, Inc. reserves the right to make improvements to the products described in this manual at any time without notice.

No part of this manual may be reproduced, copied, translated or transmitted in any form or by any means without the prior written permission of Industrial Control Links, Inc. Information provided in this manual is intended to be accurate and reliable. However, Industrial Control links, Inc. assumes no responsibility for its use, nor for any infringements upon the rights of third parties which may result from its use.

Acknowledgments

ScadaFlex, **ScadaFlex Plus**, **ScadaWorks** and **ScadaBuilder** are trademarks of Industrial Control Links, Inc.

In This Manual . . .

This manual provides the technical hardware information required for system design and installation of a ScadaFlex DC Uninterruptable Power Supply (UPS).

If you have just purchased a ScadaFlex UPS, we hope that you are as pleased using it as we have been developing it.

If you are reading this manual looking at a future purchase, we hope that you will consider using a ScadaFlex UPS when you have an application that needs a compact, reliable, wide temperature range power supply that keeps your system running through power glitches, brownouts and complete power failures.

Support

If you have questions or need help with an application, we hope that you'll take advantage of our free technical support. Simply call us at:

(800) 888-1893

If you need to send us a fax, use either:

(530) 888-1300 or (530) 888-7017

You may also send us e-mail at:

icl@www.iclinks.com

For additional technical information including datasheets, manuals and software, visit our web site at:

www.iclinks.com

Contents

About the ScadaFlex UPS	5
With Outside Power . . .	
On Battery Power . . .	
ScadaFlex DC UPS Familiarization	6
High Efficiency Switching Power Supply with Battery Support	
Output Power Status Indicator	
Input Power Failure and Low Battery Level Alarm Indicators	
35mm. DIN Rail Mounting	
Input Power Failure and Low Battery Level Alarm Contacts	
DC Power Output Terminals	
Battery Connections	
120V/240V Power Input	
Mounting	8
Maintenance	9
Specifications	10

About the ScadaFlex UPS

ScadaFlex™ UninterruptablePower Supplies (UPS) provide clean, stable DC power for ScadaFlex Controllers, RTUs and distributed I/O modules. Their high efficiency operation delivers clean reliable power over an extra-wide operating temperature range, compatible with ICL's Controllers, RTUs and distributed I/O devices.

Two power supply models are available; providing a choice of 12Vdc or 24Vdc power. Both models use the latest cool off-line switching technology that accepts a wide range of input power, AC or DC, without large bulky, inefficient transformers. No switches, jumpers or wiring changes are required for 120V or 240V operation.

WITH OUTSIDE POWER . . .

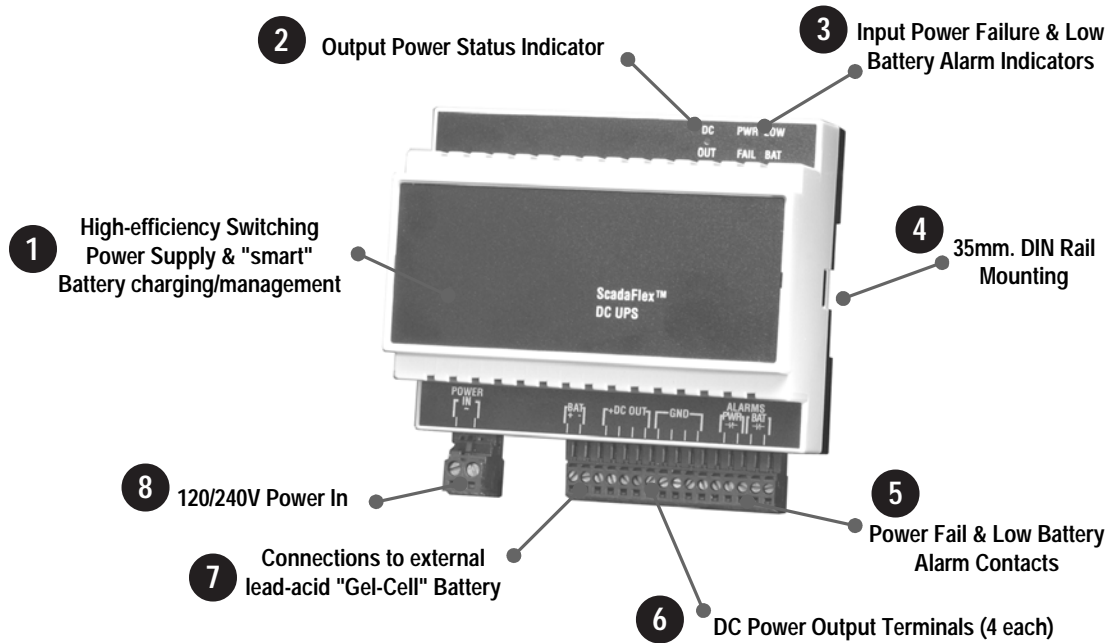
When outside power is available, the power supply output is a regulated 13.8Vdc (12 volt version) or 27.6 (24 volt version), for maximum performance from radios and other battery operated equipment. The DC output power is regulated, filtered and protected from power line transients.

ON BATTERY POWER . . .

When outside power is lost, the ScadaFlex UPS automatically switches over to a low-cost lead acid "Gell-Cell" battery, providing constant glitch-free DC power to the control system. A built-in microprocessor constantly monitors the condition of the battery. When the battery reaches the end of it's capacity (during an extended power outage), the UPS cleanly switches off power to the control system and prevents deep discharge damage to the battery. The same microprocessor control quickly and safely recharges the battery when outside power is restored. Separate power failure and battery status alarm relay contacts are provided.

ScadaFlex DC UPS Familiarization

The diagram below highlights the main physical features of the ScadaFlex DC UPS that are discussed in the following pages.



1 High Efficiency Switching Power Supply with Battery Support

The ScadaFlex UPS combines a very high efficiency power supply for cool operation with a “smart” microprocessor-based battery charger and battery monitor that constantly tests the battery charge level and protects the battery from deep discharge damage.

2 Output Power Status Indicator

This is a green LED indicator that is lit whenever DC power is available at the output terminals. The indicator (and output power) will go off when input power is lost and battery power is exhausted, or when an overload is sensed. Output power is automatically reestablished when input power or battery power is reapplied, or when the overload is removed.

3 Input Power Failure and Low Battery Level Alarm Indicators

A pair of red LED indicators that light to indicate when input power has been lost (PWR FAIL), or when the battery charge level is low or the battery is disconnected (LOW BAT). These indicators mimic the alarm contact outputs.

4 35mm. DIN Rail Mounting

The Controller snaps onto a standard 35mm. DIN rail. A release catch is accessible under the Discrete Inputs terminal block (unplug block for access)

5 Input Power Failure and Low Battery Level Alarm Contacts

A pair of isolated alarm relay contacts. Contact configuration is NORMALLY CLOSED. The contacts open to indicate an alarm condition. The power failure alarm is activated when the input power drops below 75V (approximately). The low battery alarm is activated when the battery voltage falls below 10.5V (21.0V on 24V UPS), and remains activated until the battery charges to 12.0V (24.0V on 24V UPS). When both alarm contacts open, there is no DC power output (input power and battery power have both failed, or the output has shut down due to an overload).

6 DC Power Output Terminals

4 Positive Output and 4 “Ground” terminals are provided for power distribution. Distributing power from this central point in a “star” configuration is typically preferable to “daisy-chaining” power.

7 Battery Connections

For battery-backed operation, an external lead-acid battery must be connected to these terminals. Typical battery capacities are 3AH to 18AH. One 12V battery is used for 12V systems, while 2 12V batteries, connected in series, are used for 24V systems. Pay attention to battery polarity!

8 120V/240V Power Input

The ScadaFlex UPS accepts either 120V or 240V (90 to 264Vac, 130 to 375Vdc) input power without changing switches or jumpers. The input is transient/surge protected and noise filtered.

Wiring

The ScadaFlex UPS has two removable terminal blocks for wiring connections; a 2 position block for input power, and a separate 16 position terminal block for the battery, DC output and alarm connections.

Input Power

The ScadaFlex UPS can accept either AC or DC input power over a very wide range; 90 to 264Vac or 130 to 375Vdc.

Battery Power Connections

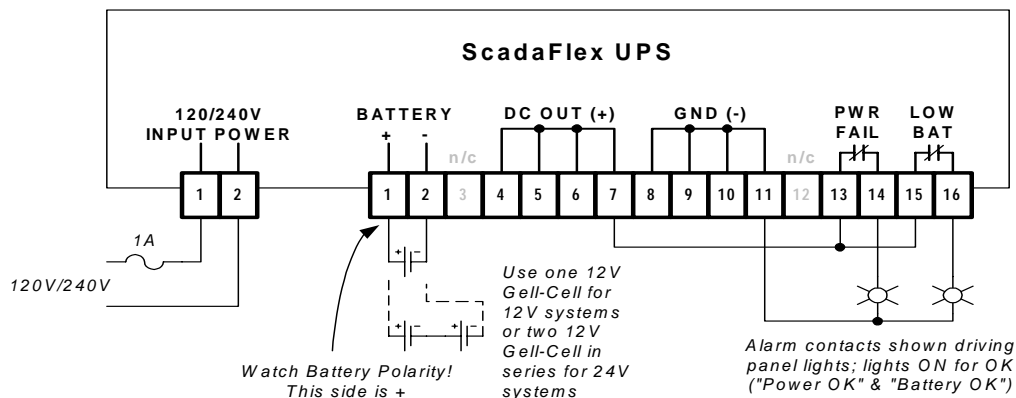
The left hand two terminals of the 16 position terminal strip are used for connection to a lead-acid “gell-cell” type battery. Use one battery for 12 volt systems, two batteries wired in series for 24 volt systems. The polarity of the battery connections is critical; the first (left-hand) terminal must be connected to the positive terminal of the battery.

DC Output Connections

The ScadaFlex UPS has 4 DC output power connections (+) and 4 “Ground” (return or -). Each group of four terminals are bussed together internally to simplify power distribution in your control system.

Alarm Contacts

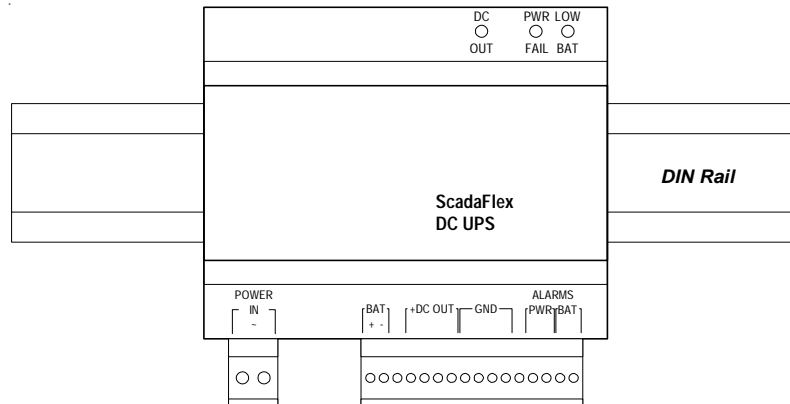
The ScadaFlex UPS has two sets of alarm contacts; one for indicating when input power has failed, and a second set for indicating when the battery charge level is low or the battery is disconnected. Both sets of contacts are normally closed, and will open when the alarm condition is active. The alarm contacts are isolated “dry” relay contacts for ease of interfacing to other equipment. If the contacts are used with inductive loads (such as relay coils), place snubbers across the loads to minimize contact arcing.



ScadaFlex UPS - Typical Wiring Example

Mounting

The ScadaFlex DC UPS is designed for mounting to a standard 35mm. DIN rail on the back panel of a protective electrical enclosure. Since it has no fans, the UPS depends on convection air flow for cooling. The UPS should be mounted to a vertical backplate as shown below (preferably NOT rotated 90°), leaving clearance above and below the UPS for unrestricted air flow.



Be sure to leave extra clearance below the UPS to provide easy wiring access and simplify installation and maintenance. Since there are no wiring terminals along the top edge of the UPS, less clearance is required above the UPS, except to allow for convection air flow. No clearance is required on either end of the UPS, so the UPS may be “stacked” with other ScadaFlex Controllers, I/O modules and other DIN rail mounted equipment.

Maintenance

ScadaFlex Uninterruptable Power Supplies are designed for long-term maintenance-free operation. There are no user serviceable parts inside and no periodic maintenance required.

Cleaning

Be sure that power is turned OFF or disconnected before cleaning the ScadaFlex UPS case. Use a damp cloth; no solvents or cleaning solutions.

Removal

The ScadaFlex UPS is designed for DIN rail mounting. Before removing the UPS from the DIN rail, unplug both terminal blocks. When the larger terminal block is removed, you will see the end tab of the DIN rail mounting clip. Using a small flat-blade screwdriver, gently pull this clip down, and rotate the UPS case upwards and off of the DIN rail.

Specifications

12 VOLT DC Model# 90-0011

DC OUTPUT

Output Voltage:

<i>Nominal</i>	13.8 Vdc
<i>Range, with External Power</i>	13.5 Vdc to 14.1Vdc
<i>Range, with Battery Power</i>	9.5 Vdc to 13.8Vdc

Output Current:

<i>Continuous</i>	2.5 A (up to 55°C), derate 2%/°C from 55°C to 75°C (1.5A @ 75°C)
<i>Peak</i>	3.0A (10 seconds, 25% Duty Cycle, up to 55°C. Derate 2%/°C from 55°C to 75°C)

Overload Protection:

<i>with External Power</i>	3.5A, Foldback current limiting
<i>with Battery Power</i>	5.0A (25°C), Self-resetting polymer fuse

BATTERY LOW - ALARM OUTPUT

<i>Battery OK Threshold</i>	> 12.0 Vdc
<i>Low Battery Threshold</i>	<10.5 Vdc
<i>Battery Cut-off Threshold</i>	<10.0 Vdc

24 VOLT DC Model# 90-0012

DC OUTPUT

Output Voltage:

<i>Nominal</i>	27.6 Vdc
<i>Range, with External Power</i>	27.0 Vdc to 28.2Vdc
<i>Range, with Battery Power</i>	19.0 Vdc to 27.6Vdc

Output Current:

<i>Continuous</i>	1.25 A (up to 55°C), derate 2%/°C from 55°C to 75°C (0.75A @ 75°C)
<i>Peak</i>	1.5A (10 seconds, 25% Duty Cycle, up to 55°C. Derate 2%/°C from 55°C to 75°C)

Overload Protection:

<i>with External Power</i>	1.75A, Foldback current limiting
<i>with Battery Power</i>	2.5A (25°C), Self-resetting polymer fuse

BATTERY LOW - ALARM OUTPUT

<i>Battery OK Threshold</i>	>24.0 Vdc
<i>Low Battery Threshold</i>	<21.0 Vdc
<i>Battery Cut-off Threshold</i>	<20.0 Vdc

COMMON SPECIFICATIONS

INPUT (External) POWER

<i>Input Voltage</i>	90 to 264 Vac / 130 to 375 Vdc
<i>Input Current</i>	0.50A at 120Vac 0.25A at 240Vac
<i>Recommended Input Fuse</i>	1.0A Slo-Blo (120Vac) 0.5A Slo-Blo (240Vac)
<i>Input Frequency</i>	DC or 47 to 63Hz
<i>Efficiency</i>	Approximately 85%, 100% load, 120Vac In

BATTERY SUPPORT (batteries are user supplied)

<i>Supported Battery Technology</i>	Sealed ("Gell-Cell") Lead Acid
<i>Battery Capacity</i>	3AH to 18AH
<i>Battery Charging Current Limit</i>	0.35A maximum
<i>Battery Charging Technique</i>	Pulsed Constant Current, followed by Constant Voltage Float charge

DC OUTPUT (with external power)

<i>Line Regulation</i>	1%, low-line to high-line
<i>Load Regulation</i>	3%, 0% to 100% Load
<i>Ripple and Noise</i>	750mV pk-pk maximum
<i>Hold Time</i>	>20mS at 100% Load
<i>Overload Protection</i>	Foldback Current Limiting with Automatic Restart
<i>Isolation</i>	Input to Output \geq 2500VAC Input to Ground \geq 1500VAC Output to Ground \geq 500VDC

ALARM OUTPUTS

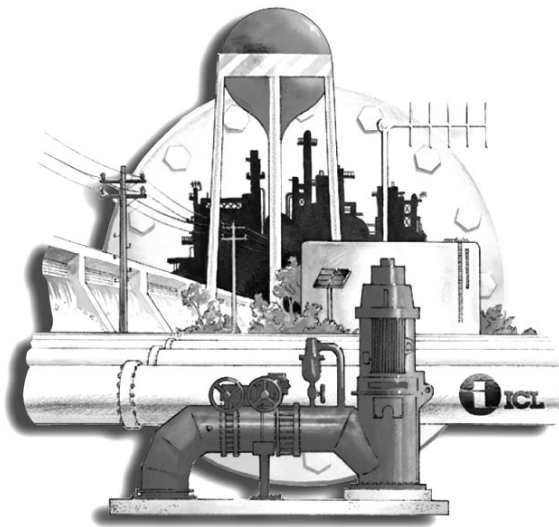
<i>Quantity</i>	2 Isolated relay contacts
<i>Alarm Action</i>	Normally Closed, Open on Alarm
<i>Alarm Conditions</i>	Alarm Output #1 - Power Fail Alarm Output #2 - Low-Battery
<i>Alarm Contact Ratings</i>	up to 1A, 30Vdc up to 0.5A, 120Vac

ENVIRONMENTAL SPECIFICATIONS

<i>Dimensions</i>	4.2" W x 4.2" L x 2.3" D (105mm x 105mm x 58mm)
<i>Mounting</i>	35mm. DIN rail
<i>Operating Temperature</i>	-40°C to 75°C (-40°F to 167°F)
<i>Storage Temperature</i>	-40°C to 85°C (-40°F to 185°F)
<i>Humidity</i>	5 to 85% RH (non-condensing)

ORDER PART NUMBERS:

90-0011	12Vdc (nominal) DC, 40W Uninterruptable Power Supply
90-0012	24Vdc (nominal) DC, 40W Uninterruptable Power Supply



Industrial Control Links, Inc.
12840 Earhart Ave.
Auburn, CA 95602

USA/Canada: (800) 888-1893
International: (530) 888-1800

Fax: (530) 888-1300
(530) 888-7017

E-mail: icl@iclinks.com

Web-site: www.iclinks.com