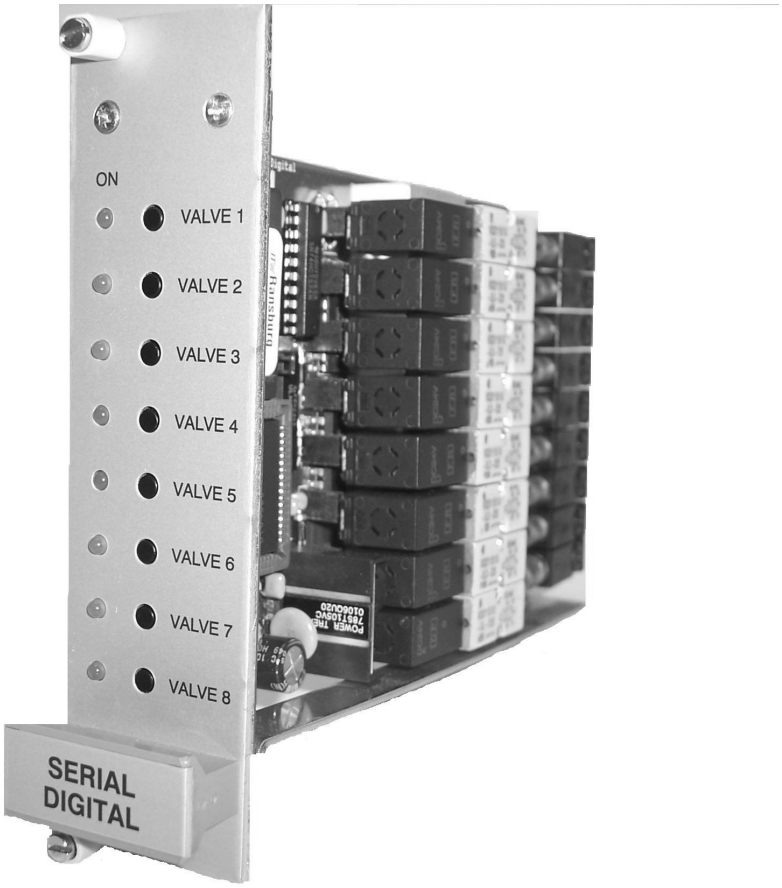
Ransburg

SERVICE MANUAL
LN-9257-07.1
Replace LN-9257-07
April - 2013

SERIAL DIGITAL MODULE
USER MANUAL



MODEL: 76911

IMPORTANT: Before using this equipment, carefully read SAFETY PRECAUTIONS, starting on page 1, and all instructions in this manual. Keep this Service Manual for future reference.

Service Manual Price: $30.00 (U.S.)

CONTENTS

SAFETY

SAFETY PRECAUTIONS

Before operating, maintaining or servicing any Ransburg electrostatic coating system, read and understand all of the technical and safety literature for your Ransburg products. This manual contains information that is important for you to know and understand. This information relates to USER SAFETY and PREVENTING EQUIPMENT PROBLEMS. To help you recognize this information, we use the following symbols. Please pay particular attention to these sections.

A WARNING! states information to alert you to a situation that might cause serious injury if instructions are not followed.

A CAUTION! states information that tells how to prevent damage to equipment or how to avoid a situation that might cause minor injury.

A NOTE is information relevant to the procedure in progress.

While this manual lists standard specifications and service procedures, some minor deviations may be found between this literature and your equipment. Differences in local codes and plant requirements, material delivery requirements, etc., make such variations inevitable. Compare this manual with your system installation drawings and appropriate Ransburg equipment manuals to reconcile such differences.

Careful study and continued use of this manual will provide a better understanding of the equipment and process, resulting in more efficient operation, longer trouble-free service and faster, easier troubleshooting. If you do not have the manuals and safety literature for your Ransburg system, contact your local Ransburg representative or Ransburg.

⚠ WARNING

> The user MUST read and be familiar with the Safety Section in this manual and the Ransburg safety literature therein identified.

> This manual MUST be read and thoroughly understood by ALL personnel who operate, clean or maintain this equipment! Special care should be taken to ensure that the WARNINGS and safety requirements for operating and servicing the equipment are followed. The user should be aware of and adhere to ALL local building and fire codes and ordinances as well as NFPA-33 SAFETY STANDARD, prior to installing, operating, and/or servicing this equipment.

⚠ WARNING

> The hazards shown on the following page may occur during the normal use of this equipment. Please read the hazard chart beginning on page 2.

AREA Tells where hazards may occur.	**HAZARD** Tells what the hazard is.	**SAFEGUARDS** Tells how to avoid the hazard.
Spray Area 	Fire Hazard Improper or inadequate operation and maintenance procedures will cause a fire hazard. Protection against inadvertent arcing that is capable of causing fire or explosion is lost if any safety interlocks are disabled during operation. Frequent power supply shutdown indicates a problem in the system requiring correction.	Fire extinguishing equipment must be present in the spray area and tested periodically. Spray areas must be kept clean to prevent the accumulation of combustible residues. Smoking must never be allowed in the spray area. The high voltage supplied to the atomizer must be turned off prior to cleaning, flushing or maintenance. When using solvents for cleaning: Those used for equipment flushing should have flash points equal to or higher than those of the coating material. Those used for general cleaning must have flash points above 100°F (37.8°C). Spray booth ventilation must be kept at the rates required by NFPA-33, OSHA, and local codes. In addition, ventilation must be maintained during cleaning operations using flammable or combustible solvents. Electrostatic arcing must be prevented. Test only in areas free of combustible material. Testing may require high voltage to be on, but only as instructed. Non-factory replacement parts or unauthorized equipment modifications may cause fire or injury. If used, the key switch bypass is intended for use only during set-up operations. Production should never be done with safety interlocks disabled. Never use equipment intended for use in waterborne installations to spray solvent based materials. The paint process and equipment should be set up and operated in accordance with NFPA-33, NEC, and OSHA requirements.

AREA Tells where hazards may occur.	HAZARD Tells what the hazard is.	SAFEGUARDS Tells how to avoid the hazard.
General Use and Maintenance 	Improper operation or maintenance may create a hazard. Personnel must be properly trained in the use of this equip-	Personnel must be given training in accordance with the requirements of NFPA-33. Instructions and safety precautions must be read and understood prior to using this equipment. Comply with appropriate local, state, and national codes governing ventilation, fire protection, operation maintenance, and housekeeping. Reference OSHA, NFPA-33, and your insurance company
Electrical Equipment 	High voltage equipment is utilized. Arcing in areas of flammable or combustible materials may occur. Personnel are ex-posed to high voltage during operation and maintenance. Protection against inadvertent arcing that may cause a fire or explosion is lost if safety circuits are disabled during operation. Frequent power supply shutdown indicates a problem in the sys-tem which requires correction. An electrical arc can ignite coating materials and cause a fire or explosion.	The power supply, optional remote control cabinet, and all other electrical equipment must be located outside Class I or II, Division 1 and 2 hazardous areas. Refer to NFPA-33. Turn the power supply OFF before working on the equipment. Test only in areas free of flammable or combustible material. Testing may require high voltage to be on, but only as instructed. Production should never be done with the safety circuits disabled. Before turning the high voltage on, make sure no objects are within the sparking distance.

AREA Tells where hazards may occur.	HAZARD Tells what the hazard is.	SAFEGUARDS Tells how to avoid the hazard.
Explosion Hazard/ Incompatible Materials 	Halogenated hydrocarbon solvents for example: methylene chloride and 1,1,1,-Trichloroethane are not chemically compatible with the aluminum that might be used in many system components. The chemical reaction caused by these solvents reacting with aluminum can become violent and lead to an equipment	Aluminum is widely used in other spray application equipment - such as material pumps, regulators, triggering valves, etc. Halogenated hydrocarbon solvents must never be used with aluminum equipment during spraying, flushing, or cleaning. Read the label or data sheet for the material you intend to spray. If in doubt as to whether or not a coating or cleaning material is compatible, contact your material supplier. Any other type of solvent may be used with aluminum equipment.
Spray Area / High Voltage Equipment 	This is a high voltage device that can produce electrical arcs capable of igniting coating materials.	Parts being sprayed must be supported on conveyors or hangers and be grounded. The resistance between the part and ground must not exceed 1 megohm. (Reference NFPA-33.) A safe distance must be maintained between the parts being coated and the atomizer bell. A distance of at least 1 inch for each 10 KV of power supply output voltage is required at all times. Parts must be supported so that they will not swing and reduce the clearance specified above. All electrically conductive objects in the spray area, with the exception of those objects required by the process to be at high voltage, must be grounded. Unless specifically approved for use in hazardous locations, the power supply and other electrical equipment must not be used in Class I, Division 1 or 2 locations.

INTRODUCTION

GENERAL DESCRIPTION

The Serial Digital Pneumatic Module converts electronic signals to eight pneumatic signals. it is packaged as a Eurocard module and fits into a Eurocard rack with a 78145 series motherboard. When configured in retrofit mode, it plugs into a 74847 motherboard. The module has an electrical connector and a quick disconnect pneumatic connector.

The Serial Digital Pneumatic Module may be commanded from any of three sources:

- Serial bus
- Discrete 24 VDC inputs (new or retrofit)
- Ransburg parallel (TTL) bus (for retrofit applications).

On the module front panel, LED's indicate when each valve is energized. Also, the front panel switches provide momentary manual override for each valve. These front panel switches can be locked-out with an on-module switch setting or by a signal from the electrical connector.

SPECIFICATIONS

Environmental / Physical

Temperature	
Operating:	0° to 55° C
Storage:	-40° C to 85° C
Humidity:	95% Non-Condensing (Max.)
Size:	100 x 160mm Eurocard module, 35mm wide
Pneumatic Input	
Input Pressure:	0-100 psi (0-6.8 bar)
Burst Pressure:	250 psi (17.0 bar)
Leak Rate:	1.75 SCFM (Max.)
Req. Filtration:	10 micron
Water Vapor Content:	1.3 g/m^3 (Max.)
Oil Vapor Content:	0.1 mg/kg (Oil/Water) (Max.)
Pneumatic Output	
Module Flow Rate:	1.9 SCFM (1 Valve On)
Valve CV Factor:	1.2 SCFM (All Valves On)
Valve Effective Area:	0.9mm^2

Electrical Requirements

Input Voltage:	24 VDC
Input Current:	760 mA (All valves on)
Input Current Protection:	Polyfuse (Auto Reset)

MODES OF I/O

The Serial Digital Module may run in three different I/O modes:

1. Discrete Inputs

2. Serial Bus

3. Parallel (TTL) Bus (retrofit only)

Discrete 24 VDC Signals (Replaces 75119-01)

The following settings must be made by the user to enable this mode:

Switch SW1, Jumper E2 OUT

Valves are actuated by a 24 VDC signal applied to the 8-pin pluggable terminal strip on the rear side of the motherboard. The ground reference for these inputs is the 24 VDC ground terminal. The actual terminal numbers vary depending on which motherboard is used. In this mode of operation, the following motherboards may be used: 78145-00, 78147-00, and 74847-00 (retrofit). The Lockout signal (used to defeat the operation of the front panel push buttons) is set on each module by setting SW1-1 to ON.

Serial Bus via the LECU4012 Serial Node Adapter (SERNA) or the 78553 Node Adapter Plus (NA+)

The following settings must be made by the user to enable this mode:

Switch SW1, 4 Position Switch OFF (Down Position), Jumper E2 OUT (2 Position)

In this mode of operation all communication to the valves is by serial bus from the SERNA (or NA+) on the 78145-00 or 78147-00 motherboards. The PLC addressing is shown in the SERNA (or NA+) manual.

Parallel (TTL) Bus (Replaces 75119-02)

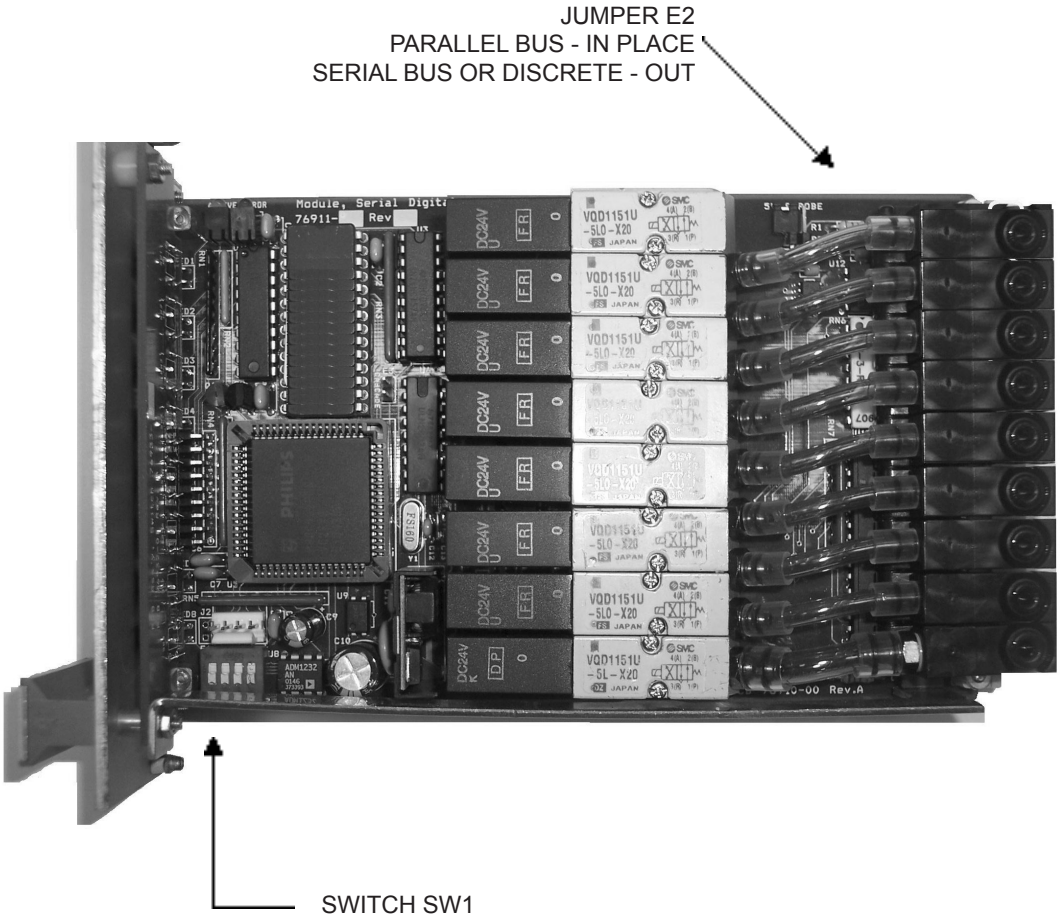
The following settings must be made by the user to enable this mode:

Switch SW1, 4 Position Switch ON, Jumper E2 IN

This mode is for retrofit applications in the 74847-01 motherboard only. Communication is via the 75586-01 RansPak Node Adapter with A10044-00 Node per Bell Slave Adapter or via the 75584-00 Digital Node Adapter.

Manual Valve Operation

Valves may be manually operated using the black front panel push buttons. The push buttons require very little travel and may be operated with a finger against the panel. If the valve is already On by an external signal, operation of the manual push button will turn that valve Off. The manual push button operation is defeated when in Manual Lockout mode.



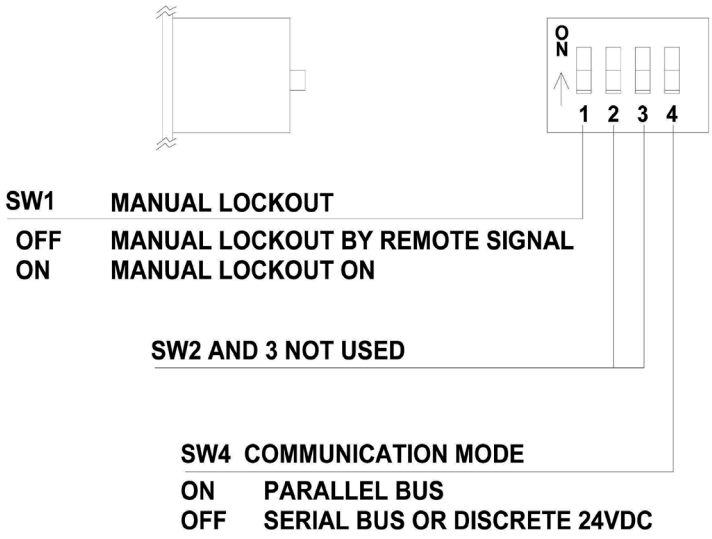


Figure 1: Serial Digital Module Settings

NOTES

INSTALLATION

POWER

Connect 24 VDC to J7 Pin-4 and 24 VDC return (GND) to J7 Pin-3.

CONTROL SIGNALS

1. Discrete 24 V Inputs - Connect individual 24 VDC Inputs to the 8-Pin terminal strip for each module.

2. Serial Bus via Serial Node Adapter - Connect Serial Bus output from Serial Node Adapter to J4 using shielded twisted pair cable, connecting shield to GND terminal, (+) to (+) and (-) to (-). If Serial Bus goes onto other motherboards, connect cable to J10, otherwise connect 120 ohm from J10 (+) to J10 (-).

PNEUMATIC CONNECTIONS

Connect supply air to the bottom connector for each module using 1/4” OD tube. Make connections to the pneumatic devices being controlled using 5/32” OD (4mm) tube.

REMOTE I/O

Direct connection to Rockwell/Allen-Bradly Remote I/O can be made via the Serial Node Adapter or Serial Node Adapter +. Connect the Allen-Bradley (AB) RIO cable directly to the motherboard of the Node Adapter (78145-00 or LECU4012). If the Serial Digital Module is in the same motherboard as the Serial Node Adapter (78145-00), no further connection is necessary. If the Serial Digital Module is located in a different motherboard (78147-00) the local serial bus must be connected via the connector labeled “Serial Bus”.

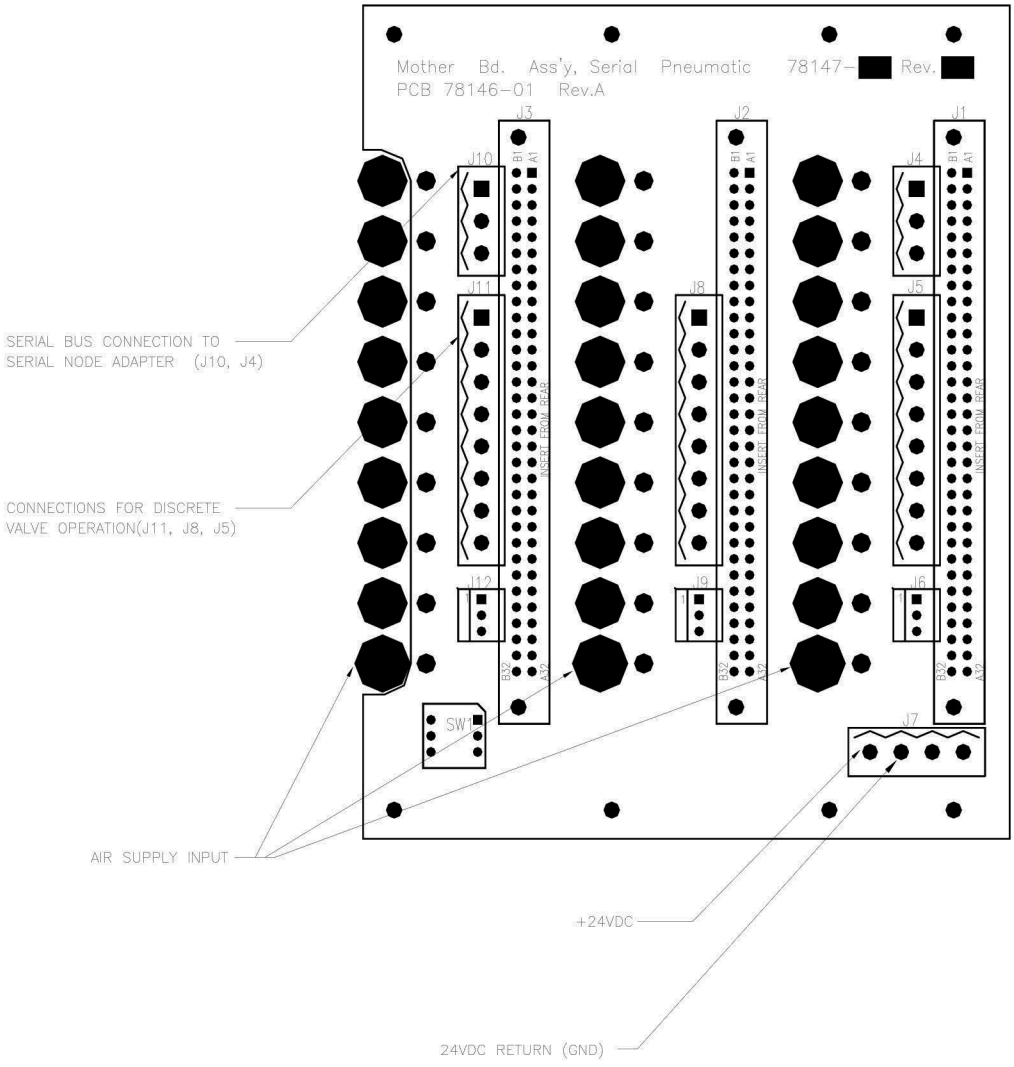


Figure 2: Serial Digital Module Installation

SERIAL DIGITAL MODULE	
Part #	Description
76911-02	Serial Digital Modules
76911-01	Cascaded Serial Digital Module
78145-00	1/4 Rack Motherboard, Type 0, SerNA + Serial Pneumatic
78147-00	1/4 Rack Motherboard, Type 1, Serial Pneumatic
78149-00	1/4 Rack Motherboard, Type 2, Serial Cascaded Digital
LECU4014-02	1/4 Rack Motherboard, Type 3, MicroPak + Node Adapter
7554-03	Replacement O-Ring

WARRANTY POLICIES

LIMITED WARRANTY

Ransburg will replace or repair without charge any part and/or equipment that falls within the specified time (see below) because of faulty workmanship or material, provided that the equipment has been used and maintained in accordance with Ransburg's written safety and operating instructions, and has been used under normal operating conditions. Normal wear items are excluded.

THE USE OF OTHER THAN RANSBURG APPROVED PARTS, VOID ALL WARRANTIES.

SPARE PARTS: One hundred and eighty (180) days from date of purchase, except for rebuilt parts (any part number ending in "R") for which the warranty period is ninety (90) days.

EQUIPMENT: When purchased as a complete unit, (i.e., guns, power supplies, control units, etc.), is one (1) year from date of purchase. WRAPPING THE APPLICATOR IN PLASTIC, ASSOCIATED VALVES AND TUBING, AND SUPPORTING HARDWARE IN PLASTIC, SHRINK-WRAP, OR ANY OTHER NON-APPROVED COVERING, WILL VOIDE THIS WARRANTY.

RANSBURG'S ONLY OBLIGATION UNDER THIS WARRANTY IS TO REPLACE PARTS THAT HAVE FAILED BECAUSE OF FAULTY WORKMANSHIP OR MATERIALS. THERE ARE NO IMPLIED WARRANTIES NOR WARRANTIES OF EITHER MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. RANS-BURG ASSUMES NO LIABILITY FOR INJURY, DAMAGE TO PROPERTY OR FOR CONSEQUENTIAL DAMAGES FOR LOSS OF GOODWILL OR PRODUCTION OR INCOME, WHICH RESULT FROM USE OR MISUSE OF THE EQUIPMENT BY PURCHASER OR OTHERS.

EXCLUSIONS:

If, in Ransburg's opinion the warranty item in question, or other items damaged by this part was improperly installed, operated or maintained, Ransburg will assume no responsibility for repair or replacement of the item or items. The purchaser, therefore will assume all responsibility for any cost of repair or replacement and service related costs if applicable.

Ransburg

Service Manual Price: $30.00 (U.S.)

Manufacturing
1910 North Wayne Street
Angola, Indiana 46703-9100
Telephone: 260/665-8800
Fax: 260/665-8516

Technical/Service Assistance
Telephone: 800/ 233-3366 Fax: 419/ 470-2071
www.ransburg.com

Technical Support Representative will direct you to the appropriate telephone number for ordering Spare Parts.

Form No. LN-9257-07.1
Litho in U.S.A.
04/13