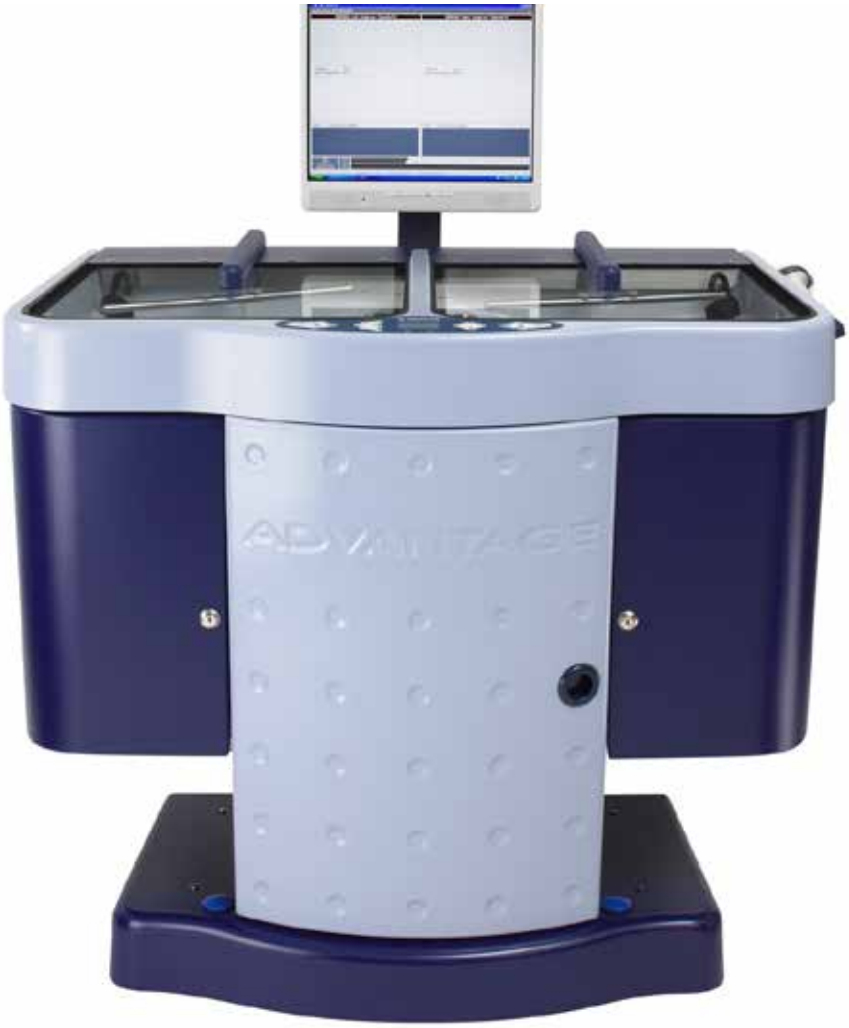
ADVANTAGE PLUS™

Automated Endoscope Reprocessor



USER MANUAL

ENDOSCOPE CLEANING
& DISINFECTION SYSTEM

With optional cleaning cycle

CANTEL

50097-429-EN.EU/H – ADVANTAGE PLUS 2.0

CONTENTS

CHAPTER 1

INTRODUCTION

This chapter describes the ADVANTAGE PLUS™ Automated Endoscope Reprocessor.

USING THIS MANUAL

This manual describes the features of the ADVANTAGE PLUS Reprocessor, including the hardware, software, setup, operation, safety, maintenance, and troubleshooting procedures. It is important to follow the instructions provided to keep the ADVANTAGE PLUS Reprocessor in proper operating order and to ensure that endoscopes receive adequate disinfection.

This is not a service manual and does not provide detailed instructions for service beyond general maintenance. See Service Manual for servicing instructions. Contact your service representative for additional service information.

ADVANTAGE PLUS Reprocessor Features

The ADVANTAGE PLUS Reprocessor was designed for ease of use and maintenance in the disinfection of endoscopes. Features include:

- Individual channel connectivity and channel blockage monitoring.
- Single use germicide: fresh disinfectant solution for each endoscope.
- Asynchronous operation of dual reprocessing basins with transparent glass lids.
- A dedicated personal computer (PC) for system operation of reprocessing cycle, cycle recording, powerful quality assurance reporting, easy backups, networking availability, and remote diagnostics.
- Easy-to-fill detergent and alcohol reservoirs.
- Hookup blocks dedicated to a family of endoscopes ensure correct connectivity and flow rates to meet manufacturers' specifications.
- Diagnostics for operator assistance and troubleshooting.
- Cleaning phase validated to eliminate manual cleaning of endoscopes prior to reprocessing (endoscopes must be pre-cleaned immediately after procedures).

SAFETY

Intended Use

The ADVANTAGE PLUS™ Reprocessor is intended for the cleaning and high level disinfection of endoscopes and endoscope accessories.

The ADVANTAGE PLUS Reprocessor has been validated by Medivators for use only with RAPICIDE™ PA High-Level Disinfectant and ADASPOR™ Single Shot High-Level Disinfectant or INTERCEPT™ Detergent.

Indications for Use of the ADVANTAGE PLUS Reprocessor:

ADVANTAGE PLUS Reprocessor tests, cleans, disinfects and rinses endoscopes, such as fiberoptic and video endoscopes between patient uses. The ADVANTAGE PLUS Reprocessor is indicated to provide high level disinfection of heat sensitive semi-critical endoscopes and related accessories. Manual cleaning of endoscopes is not required prior to placement in the ADVANTAGE PLUS Reprocessor. The endoscopes must be pre-cleaned immediately after use.

The ADVANTAGE PLUS Reprocessor uses RAPICIDE PA High-Level Disinfectant to provide high level disinfection of endoscopes when used according to the directions for use. The system uses INTERCEPT Detergent in its cleaning cycle at a concentration of 0.5%.

RAPICIDE™ PA Test Strips are used after the disinfection cycle to ensure that the used disinfectant is at or above the minimum recommended concentration (MRC) of 850 ppm peracetic acid; this ensures that the disinfectant was above MRC during the entire disinfection cycle. RAPICIDE PA High-Level Disinfectant should be used in the ADVANTAGE PLUS Reprocessor under the following contact conditions**:

Contact Time: 5 minutes

Temperature: 20°C

MRC: 850 ppm

**Use-conditions may vary by country. Please contact your Medivators representative for information.

CAUTION: When using the cleaning cycle, endoscopes must be precleaned according to SGNA and facility guidelines. Manual cleaning of the endoscopes is not required. It is recommended that reprocessing using the cleaning cycle be performed within one hour after the procedure. If the cleaning cycle is not chosen, endoscopes must be manually cleaned before placing in the reprocessor for disinfection.

**For countries adopting German guidelines*, utilize PROTEAZONE™ PLUS Detergent as it has been validated for use by Medivators.
PROTEAZONE PLUS Detergent is utilized under the following contact conditions:
Contact Time: 5 minutes
Temperature: 30ºC
MRC: 850 ppm.

Regulatory Compliance

The ADVANTAGE PLUS™ Reprocessor complies with EN 60601-1-2 Electromagnetic Compatibility (EMC) Standards.

The reprocessor is ETL and cETL certified and listed for safety per IEC Standard IEC 61010-1, UL Standard UL 61010-1 and Canadian Standard CAN/CSA-C22.2 No. 61010-1 for laboratory equipment.

*Guideline for the Validation of Mechanical Cleaning and Disinfection Processes for the reprocessing of thermolabile endoscopes

NOTES, CAUTIONS, AND WARNINGS

Throughout the manual and on the ADVANTAGE PLUS Reprocessor are notes, service notes, cautions, warnings, and symbols.

Note: A note refers to important information to which you should pay special attention.

Service: A service note refers to operations or repairs that only a trained service technician may perform.

CAUTION: A caution describes actions or conditions that may cause damage to or destruction of the equipment.

WARNING: A WARNING DESCRIBES ACTIONS AND CONDITIONS THAT MAY CAUSE SEVERE PERSONAL INJURY OR DEATH TO THE OPERATOR OR PATIENT.

Wear proper personal protective equipment (PPE)

Acid Present

Electrical Grounding! Indicates any terminal which is intended for connection to an external conductor for protection against electrical shock in case of a fault, or the terminal of a protective earth (ground) electrode.

OPERATOR SAFETY

- Equipment must be operated solely by qualified personnel, and used for its intended use only. Never use the reprocessor for any purpose other than the manufacturer's specific intended purpose.

WARNING: TO AVOID BIOLOGICAL CONTAMINATION AND CHEMICAL BURNS, ALWAYS WEAR APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT (PPE) WHEN HANDLING ENDOSCOPES OR DISINFECTANT SOLUTIONS.

- Cleaning and disinfectant solutions must be used according to the regulations governing their use, safety, and shelf life.
- Do not attempt to open the reprocessor lid during operation.
- Do not place heavy objects on the glass covers.
- For peracetic acid (PAA) disinfectant handling guidelines, refer to the American National Standard recommended practice titled, *Chemical Sterilants and High Level Disinfectants: A Guide to Selection and Use* (AAMI TIR7:1999) and/or *Safe Handling and Biological Decontamination of Reusable Medical Devices in Health Care Facilities and in Nonclinical Settings* (AAMI/ANSI ST35:2003). The documents are available from the Association for the Advancement of Medical Instrumentation.
- In the event of a disinfectant or other chemical leak, use personal protective equipment (clothing, gloves and safety glasses) and follow the disinfectant manufacturer's guidelines for spill clean-up procedures.
- Place guidelines for disinfectant clean-up in an easily visible area near the reprocessor to ensure users will have access to the information when needed.
- It is recommended that the facility conduct regular training of all personnel concerned with the operation and maintenance of this equipment, including emergency procedures for toxic, flammable or pathogenic material released into the environment. Records of attendance at training should be maintained and evidence of understanding demonstrated.

CHEMICALS

The ADVANTAGE PLUS™ Reprocessor is intended for use with RAPICIDE™ PA High-Level Disinfectant and INTERCEPT™ Detergent** to reprocess endoscopes. Refer to the American National Standard recommended practice titled, *Chemical Sterilants and High Level Disinfectants: A Guide to Selection and Use* (AAMI TIR7:1999) and/or *Safe Handling and Biological Decontamination of Reusable Medical Devices in Health Care Facilities and in Nonclinical Settings* (AAMI/ANSI ST35:2003). The documents are available from the Association for the Advancement of Medical Instrumentation.

CAUTION: For all chemicals used within the ADVANTAGE PLUS™ Reprocessor, refer to the respective chemical labeling, instructions-for-use (IFU) and/or safety data sheet (SDS) for chemistry constituents as well as for safety and handling guidelines. These documents should be displayed and stored near the reprocessor for easy access in the event of a chemical spill or emergency resulting in contact with any chemical that is considered hazardous.

ALCOHOL SOLUTION

The ADVANTAGE PLUS Reprocessor accommodates user-supplied 70% Ethyl Alcohol or 70% Isopropyl Alcohol for end-of-cycle endoscope purging.

**PROTEAZONE™ PLUS Detergent for countries adopting German guidelines*.

Handling and Storage of 70% Isopropyl Alcohol

Handling

Avoid prolonged or repeated contact with skin. Extinguish any naked flames. Remove ignition sources. Avoid sparks. Do not smoke. Take precautionary measures against static discharges. Earth all equipment. Do not empty into drains.

Handling Temperatures
Ambient.

Storage
Keep away from direct sunlight and other sources of heat or ignition. Do not smoke in storage areas. Keep container tightly closed and in a well-ventilated place.

Storage Temperatures
Ambient.

Product Transfer
Take precautionary measures against static discharges. Earth all equipment. Avoid splash filling.

Disposal Requirements
Dispose of in accordance with product labeling requirements.

Respiratory Protection
No specific measures.

Eye Protection
Monogoggles.

Body Protection
Standard issue work clothes. Safety shoes or boots – chemical resistant.

INSTALLATION AND MAINTENANCE

Proper maintenance ensures effective disinfection and prolongs the life of the reprocessor.

- The ADVANTAGE PLUS™ Reprocessor must be grounded in accordance with applicable regulations.
- The system default is factory-set for the specific disinfectant immersion time for RAPICIDE™ PA High-Level Disinfectant and ADASPOR™ Single Shot High-Level Disinfectant.
- All pressure regulators are factory-preset. Do not adjust the settings. Contact your Technical Support representative for assistance.
- Do not allow the washing solution to contact metal components.
- Do not use alcohol or alcohol-based products to clean the reprocessor cabinet.
- Medivators endoscope hookups are not autoclavable. The hookups are automatically disinfected with each use due to their exposure to the entire disinfection cycle; no further disinfection or rinsing is required prior to their next use.
- Do not remove covers, doors, or panels fastened with screws while the reprocessor is in use.
- Replacement parts must be ordered from the manufacturer to maintain the warranty and to ensure proper operation for reprocessing.
- Do not block ventilation openings.
- Regularly check all cables, tubing, and drains for damage or leaks.
- Do not carry out any maintenance that is not described in this manual.
- Ensure that the power supply connection is accessible in the event that emergency disconnection is necessary.
- Prior to undertaking any service or maintenance operations or when resetting the GFI, ensure that the ADVANTAGE PLUS Reprocessor is disconnected from the main power supply. If service or maintenance operations are to be conducted on the water system, ensure that the ADVANTAGE PLUS Reprocessor is isolated from the main water supply.
- Only properly trained individuals may operate or service the reprocessor.

For service or service-related questions, contact Medivators Technical Support at (+31) 45 5 471 444 or your local Medivators Distributor.

GUIDELINES FOR RELIABLE DISINFECTION

Water Quality

Potable water is the minimum standard, Medivators recommends the use of a high quality water pre filtration system that filters incoming water to a minimum of 0.1 micron. A typical water pre-filtration system, such as the one offered by Medivators, filters incoming water through a 1 micron, 0.4 micron, and 0.1 micron series of filters.

- The high performance 0.1 micron (absolute rated) water filter included with the reprocessor is highly effective at removing microorganisms and particles larger than 0.1 microns. Appropriate pre-filtration and regular disinfection are required to maintain the performance of this filter.
- The routine maintenance schedule recommends replacing the 0.1 micron water filter every six months or sooner, depending on the pre-filtration system and the quality of the incoming water. If the filter clogs to the point of non effectiveness, the reprocessor will alarm and will not continue until the filter is replaced.

Detergent Solution

INTERCEPT™ Detergent** must be used in the cleaning phase of the reprocessing cycle. INTERCEPT Detergent is low-foaming and formulated to use with medical instruments. INTERCEPT Detergent has a neutral pH and also bacteriostatic properties to inhibit bacterial growth in the detergent reservoir and detergent lines.

Monitoring Disinfectant Potency

The efficacy of a disinfection procedure is directly related to the disinfectant solution used, and the amount of time the endoscope is exposed to that solution.

- RAPICIDE™ PA High-Level Disinfectant must be monitored for potency every reprocessing cycle according to the instructions in this manual.
- Use the RAPICIDE™ PA Test Strips to test the potency of the solution. If the potency of the solution is below MRC minimum recommended concentration (MRC), discard and replace it with fresh solution.
- Never use disinfectant with unacceptable potency levels.

Disinfectant Solution

Use only with RAPICIDE PA High-Level Disinfectant (Part A & Part B).

Endoscope Cleaning and Testing

The ADVANTAGE PLUS™ Reprocessor may be used with all makes and sizes of flexible, immersible endoscopes that can be internally and externally disinfected. Proper endoscope disinfection is required because endoscopes have multiple internal valves and channels that have the potential to harbor microorganisms that could cross-contaminate patients. Reprocessing quality depends largely on a thorough flushing of all endoscope channels, valves and fittings where contamination can occur.

This reprocessor includes a cleaning cycle that may be used to eliminate manual cleaning of the endoscopes. Used endoscopes must be pre-cleaned according to manufacturers, guidelines and your internal facility procedures before reprocessing. Follow the endoscope manufacturer's, instructions and established professional guidelines while pre-cleaning and disinfecting endoscopes. Leak test all endoscopes prior to disinfection.

If the cleaning cycle is not chosen, endoscopes must be manually cleaned before placing in the reprocessor for disinfection.

INTERCEPT Detergent** has been validated for use in the cleaning cycle. It is recommended that cleaning and reprocessing take place within one hour after the procedure is completed.

**PROTEAZONE™ PLUS Detergent has been validated for use for countries adopting German guidelines*.

PROFESSIONAL GUIDELINES

The following organizations have published recommended guidelines for cleaning and disinfecting endoscopes.

Society of Gastroenterology Nurses and Associates, Inc.
401 North Michigan Ave.
Chicago, IL 60611-4267
USA
Tel: 800-245-7462
Fax: 312-673-6694
www.sgna.org

Assoc. for Professionals in Infection Control and Epidemiology, Inc.
1400 Crystal Drive
Arlington, VA 22202
USA
Tel: 202-789-1890
Fax: 202-789-1899
www.apic.org

American Society for Gastrointestinal Endoscopy
3300 Woodcreek Drive
Downers Grove, IL 60515
USA
Tel: 630-573-0600
Fax: 630-963-8332
www.asge.org

American Society for Testing and Materials
100 Barr Harbor Dr.
West Conshohocken, PA 19428-2959
USA
Tel: 610-832-9585
Fax: 610-832-9555
www.astm.org

Association of periOperative Registered Nurses, Inc.
2170 S. Parker Rd., Suite 400
Denver, CO 80231-5711
USA
Tel: 800-755-2676
Fax: 800-847-0045
www.aorn.org

Canadian Society of Gastroenterology Nurses & Associates
310-4 Cataraqui Street
Kingston, ON K7K 1Z7
CANADA
Tel: 613-507-6130
www.csgna.com

British Society of Gastroenterology
3 St. Andrews Place
Regents Park
London NW1 4LB
ENGLAND
Tel: (+44) (0)20 7935 3150
www.bsg.org.uk

Société Française d'Hygiène Hospitalière S.F.H.H.
Hôpital de la Croix-Rousse
Unité d'Hygiène Hospitalière-Épidémiologie
93 Grande Rue de la Croix-Rousse
69317 Lyon Cdx04
FRANCE
Tél: 04 72 07 19 83
Fax: 04 72 07 19 85
www.sf2h.net

REPROCESSOR SPECIFICATIONS

General Specifications

The basic reprocessor specifications required for installation and operation of the ADVANTAGE PLUS™ Reprocessor are summarized in *Table 1*.

Table 1 Reprocessor Specifications

Equipment Type	Laboratory Equipment
Electrical Rating	100-240 VAC, 50/60 Hz
Power Rating	1000 watts
Air Pressure Range	87 – 145 psi (6 - 10 bar)
Water Pressure Range	35 - 87 psi (2 - 6 bar)
Water Flow Range	2 – 8 liters/minute
Water Temperature Operating Range	20ºC – 40ºC
Humidity Range for Operation	20–80%, non-condensing
Temperature Range for Operation	50°F – 80.6°F (10°C - 27°C)
Environment	Indoor use only
Installation/Over Voltage Category	II
Pollution Degree	2
Connection to Power Supply	Cord connection
Dimensions	45” W X 31” D X 62” H (inches) 114 W X 79 D X 157 H (cm)
Weight	400 lbs. (182 kg)
Altitude	<6561 feet (2000m)
Mains Supply Voltage Fluctuations	Not to exceed ±10% of the nominal voltage
Classification	I, Ordinary Protection
Environmental Rating	Standard
Mode of Operation	Continuous
Degree of Mobility	Stationary
Safety	Conforms to UL STD 61010-1, ENSTD 61010-1, Certified to CSA STD C22.2 No. 61010.1

DIMENSIONS AND CLEARANCES

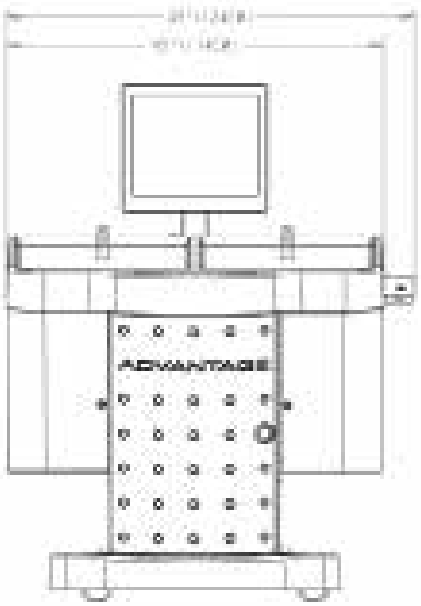


Figure 1 Front Dimensions

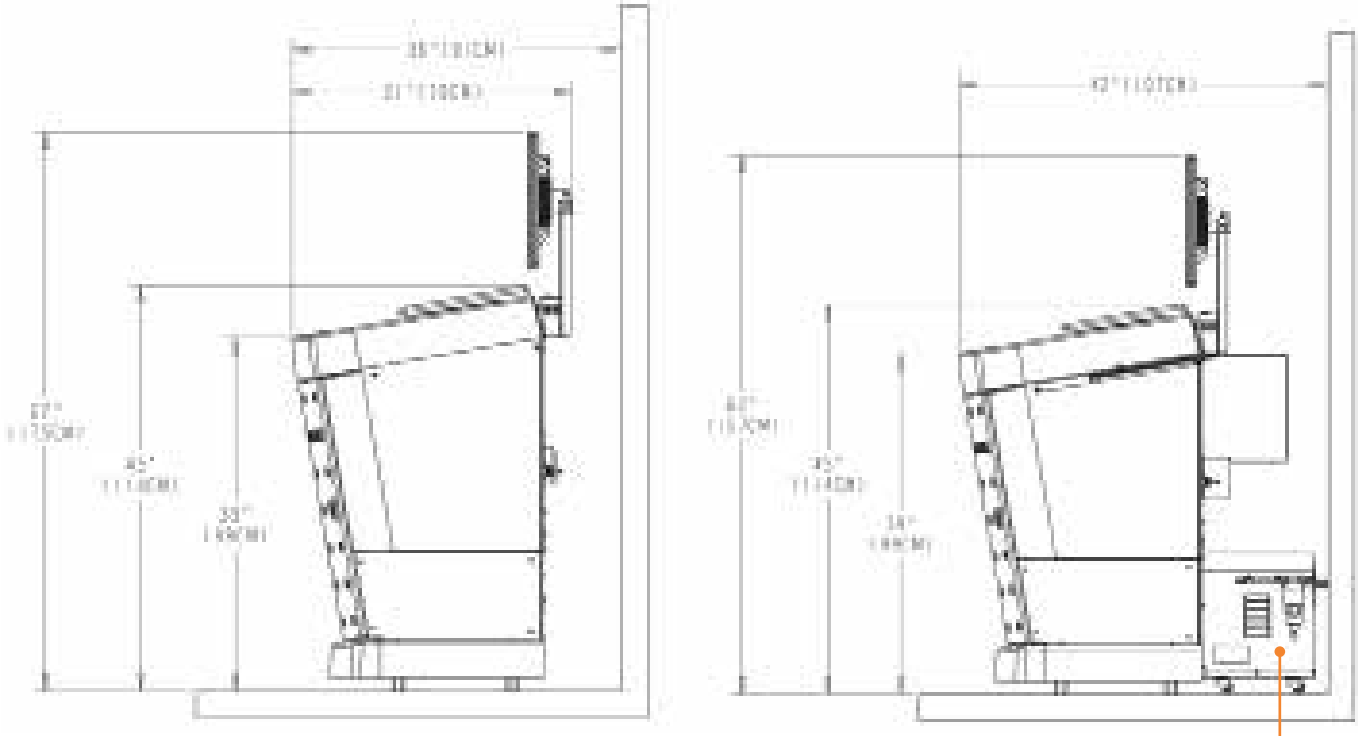


Figure 2 Side Dimensions and Clearance

INSTALLATION SPECIFICATIONS

Electrical

The ADVANTAGE PLUS™ Reprocessor must be connected to a single electrical outlet capable of supplying 1000 watts at 100-240 volts AC, 50/60 Hz. The outlet must be properly grounded.

The external circuits must comply with UL 61010-1 standards. Only use the power cord supplied with the reprocessor. The supplied power cord meets all required standards for use with the unit.

Water

Potable water is the minimum standard. For optimum performance, water must be delivered at a minimum flow rate of 5 L/min (1.32 gpm) at a dynamic pressure of 30 psi (2 bar) during the basin fill. Disinfectant water temperature requirements: RAPICIDE™ PA High-Level Disinfectant 30º : 35º C ± 2º C, RAPICIDE PA High-Level Disinfectant 20º : 25º C ± 2º C, ISASPOR™ SS High-Level Disinfectant : 25º C ± 2º C. The mixing valve must be purchased separately and installed by the facility. A back siphonage prevention device must be purchased separately and installed between the water line and the reprocessor to prevent contamination of the water supply in the event of a sudden drop in water pressure.

Drain

For optimum performance the ADVANTAGE PLUS Reprocessor should be connected to a vented sanitary drain system capable of draining at a minimum rate of 12 L/min (3.17 gpm).

Room Ventilation

The ADVANTAGE PLUS Reprocessor must be installed in a room with a ventilation system capable of delivering a minimum of 10 air exchanges per hour.

An optional vapor management system is available for ductless fume removal.

Air

The ADVANTAGE PLUS Reprocessor must be connected to an air supply for proper operation. The ADVANTAGE PLUS Reprocessor includes an air compressor that requires a dedicated 120 VAC, 20 Ampere service or 230 VAC, 10 Ampere service. The air compressor delivers proper air flows and pressure for correct system operation.

If the ADVANTAGE PLUS Reprocessor model purchased did not include the air compressor, the system may utilize house compressed air (dry, oil free) which must meet these required air pressure specifications: 58 to 125 PSI with a minimum flow volume of 1.5 CFM, maximum particle size is 5 microns, no liquid water in the supplied air stream, maximum oil concentration is 5 mg/m^3.

STORAGE

If the ADVANTAGE PLUS™ Reprocessor will be out of service for an extended period of time, the following steps must be followed:

- Remove the side covers, purge all liquids from the system, and then replace the covers.
- Place a covering over the unit to protect it from dust and moisture.
- The storage temperature must not go below 0°C (32°F), or exceed 60°C (140°F).
- The maximum relative humidity must not exceed 80% during storage.

MOVING THE REPROCESSOR

Before moving the ADVANTAGE PLUS Reprocessor, ensure the electrical cord, drain line, air supply line, network line and water supply line are either disconnected or are appropriate lengths to accommodate the relocation of the machine. Failure to do so may result in damage to the machine.

The ADVANTAGE PLUS Reprocessor can be safely moved on a smooth, level floor. However, if you encounter any thresholds or floor level changes, the base cover must be removed to avoid damage. For all other moves, place the ADVANTAGE PLUS Reprocessor on a pallet with a kraft liner.

While moving the reprocessor, ensure the machine remains in an upright position. Moving or resting the machine in any orientation other than an upright position may result in damage to the machine.

Take precautions to ensure the machine does not tip over which could result in damage to the machine or personal injury. For longer distances, the machine may be placed upon a dolly or pallet. When loading or unloading the machine on or off a dolly or pallet, utilize appropriate lifting equipment or manpower to avoid damage to the machine or personal injury.

Note: To avoid injury or death from an electrical insulation breakdown within the unit, the GFI (ground fault interrupter) circuit breaker should be checked for proper operation on an annual basis.

Note: If during the use of this equipment you see or smell smoke, immediately disconnect the unit from the power supply, discontinue use and Medivators Technical Support at (+31) 45 5 471 444 or your local Medivators Distributor.

Note: Prior to undertaking any service or maintenance operation, or when resetting the GFI, ensure that the reprocessor is disconnected from the main power supply.

Note: If service or maintenance operations are to be conducted on the water system, ensure that the reprocessor is isolated from the main water supply.

WARNING! THE REPROCESSOR MUST BE PROTECTIVELY GROUNDED.

DISPOSAL

Dispose in accordance with local requirements.

SYMBOLS AND ICONS

Symbol	Symbol Meaning	Symbol	Symbol Meaning
	LIO software shortcut		Cancel
	Management software shortcut		Next
	Server software shortcut		Release All
	Expert Operation		Start
	Cancel		Stop
	Menu		Active report, filter applied.
	Open/Close		Edit
	OK/Enter		Expand
	Scroll Down		Export data
	Scroll Up		Filter data
	Start		Generate report
	Stop		Minimize report details
	Import data		New

The icons in the grayed area are only used by Service Personnel.

WARNING SUMMARY

WARNING: PORTABLE AND MOBILE COMMUNICATION DEVICES CAN AFFECT ELECTRICALLY-OPERATED MEDICAL EQUIPMENT.

WARNING: CONNECTING A CHEMICAL CONTAINER WITH THE INCORRECT FLUID MAY CAUSE THE ENDOSCOPE TO BE IMPROPERLY DISINFECTED. DO NOT USE THE ENDOSCOPE ON A PATIENT IF THIS OCCURS.

WARNING: WEAR PERSONAL PROTECTIVE EQUIPMENT (PPE) (CLOTHING, MASK, GLOVES AND EYE WEAR).

WARNING: ALL ENDOSCOPE HOOKUPS MUST BE PERIODICALLY INSPECTED FOR WEAR. DISCARD AND REPLACE DAMAGED HOOKUPS OTHERWISE IT COULD RESULT IN AN ENDOSCOPE THAT IS NOT DISINFECTED AND THEREFORE SHOULD NOT BE USED ON A PATIENT.

WARNING: VERIFY ALL CONNECTIONS TO THE ENDOSCOPE ARE SECURE AND TUBING IS NOT LINKED. FAILURE TO DO SO COULD RESULT IN AN ENDOSCOPE WHICH IS NOT DISINFECTED AND THEREFORE SHOULD NOT BE USED ON A PATIENT.

WARNING: VERIFY THE CONNECTION TUBING DOES NOT INTERFERE WITH THE SPRAY HEAD AND CONFIRM THAT THE SPRAY FUNCTION IS WORKING DURING THE CYCLE. FAILURE TO DO THIS COULD RESULT IN AN ENDOSCOPE THAT IS NOT DISINFECTED AND THEREFORE SHOULD NOT BE USED ON A PATIENT.

WARNING: BEFORE REMOVING THE ENDOSCOPE, VERIFY ALL CONNECTIONS TO THE ENDOSCOPE ARE SECURE. IF AN ADAPTER IS LOOSE OR DISCONNECTED, THE DISINFECTION WAS NOT COMPLETE AND MUST BE REPEATED. FAILURE TO DO SO COULD RESULT IN AN ENDOSCOPE WHICH IS NOT DISINFECTED AND THEREFORE SHOULD NOT BE USED ON A PATIENT.

WARNING: REPORT ALL SYSTEM ERRORS TO YOUR SUPERVISOR.

WARNING: WEAR CLEAN GLOVES TO PREVENT SOILING OF THE DISINFECTED ENDOSCOPE.

IF A RUN ERROR WAS GENERATED, A CHANNEL IS BLOCKED, OR THE ENDOSCOPE IS LEAKING, THE ENDOSCOPE MUST NOT BE RELEASED FOR PATIENT USE. IF THERE IS ANY DOUBT AS TO WHETHER AN ENDOSCOPE IS CORRECTLY DISINFECTED, IT MUST BE DISINFECTED AGAIN BEFORE USE. CONTACT YOUR SUPERVISOR FOR FURTHER INSTRUCTIONS.

VERIFY ALL ENDOSCOPE CONNECTIONS ARE SECURE. FAILURE TO DO SO COULD RESULT IN AN ENDOSCOPE WHICH IS NOT DISINFECTED AND THEREFORE SHOULD NOT BE USED ON A PATIENT.

WARNING: AVOID POSSIBLE CHEMICAL BURNS. WEAR PERSONAL PROTECTIVE EQUIPMENT (CLOTHING, MASK, GLOVES & EYE WEAR).

WARNING: USE ONLY FLUIDS APPROVED BY MEDIVATORS INC.

CHECK THE EXPIRATION DATE OF THE DISINFECTANT IN THE REPROCESSOR EACH DAY.

NEVER USE DISINFECTANT BEYOND THE MANUFACTURER'S EXPIRATION DATE, EVEN IF THE MRC LEVEL IS ACCEPTABLE.

NEVER USE DISINFECTANT THAT TESTS BELOW THE ACCEPTABLE MRC LEVEL, EVEN IF IT HAS NOT YET REACHED THE EXPIRATION DATE.

WHEN REPLACING DISINFECTANT, WEAR PERSONAL PROTECTIVE EQUIPMENT (CLOTHING, MASK, GLOVES & EYE WEAR). THE DISINFECTANT AND DETERGENT MANUFACTURERS MAY RECOMMEND ADDITIONAL PROTECTION.

IF LEAKING LIQUID IS PRESENT AND YOU SUSPECT IT IS DISINFECTANT, READ AND FOLLOW THE DISINFECTANT INSTRUCTIONS BEFORE ATTEMPTING A CLEANUP.

WARNING: ENSURE THAT THE REPROCESSOR IS INSTALLED AND MAINTAINED IN A POSITION THAT ALLOWS ACCESS TO THE POWER CORD FOR EMERGENCY DISCONNECTION IF NECESSARY.

NEVER USE THE EQUIPMENT IN A MANNER INCONSISTENT WITH THE MANUFACTURER'S GUIDELINES. USING THE EQUIPMENT IN A MANNER INCONSISTENT WITH THE MANUFACTURER'S GUIDELINES MAY IMPAIR THE PROTECTIONS THAT ARE DESIGNED INTO THE DEVICE AND MAY CAUSE INJURY TO THE USER.

RAPICIDE™ PA HIGH-LEVEL DISINFECTANT CONTAINERS MUST BE TRIPLE RINSED BEFORE DISPOSAL.

CHAPTER 2

OPERATOR CONTROLS

This chapter describes the ADVANTAGE PLUS™ Reprocessor operator controls, and how to set up and program the reprocessor.

MAIN COMPONENTS

Exterior Components

The ADVANTAGE PLUS™ Reprocessor consists of two independent reprocessing modules. Each has a basin, automatic cover, endoscope hookups, and the necessary pumps and valves clean to disinfect, rinse, and dry most models of flexible, immersible endoscopes.

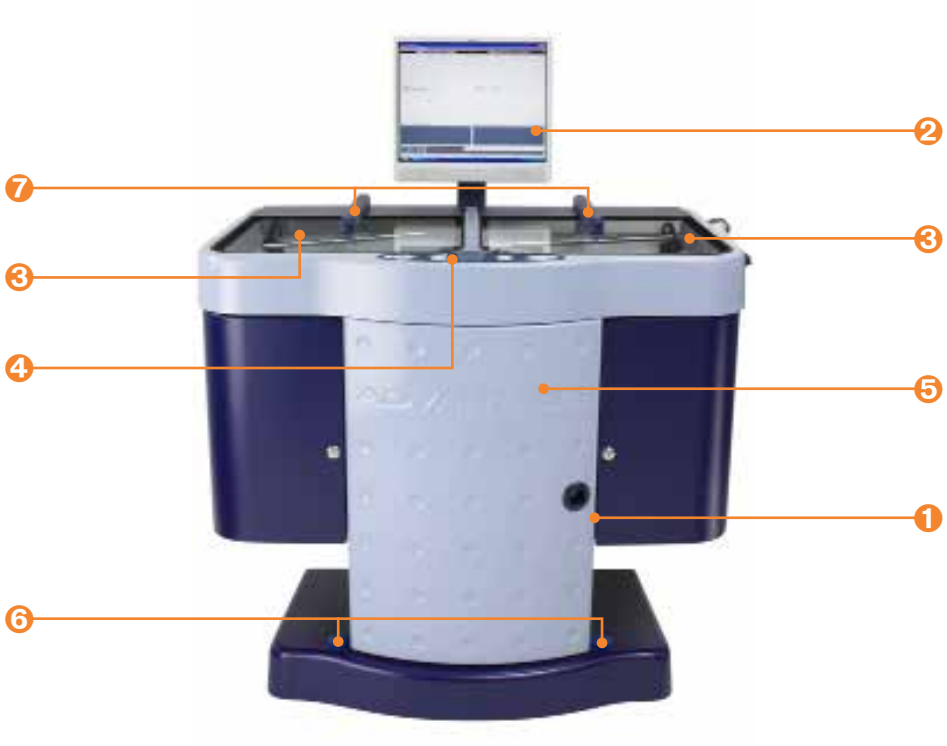


Figure 1 ADVANTAGE PLUS™ Reprocessor Front View

1. **PC:** Runs the programs on the ADVANTAGE PLUS Reprocessor that disinfect the machine and endoscopes.
2. **PC Monitor:** Displays messages, menu selections, and the operational status.
3. **Basin Lid:** Cover for the left or right basin of the ADVANTAGE PLUS Reprocessor. Open the lid to add or remove endoscopes.
4. **Control Panel:** Used to select settings, operate the reprocessor, and view system messages, errors and warnings.
5. **Access Door:** Opens to allow access to the reservoirs, filters, transfer valves, and pressure gauges.
6. **Foot Switch:** Pressing the right foot switch opens the right basin lid, and pressing the left foot switch opens the left basin lid.
7. **Spray Arm Feeds:** Provides the fluid to the spray arms.

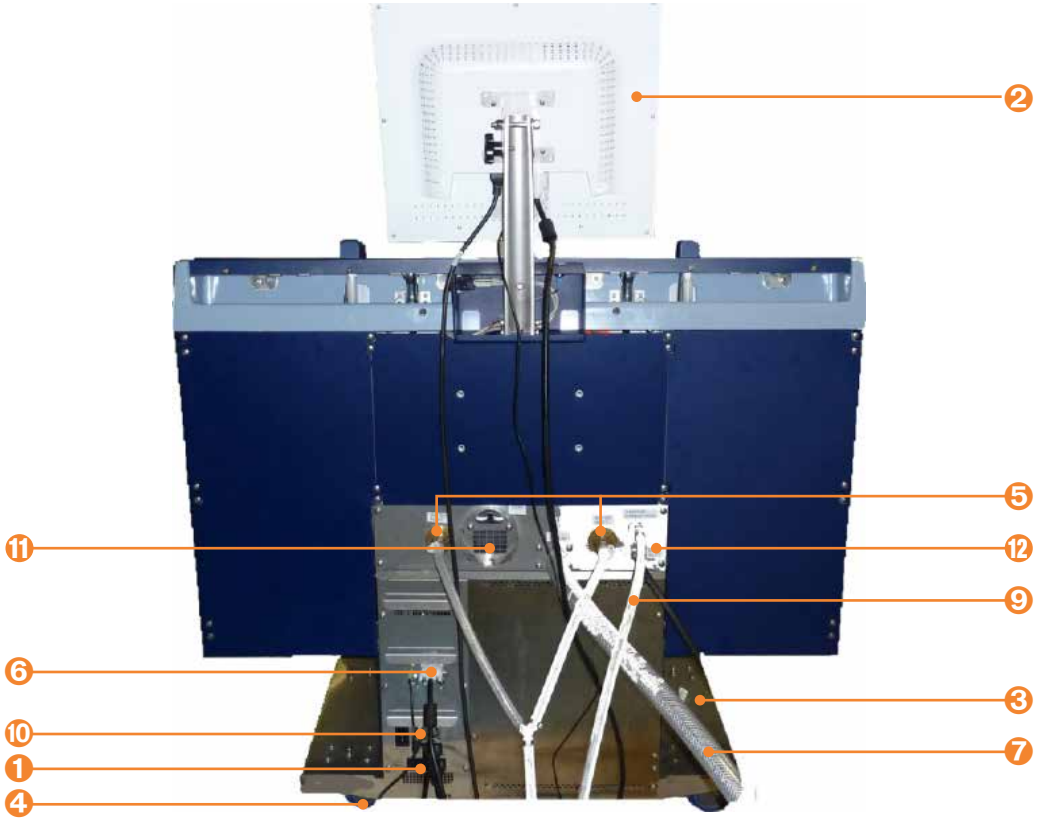


Figure 2 ADVANTAGE PLUS™ Reprocessor AER Back View

1. **PC:** Runs the programs on the ADVANTAGE PLUS™ Reprocessor that disinfect the reprocessor and endoscopes.
2. **PC Monitor:** Displays messages, menu selections, and the operation status.
3. **Base Shroud:** Covers and protects the bottom of the ADVANTAGE PLUS Reprocessor.
4. **Castors:** Wheels which make the ADVANTAGE PLUS Reprocessor easier to move. Caster wheels can be locked.
5. **Water Supply Inputs:** Inlet for filtered water, one for each module (3/8" barb fitting with hose clamp, provided).
6. **System Power:** Electrical power supply connection.
7. **Discharge:** Fluids output to the drain (1" barb fitting).
8. **On-Board Air Compressor (Optional accessory not shown):** provides pressurized air to the system in the event that a pressurized air line from the facility is not available.
9. **Compressed Air Hookup:** Connects with facility pressured air line, if on-board air compressor accessory is not purchased (1/4" NPT).
10. **Circuit Breaker/Power Switch:** Toggle switch turns ADVANTAGE PLUS Reprocessor on and off.
11. **Vent:** Exhausts internal chemical vapor build-up.
12. **Self-Disinfection Port:** Connects to water line filtration system for water line disinfection.

Interior Components

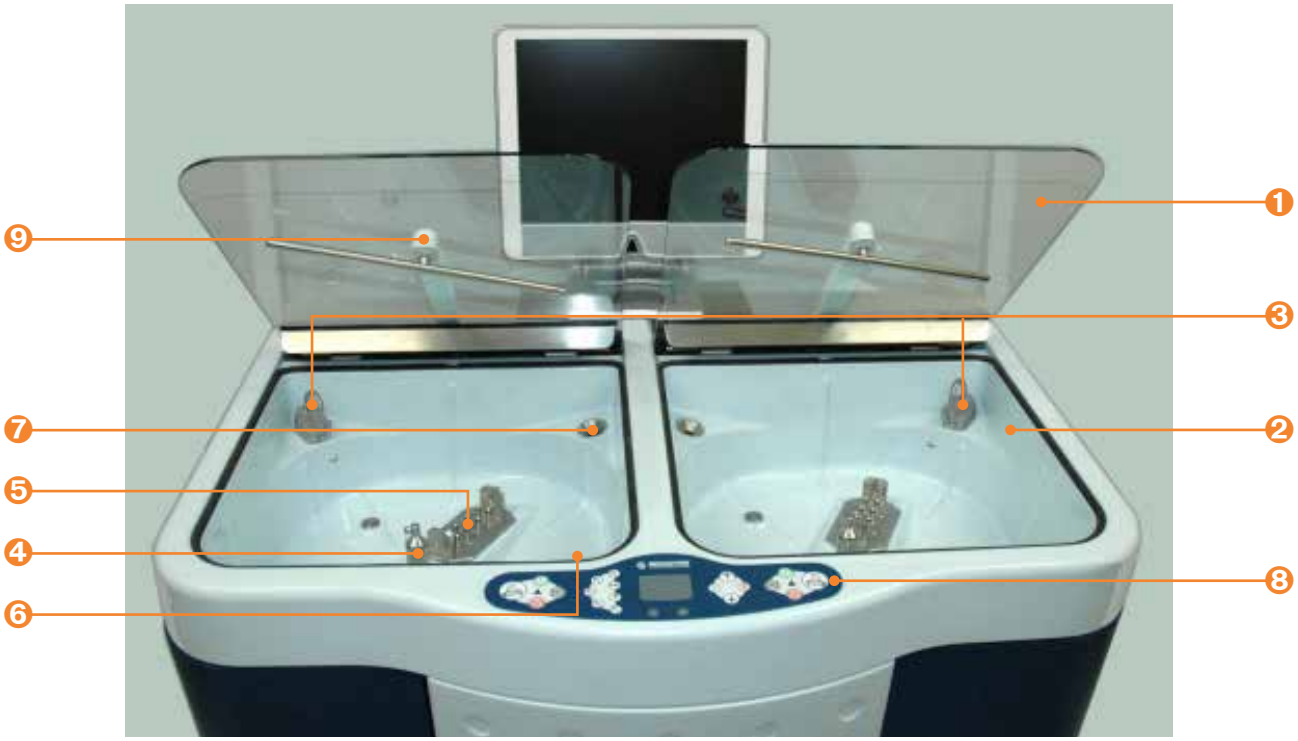


Figure 3 ADVANTAGE PLUS™ Reprocessor Top View

1. **Basin Lid:** Cover for the left or right basin of the ADVANTAGE PLUS™ Reprocessor. Open the cover to load or remove endoscopes.
2. **Basin:** Containers where endoscopes are reprocessed.
3. **Fluid Inlet:** Port where liquids are dispensed into the basin.
4. **Spray Head:** Disperses a fine jet of fluid into the basin.
5. **Connection Manifold:** Attaches endoscope hookup block to the system.
6. **Drain:** Outlet port through which waste fluids are discarded.
7. **Overflow:** Outlet used to drain off excess fluids.
8. **Control Panel:** Used to select settings, operate the reprocessor, and view system messages, errors and warnings.
9. **Spray Arm:** Provides fluid spray for disinfection and rinsing of exterior surfaces of endoscopes.

Figure 4 Chemical Reservoirs

1. **Main (High) Pressure Gauge:** Measures air pressure in the ADVANTAGE PLUS™ Reprocessor. Must be set to 3 bar (45 psi). Only to be adjusted by trained Medivators technicians.
2. **Disinfectant Container:** Holds disinfectant Part A used in the disinfection process.
3. **Disinfectant Container:** Holds disinfectant Part B used in the disinfection process.
4. **Detergent Reservoir:** Holds detergent used in the wash process.
5. **Alcohol Reservoir:** Holds alcohol that may be used in the alcohol/air purge process.
6. **Leak Test (Low) Pressure Gauge:** Measures air pressure in the endoscope sheath and MDS system. Must be set to 0.25 bar (3.75 psi). Only to be adjusted by trained Medivators technicians.
7. **Sample Ports:** Dispenses RAPICIDE™ PA High-Level Disinfectant for MRC testing at the end of each cycle.

PC Monitor and Connections

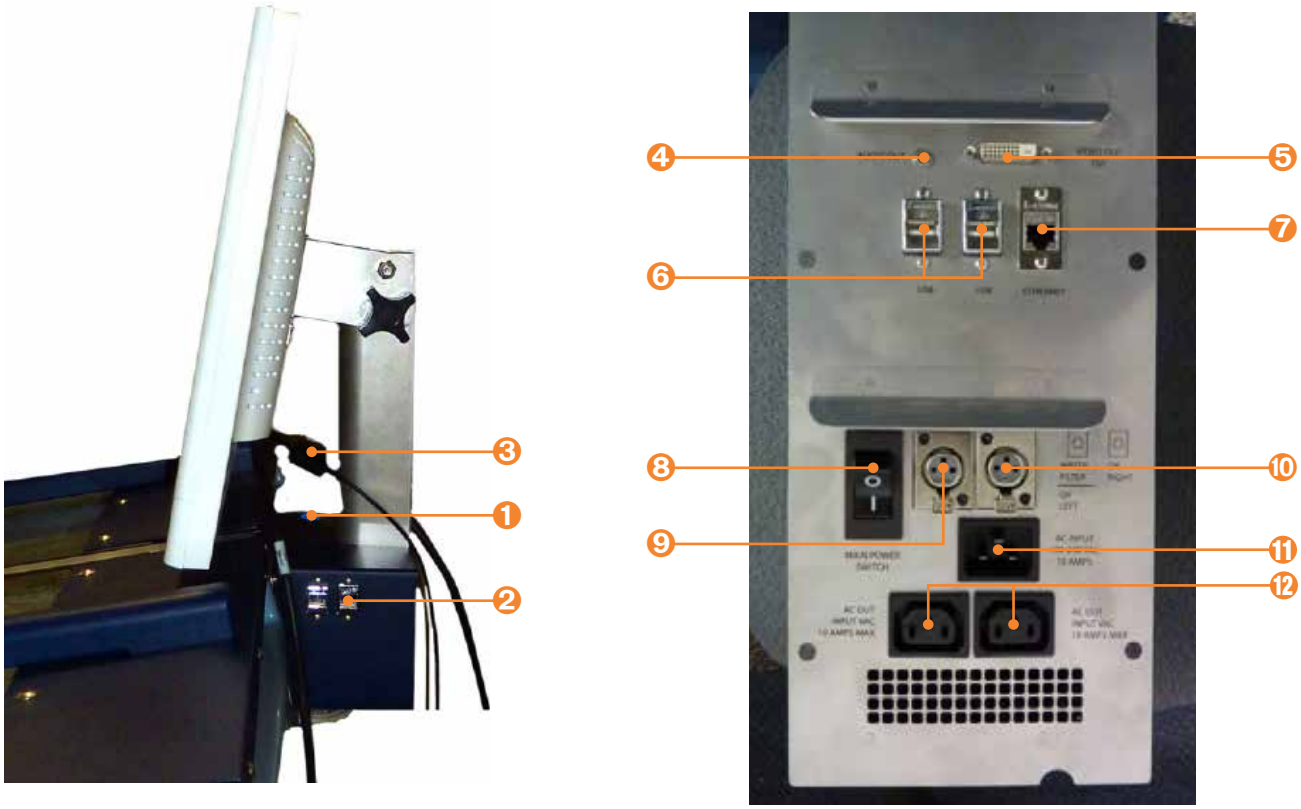


Figure 5 PC Monitor and Connections

1. **On/Off Switch:** Turns the computer on or off.
2. **USB Ports:** Connector between the PC and external peripherals, (i.e. mouse and keyboard).
3. **Power Connection:** Bottom of monitor in back (not shown).
4. **Audio Out:** Audio output connector for connection to monitor.
5. **Video Out DVI:** DVI-I connector fro connection to monitor.
6. **USB:** Extra USB connection for accessories (Printer or Barcode scanner).
7. **Ethernet:** Ethernet connection for Network or internet.
8. **Main Power Switch:** 10 Amp breaker with integrated main power switch.
9. **Water Filter/OX Left:** Low voltage output for connection to Water Filter System or left side of Sterilox Control Box.
10. **OX Right:** Low voltage output for connection to right side of Sterilox Control Box.
11. **AC Input:** IEC 60320 C20 Inlet connector for Main input power connection.
12. **AC Out:** IEC 60320 C13 outlet connector for accessory power.

Control Panel

The control panel allows the operator to select settings, operate the reprocessor, and view system messages, errors and warnings, and cycle information. It consists of five main groups:

1. Left and right basin control buttons
2. Function buttons
3. Touchpad and mouse buttons
4. Selection buttons
5. Left and right basin LED lights

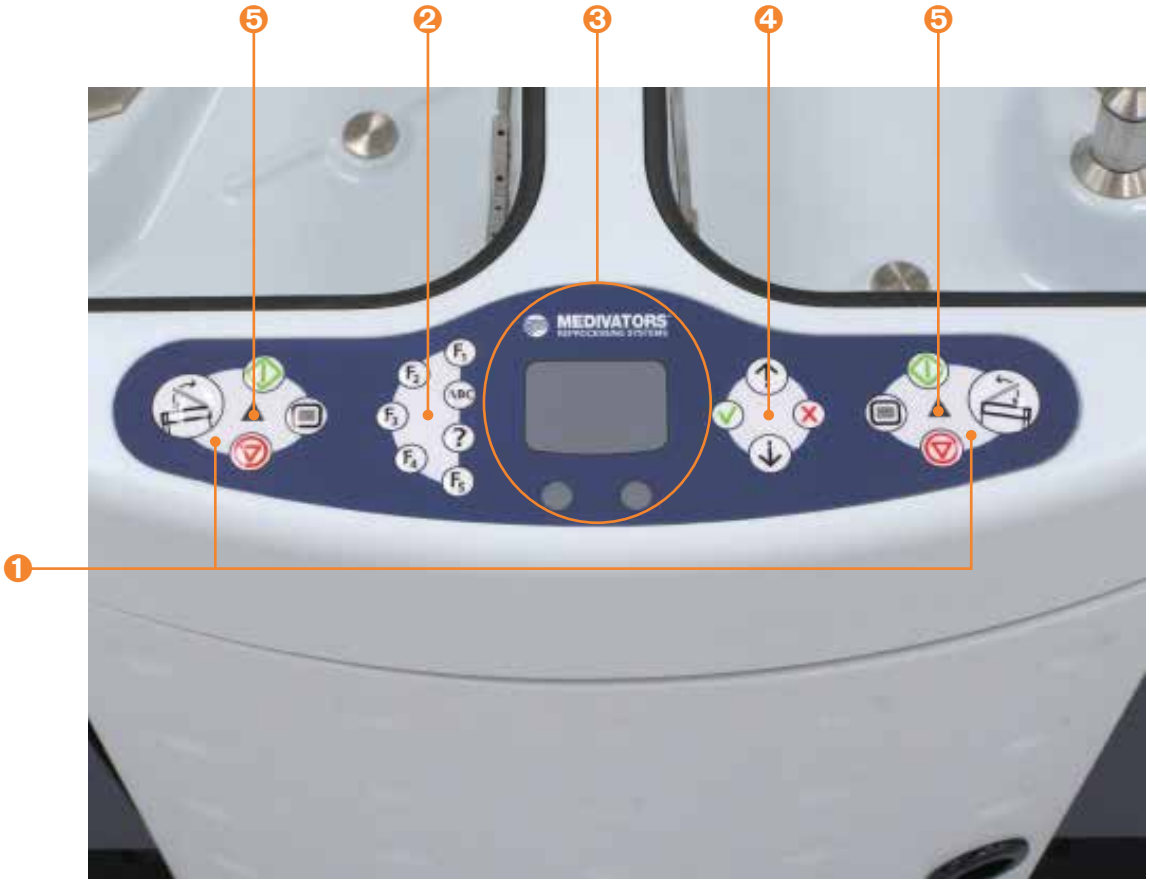


Figure 6 Control Panel

Basin Control Buttons

Each module is controlled by its own keypad grouping. The group shown in *Figure 7* is for the right module.

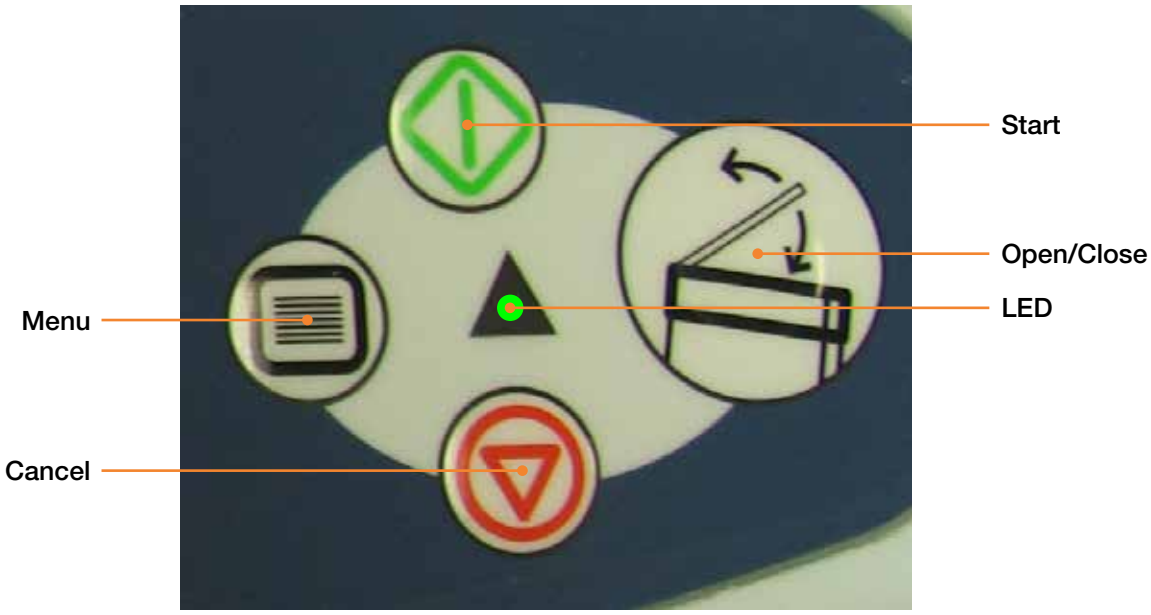


Figure 7 Basin Control Buttons

- Press the **Open/Close** button to open or close the lid on the basin. Note that during disinfection, the lids will not open.
- Press the **Start** button to start a disinfection program. The button is also used to restart a program after an error.
- Press the **Cancel** button whenever you have a reason to stop a disinfection program. If disinfectant is in contact with the endoscope when the button is pressed, the program will run until conditions are safe.
- Press the **Menu** button to log in, select programs, and enter data.
- The green LED will display when system is operating normally, LED flashes green upon cycle completion. If LED is red, system error has occurred. Verify the error condition. The endoscope may not be disinfected. Do not use.

Touchpad and Mouse Buttons

Figure 8 Touchpad and Buttons

The touchpad works as a mouse to enter information. Moving your finger on the pad causes the cursor to move on the monitor. Tapping the touchpad or pressing the left button has the same result as clicking the left button on a mouse. The two buttons correspond to the left and right buttons on a mouse.

Function Buttons

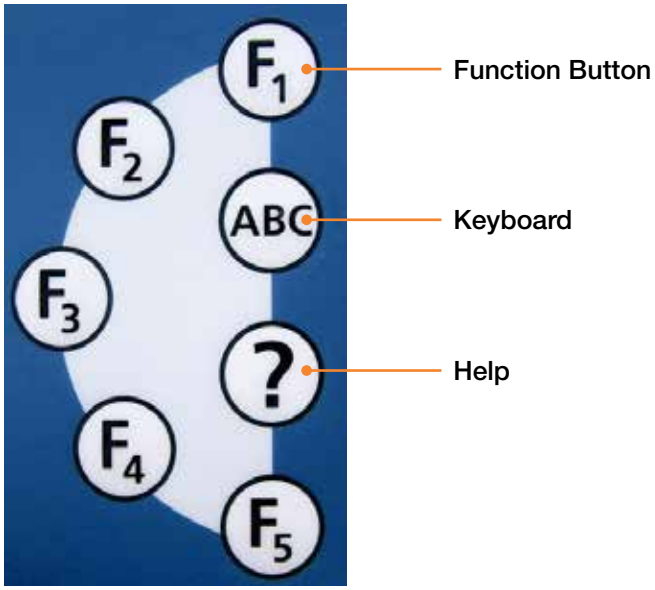


Figure 9 Function Buttons

Table 1 Function Buttons

Function Key	Press Button (No. of times)	Result
F1	1	I/O Inputs / Outputs
Left Basin		
F1	2	I/O Inputs / Outputs
Right Basin		
F1	3	I/O Inputs / Outputs
Both Basins		
F1	4	Re-opens program window.
F2	—	—
F3	1	Opens system parameters. Press again to close.
F4	1	History report for the current day. Press again to close.
F5	—	—
ABC	1	Get keyboard to appear on the monitor.
ABC	2	Close keyboard screen.
Help (?)	—	—

Selection Buttons

- Pressing the **OK** button is the same as clicking on the OK button in the software.
- The **Cancel** button corresponds to the Cancel button in the software.
- Pressing the **Scroll Up** button allows you to scroll up through a list on the monitor.
- Pressing the **Scroll Down** button allows you to scroll down through a list on the monitor.

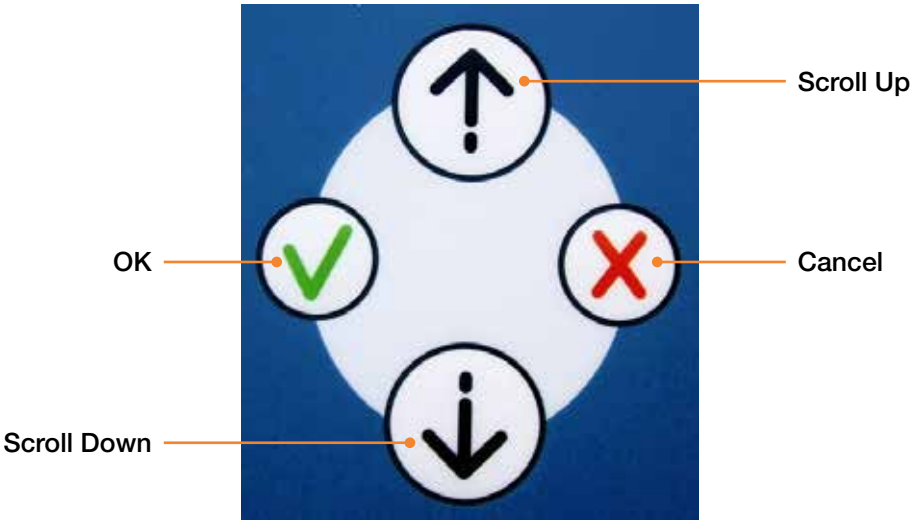


Figure 10 Selection Keys

Connector Blocks

The endoscope channels are connected to the ADVANTAGE PLUS™ Reprocessor channel manifold via a connector block. Each endoscope model requires a unique connector block to ensure that proper disinfection can be achieved. Refer to the hookup application guide to identify the correct connector block to use for the endoscope to be reprocessed.

Note: Before a new type of endoscope is reprocessed or if you have any questions about a connection block, contact your field service representative.

Accessories

Endoscope accessories, buttons and valves may be disinfected in ADVANTAGE PLUS Reprocessor. Use the provided mesh bag.

Data Entry

Barcode Reader

A barcode scanner can be used to automatically enter data rather than manually entering it with the control panel. The system administrator may define a list for any of the following items:

- Operator login name
- Endoscope code
- Doctor/specialist ID
- Assistant ID
- Patient number

Figure 11 Barcode Reader for Operator Login and Endoscope ID

SOFTWARE SYSTEM

Available Programs

Three separate programs control the ADVANTAGE PLUS™ Reprocessor:

1. **LIO (Logic Input/Output)** is the main software program that operators use to perform and run an endoscope cycle. This part of the software controls the ADVANTAGE PLUS Reprocessor and is what runs and displays on the PC monitor. This program is used most often by daily operators of the reprocessor.
2. **Management** is the software program for managing endoscopes, users and cycle information. It allows an administrator access to input data, process reports, and can manage multiple ADVANTAGE PLUS Reprocessors.
3. **PrintService** automatically prints a certificate to the cycle log printer which is dedicated to each reprocessor. The certificate contains system information and reprocessing cycle details pertaining to a specific reprocessing cycle.

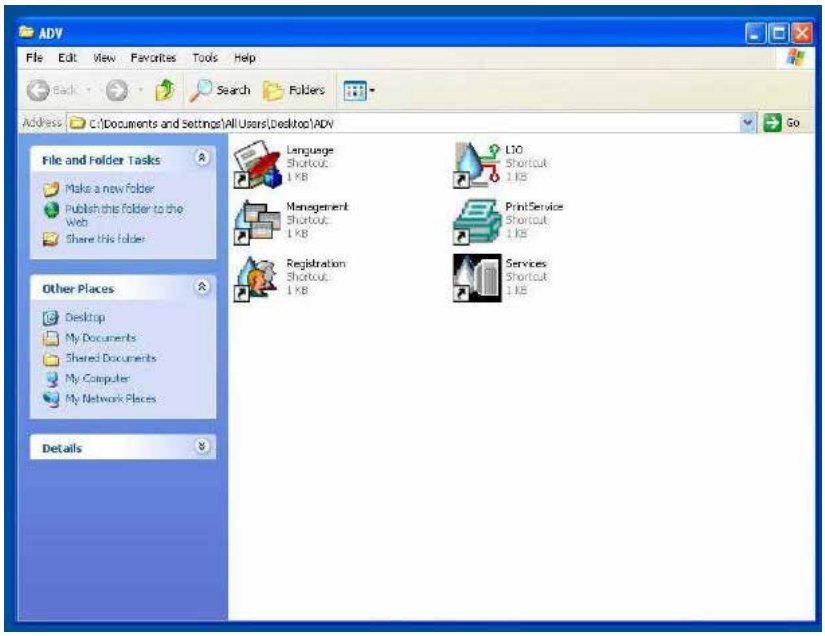


Figure 12 ADVANTAGE PLUS™ Reprocessor Programs

Re-Starting LIO

Before using the **LIO** software, you should have a working knowledge of PC computers and the Windows operating system. Make sure you know how to use the control panel, including the touchpad and its buttons. If you are uncertain how to proceed, contact your supervisor or the system administrator for assistance. **LIO** and the server are initiated during normal PC power up.

1. Verify the PC is on, Windows is running.
2. Find the ADVANTAGE PLUS™ Reprocessor folder on the Windows desktop and double-click on it. It is titled **ADV**.

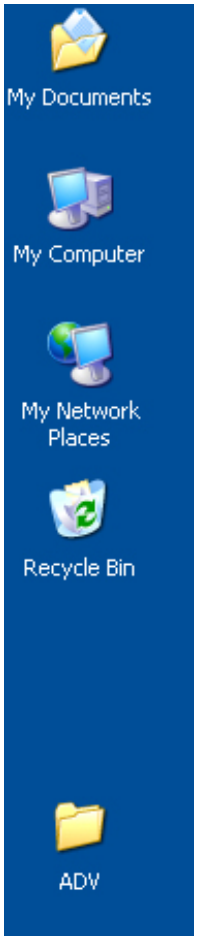


Figure 13 ADVANTAGE PLUS™ Reprocessor Folder on the Desktop

3. Double-click on the **LIO** icon to start the ADVANTAGE PLUS™ Reprocessor operational program.
4. Double-click the **PrintService** icon to start the cycle log print service.

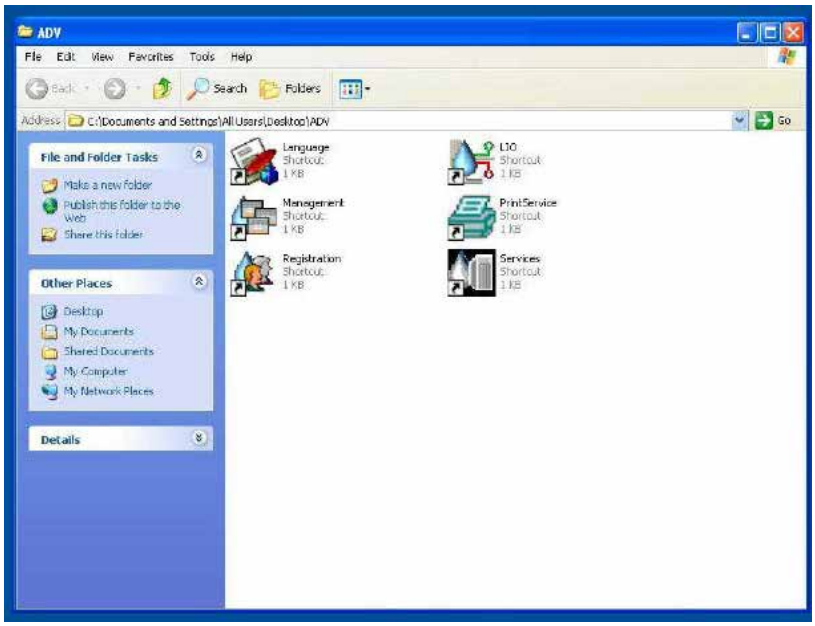


Figure 14 LIO in the ADVANTAGE PLUS™ Reprocessor Window

User Screen

The monitor displays all necessary information for operating and maintaining the ADVANTAGE PLUS™ Reprocessor. Use the buttons on the control panel, to access different screens, programs and functions.

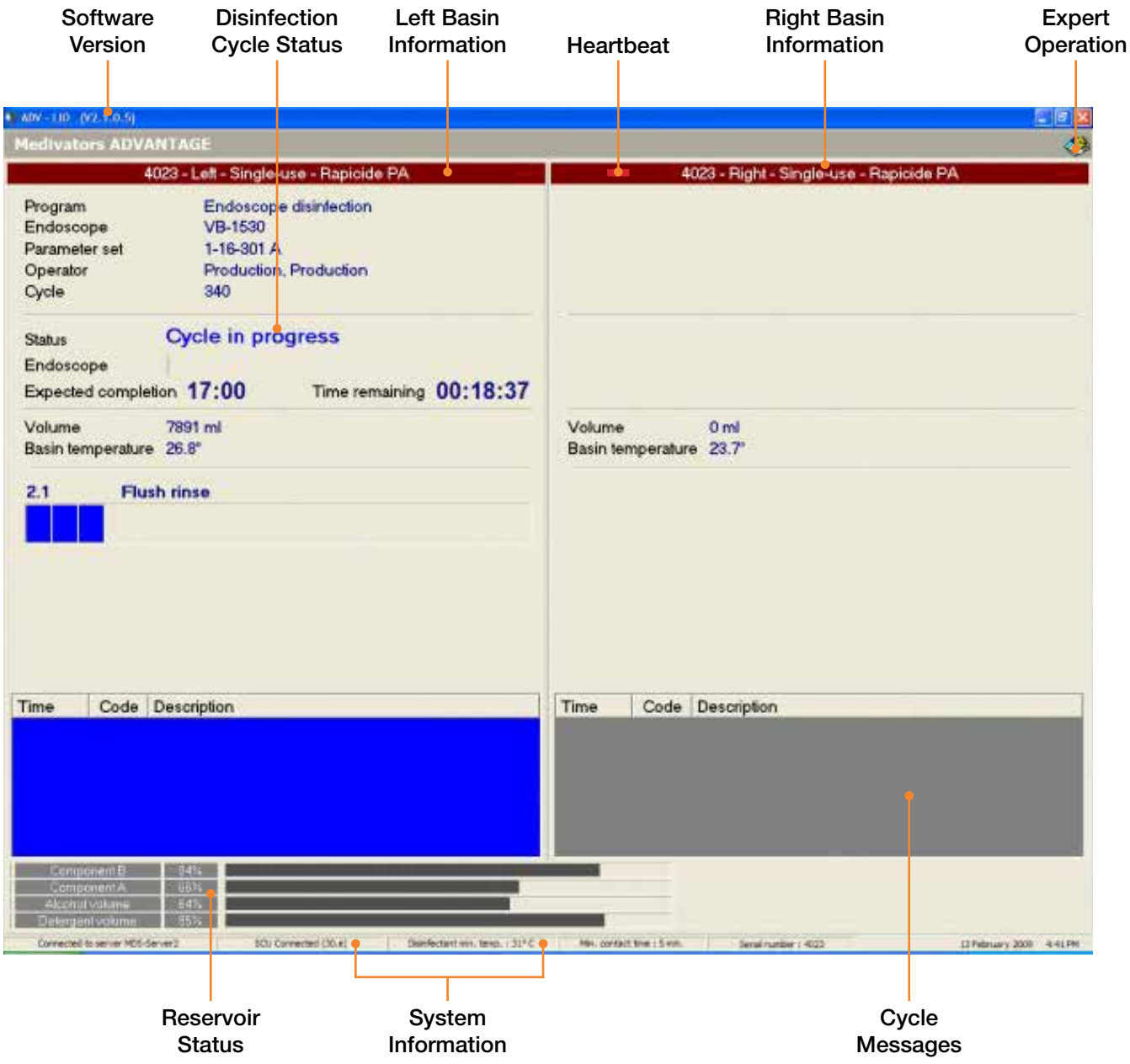


Figure 15 Typical Program Screen

Menu Bar

Each program has a separate release version shown in the upper left corner of the screen. If a system error occurs, a red message bar appears here until the error is resolved.

The **Expert Operation** icon appears in the upper right of the menu bar. Double-clicking the icon will display a login dialog box. After logging in, a side bar is displayed on the left with the following icons. **Expert Operation** is only available to operators with the correct level of user rights.

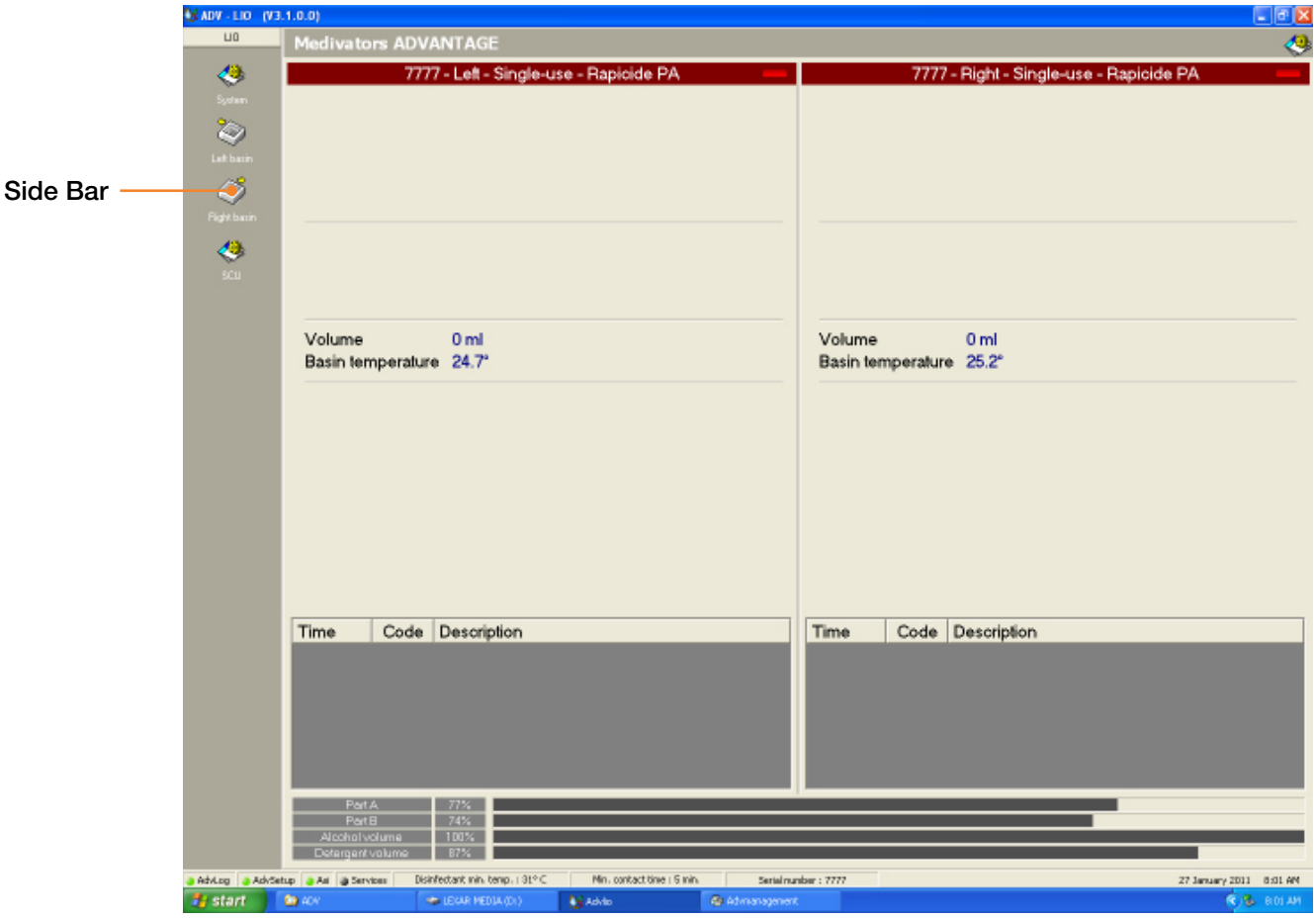


Figure 16 Side Bar with Icons

Module and Program Status

The status of each module is indicated in the main section of the screen. Program operations for the left module are on the left side of the screen; operations for the right module are on the right side of the screen.

Running program operations for each module are indicated in the section. The information provided includes:

- Operator name
- Endoscope ID
- Program name
- Parameter set
- Number of cycles
- Program status
- Expected run time
- Run time remaining
- Volume
- Temperature
- Program progress bar
- Phase progress bar
- Step progress bar
- Cycle messages

Heartbeat

The red heartbeat indicator blinks on and off to show that the current program is active. Each module has a heartbeat indicator.

Program Messages

Program messages and operator instructions are shown in the lower section of the screen. The messages are presented with text and color. If an error occurs, an audible alarm also sounds.

The text shows the program time elapsed at which the message occurred, the message code, and a description of the message or instructions for the operator to follow. For troubleshooting purposes, the message codes and additional message details are listed in *Chapter 5 Troubleshooting*. The meaning of each screen color is shown in *Table 2*.

Table 2 Screen Color and Program Status

	Screen Color	Program Status
1	Gray	Program in standby
2	Orange	Standby, with lid open or a warning is present
3	Blue	Cycle in process
4	Red	Error or Cycle Failed, endoscope not disinfected
5	Green	Cycle completed successfully, endoscope disinfected

Reservoir Status

The percentage of alcohol and detergent remaining in the reservoirs is provided at the bottom of the screen.

System Information

The bar at the bottom of the screen provides system communication information, reprocessor identification, and the software version for your selected language.

ADVANTAGE PLUS™ Reprocessor software has two possible system connections:

1. ADVANTAGE PLUS Reprocessor PC to the ADVANTAGE PLUS Reprocessor (SCU).
2. ADVANTAGE PLUS Reprocessor PC to a server application (may be networked).

The left field on the bar indicates if the reprocessor is connected to a server. The next field to the right indicates if the PC is correctly connected to the reprocessor SCU. If the PC is disconnected the field appears red.

Login Name and Password

Many processes on the ADVANTAGE PLUS™ Reprocessor require you to supply a login name and password. This confirms that you have the proper authorization to run each program. Data gathered from each process, including the operator's name, is stored in the database and printed on reports.

To enter your login name, move the cursor to the window. Press the down arrow on the right side and scroll down until your login name is highlighted. Click on the name to select it.

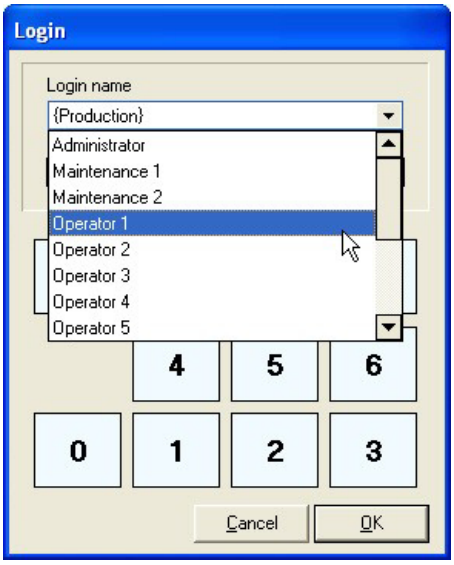


Figure 17 Login Name Selection

To enter your password, click on the appropriate numeric buttons in the window. If you enter an incorrect password, click the **CLR** button and enter the password again. Press the **OK** button to continue.

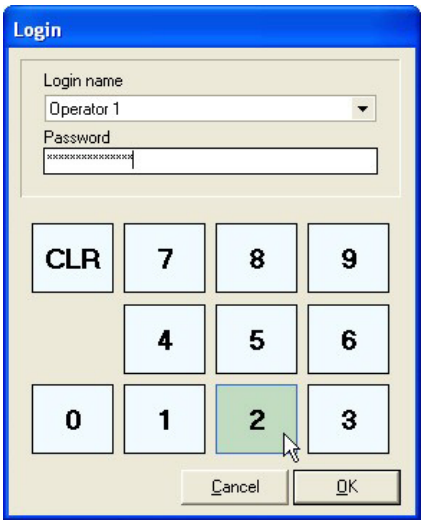


Figure 18 Password Entry

PRINTING

PrintService Utility

1. Check for the **Printer** icon in the system tray. The **PrintService** utility supports the printing of the Cycle Logs on the certificate printer.

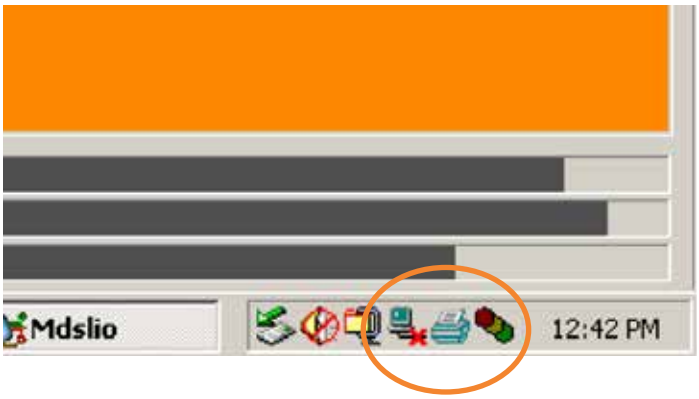


Figure 19 System Tray

2. If the icon is not present, display the Windows desktop by minimizing all open programs.
3. Open the ADVANTAGE PLUS™ Reprocessor folder by double-clicking the **ADV** icon.

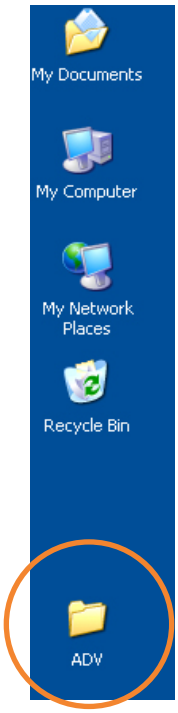


Figure 20 Desktop Detail

4. Double-click on the **PrintService** icon.

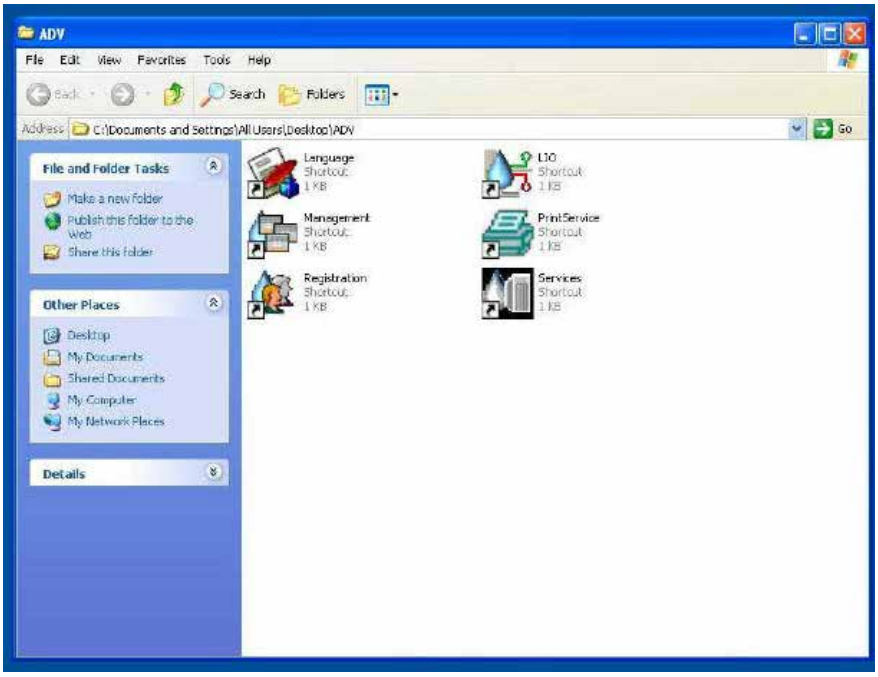


Figure 21 ADVANTAGE PLUS™ Reprocessor Folder

5. The **PrintService** icon should now appear in the System Tray.

Set the Default Printer

1. Click on Start > Settings > Printers.

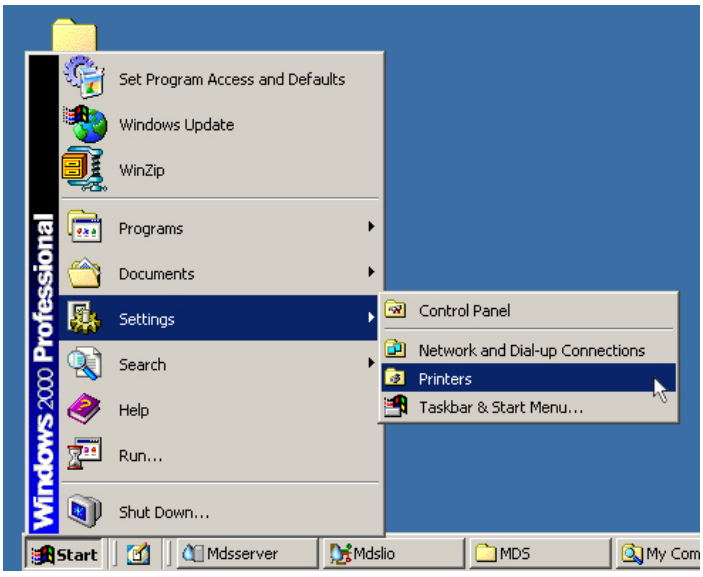


Figure 22 Printer Selection

2. Double-click the icon for your cycle log printer.
3. In the dialog box for the printer, double-click on **Set As Default Printer**. A checkmark appears above the **Printer** icon and in the submenu the next time it is accessed.

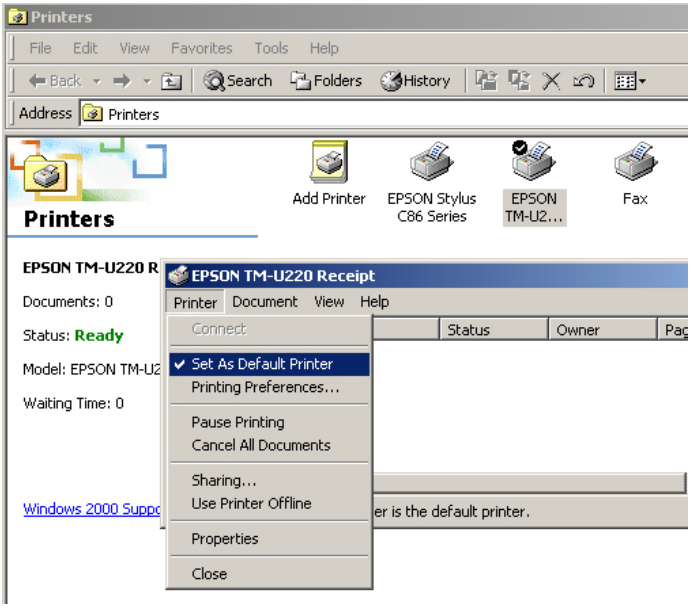


Figure 23 Set As Default Printer

BACKUPS

The computer on the ADVANTAGE PLUS™ Reprocessor is equipped with mirrored hard drives. Mirrored hard drives consist of a main hard drive and a second hard drive which contains an exact copy of the first hard drive. This configuration provides a backup of the entire computer system.

The ADVANTAGE PLUS Reprocessor uses MICROSOFT SQL Server 2008 Express to generate the database files.

The databases should be backed up on a regular basis. Although the mirrored hard drives do provide protection against a single hard drive failure, regular backups of the database to a remote location (CD, memory stick or remote server) will protect against database corruption or complete system failure. Follow the procedures established by your facility for scheduling and storing backups.

Medivators provides a backup utility, **SQLBackupAndFTP**, preinstalled on the ADVANTAGE PLUS Reprocessor. This utility must be configured.

FLUID SYSTEM

Fluid Reservoir Status

The system monitors the use of disinfectant, alcohol, and detergent. The percentage of fluid remaining appears in the footer of all screens.

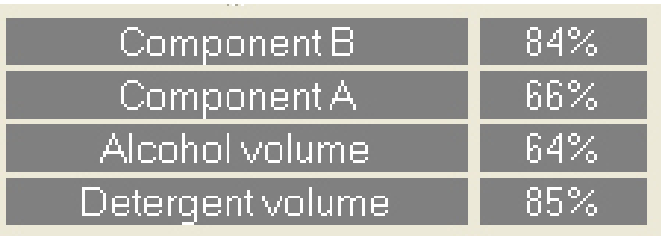


Figure 24 Reservoir Levels

WARNING: REFILLING THE CONTAINER WITH THE INCORRECT FLUID MAY CAUSE THE ENDOSCOPE TO BE IMPROPERLY DISINFECTED. DO NOT USE THE ENDOSCOPE ON A PATIENT IF THIS OCCURS.

WEAR PROTECTIVE CLOTHING, GLOVES AND EYE WEAR. THE DISINFECTANT AND DETERGENT MANUFACTURERS MAY RECOMMEND ADDITIONAL PROTECTION.

If the fluid reservoir status indicates that the detergent or alcohol volume is low, then you must follow the alcohol or detergent loading process to fill the appropriate fluid reservoir.

Note: A program does not stop if a 0% volume level is reached during a cycle. An error message appears and you must replace the fluids.

The fluid levels in the detergent and alcohol reservoirs are monitored with float switches. A cycle cannot be initiated if sufficient fluid is not available. The **Replace Fluid** utilities must be run once out of fluid is detected even though the reservoirs have been refilled.

Detergent and Alcohol (Optional)

The detergent and alcohol reservoirs serve both the left and right modules. Each reservoir is threaded into a captive header and is removed by unscrewing the body. The alcohol must be 70% isopropyl. The detergent must be detergent manufactured by Cantel Medical Corp.

Figure 25 Alcohol and Detergent Reservoirs

Note: Upon refilling of the detergent or alcohol reservoirs, the **Replace Fluids** Utility must be run. If a container empty condition has been detected, the **Replace Fluids** utility must be run to correct the error condition.

Because the two reservoirs are identical, you must pay attention to the labeling to ensure that the correct fluid is in each reservoir. To prevent errors, complete refilling one reservoir before removing the other.

WARNING: TO PREVENT THE ACCIDENTAL SWITCHING OF THE ALCOHOL AND DETERGENT RESERVOIRS ALWAYS REMOVE, REFILL AND REPLACE EACH RESERVOIR BOTTLE SEPARATELY. RETURN THE RESERVOIR (BOTTLE) TO ITS ORIGINAL POSITION BY MATCHING UP THE RESERVOIR LABEL TO THE LABEL ABOVE THE RESERVOIR HEADER.

WARNING: REFILLING THE CONTAINER WITH THE INCORRECT FLUID MAY CAUSE THE ENDOSCOPE TO BE IMPROPERLY DISINFECTED. DO NOT USE THE ENDOSCOPE ON A PATIENT IF THIS OCCURS.

WEAR PERSONAL PROTECTIVE EQUIPMENT (CLOTHING, MASK, GLOVES AND EYE WEAR). THE DISINFECTANT AND DETERGENT MANUFACTURERS MAY RECOMMEND ADDITIONAL PROTECTION.

Disinfectant

RAPICIDE™ PA High-Level Disinfectant Part A and Part B

The two disinfectant containers serve both the left and right modules. One container holds Part A while the other container holds Part B of the disinfectant solutions. The ADVANTAGE PLUS™ Reprocessor automatically mixes the two parts with water at the appropriate time during the disinfection cycle.

Note: Upon replacing RAPICIDE™ PA High-Level Disinfectant Part A and B containers, the **Replace Fluids** utility must be run. A reprocessing cycle cannot be initiated if an out of disinfectant has been detected. The **Replace Fluids** utility must be run to clear the error condition.

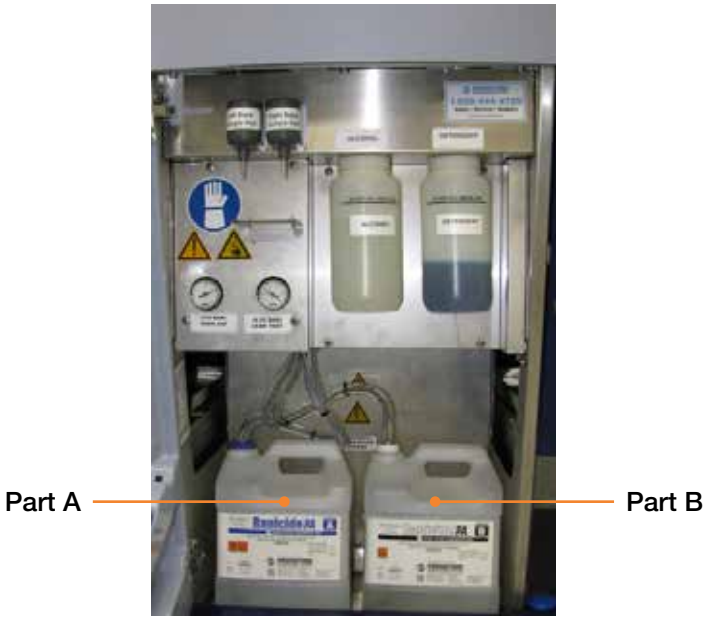


Figure 26 Parts A and B

Part A uses a blue cap, and is positioned to the left as you look into the front of the ADVANTAGE PLUS Reprocessor. Part B uses a white cap, and is positioned to the right as you look into the front of the ADVANTAGE PLUS Reprocessor. Part A and B must always be positioned in the correct location in the machine, and must always be attached to the appropriately colored cap. To facilitate the correct connection, the blue cap is larger than the white cap, and only fits the Part A container. The smaller white cap only fits the Part B container.

Contact Time

Prior to replacing Part A or B the **Replace Fluids** utility must be run. Information from the containers is required. The disinfectant contact time and disinfectant temperature is pre-set during manufacturing. The contact time and temperature field is not configurable.

WARNING: USE ONLY CLEANING AND DISINFECTANT FLUIDS APPROVED BY MEDIVATORS INC.

Water Line Disinfection

Chemical disinfection of the water treatment (filtration) and delivery system must be performed on a weekly basis and whenever the 0.1 micron absolute bacterial retentive filter is replaced. ISO standards require that all rinse water delivered to the washer/disinfector contain no more than 10 cfu (colony forming units) per 100 ml.

Microbiological quality of potable water varies considerably. If the quality of washer/disinfector supply water is unknown, perform water quality testing according to local or internal guidelines.

The **Water Line Disinfection** program or utility is used to disinfect both the water line and the water filter. Activating this utility fills the water line and water filter with disinfectant, and circulates it through the internal plumbing and the basin. The Water Line Disinfection cycle is complete following a minimum cycle duration of 2 hours.

1. Ensure that the disinfectant reservoirs are filled and the water supply is turned on.
2. Open the cover by pressing the **Open/Close** button.
3. Remove any endoscope(s).
4. Install a Disinfection Block on each basin connection manifold.

Figure 27 Disinfection Block

5. Press the **Menu** button for the left module on the control panel. The left side of the ADVANTAGE PLUS™ Reprocessor controls this utility.
6. Log in to the system.
7. When the **Program Selection** screen opens, click on **Program Selection** and click the **OK** button.

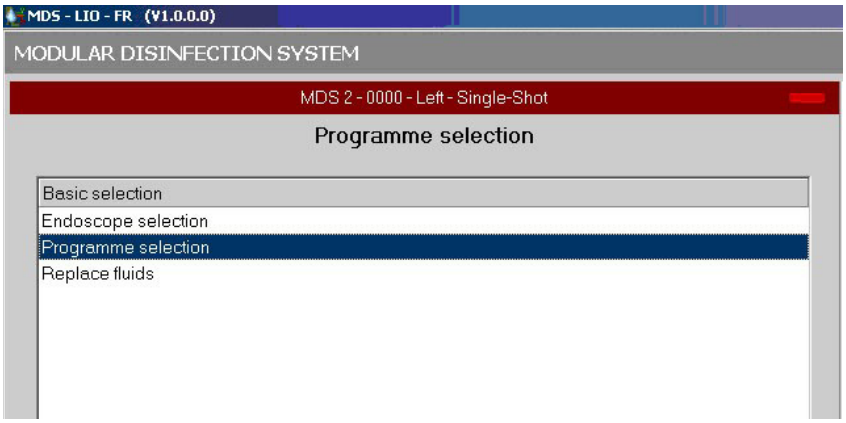


Figure 28 Program Selection

8. Select **Water Line Disinfect** from the **Select Program** screen and click the **OK** button.

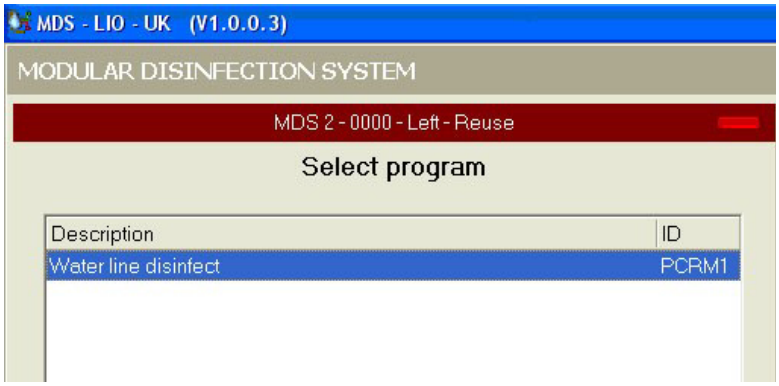


Figure 29 Water Line Disinfect

9. When the **Program Set Selection** screen opens, choose the appropriate **Self-Disinfection Cycle** and then click on the **OK** button:

   S Disinfect 2 hours

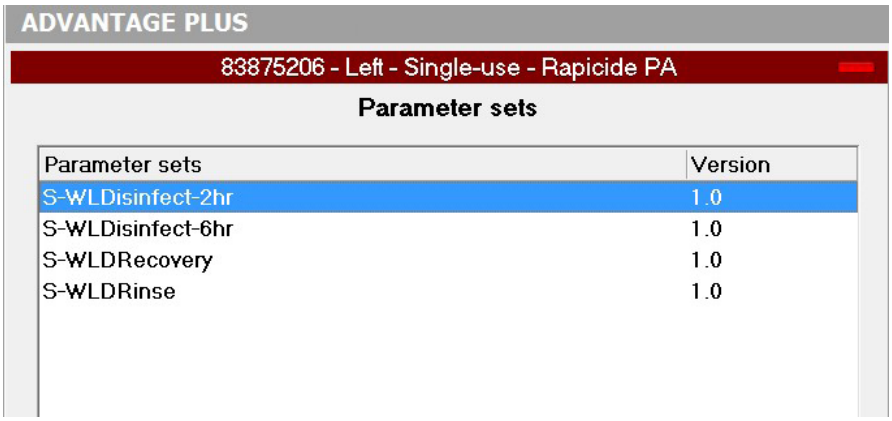


Figure 30 Program Set Selection

10. Select either **Normal Start** or **Delayed Start** and click on the **OK** button.

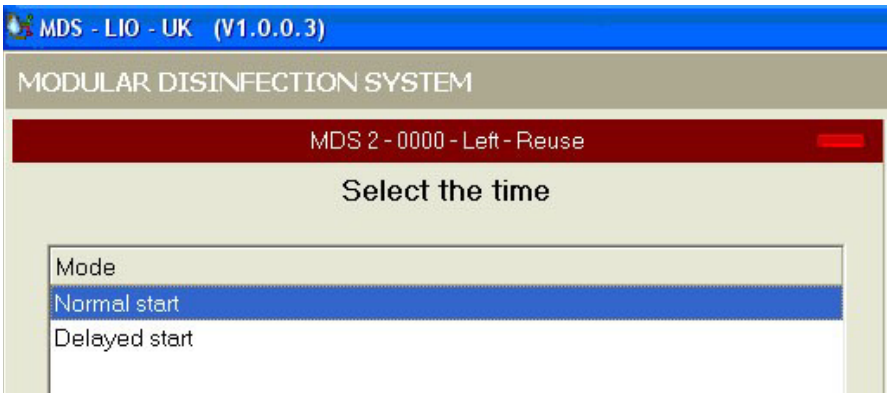


Figure 31 Normal Start

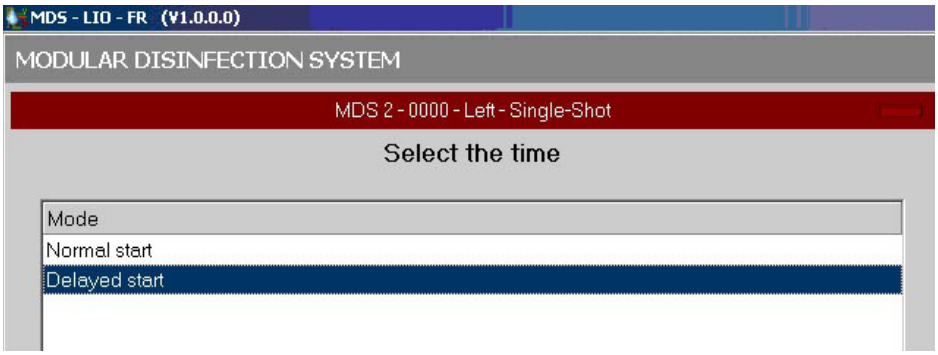


Figure 32 Delayed Start

11. If a **Delayed Start** is selected, a screen opens called **Select the Time**. It lists start times in 15 minute increments for the next 7 days. Note that the dates are listed in MM/DD/YYYY, where M = month, D = day, and Y = year. Scroll down to select the desired start time and click the **OK** ✓ button.

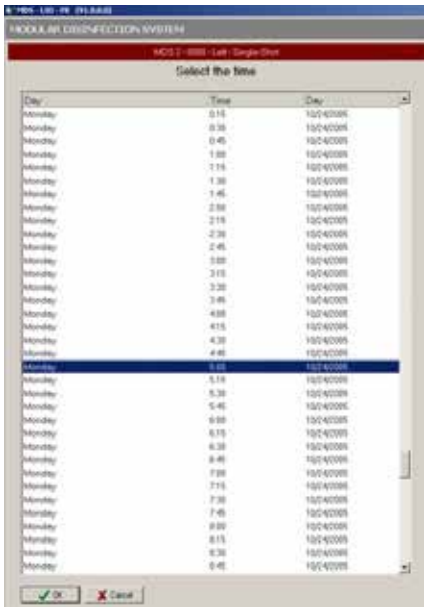


Figure 33 Select Delayed Start Time

12. An informational screen is displayed to verify that the disinfection blocks are installed. Select the **OK** ✓ button if the blocks are in place or select the **Cancel** ✗ button to install the water line disinfect blocks.

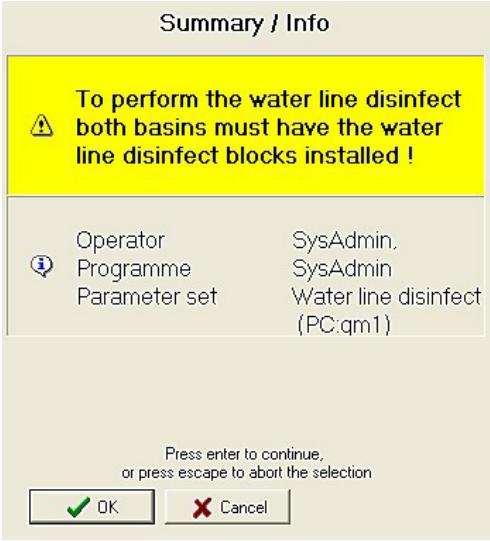


Figure 34 Summary/Information Screen

13. Press the **Start** button to initiate the water line disinfection. Disinfectant is flushed through the water line and water filled. The disinfectant remains in the water filter and water lines while the system is disinfected. The water lines and filter are flushed, the basin is rinsed and the utility terminates.

CHAPTER 3

OPERATION

This chapter explains how to prepare and disinfect an endoscope in the ADVANTAGE PLUS™ Reprocessor.

SYSTEM STARTUP

1. Verify that the ADVANTAGE PLUS™ Reprocessor PC and main power source are on.
2. Open the shutoff valve to the incoming water line. For optimum performance the water supply must be capable of delivering a minimum of 1.32 gpm (5 L/min) at 35 psi (2 bar).
3. Turn the external air source on (if applicable). External air supply must be capable of delivering house compressed air (dry / oil free) at a minimum rate of 10.58 G/min (40 L/min) at 87 psi (6 bar).

DAILY SERVICE

System Air Pressures

The main air pressure and leak test air pressure are maintained by regulators. The air pressure adjustment controls and corresponding gauges are located behind the front access door, just above the disinfectant reservoirs.

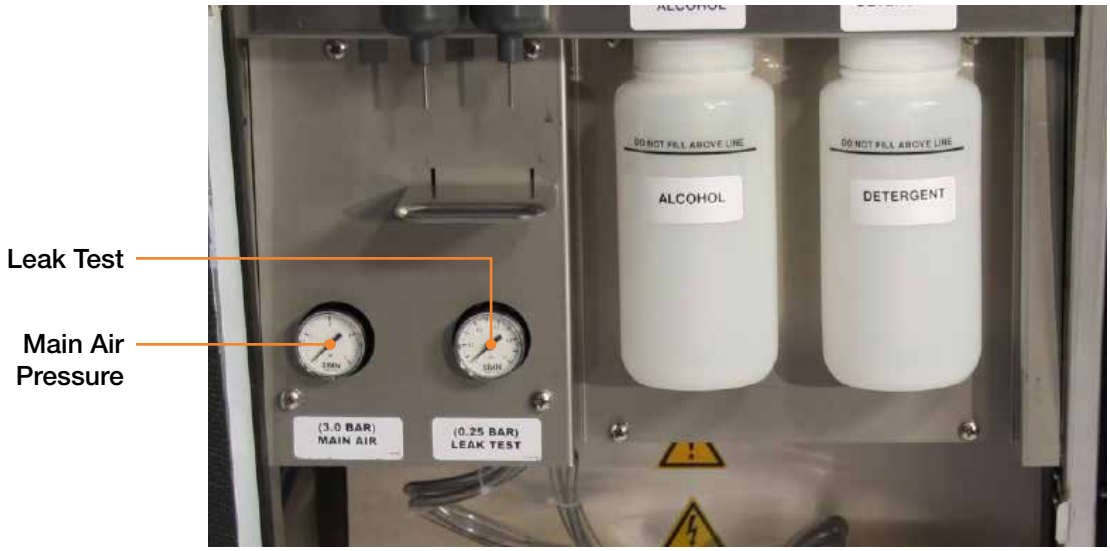


Figure 1 Air Pressure Controls

Proper operation of the ADVANTAGE PLUS Reprocessor requires that the air pressure be set and maintained at the values shown in the table below.

Table 1 Acceptable Pressure Ranges

Pressure Contol	Acceptable Pressure Range
Main Air Pressure	42 – 45 psi (2.8–3.0 bar)
Leak Test Air Pressure	3.6 – 3.75 psi (0.24–0.25 bar)
Channel Connectivity	25.5 – 30 psi (1.7 – 2.0 bar)

If the pressure control readings do not fall within the acceptable ranges, contact technical service. Do not attempt to adjust the settings yourself as damage may occur to the ADVANTAGE PLUS Reprocessor.

O-Rings

Check the connection manifolds to verify that all the O-rings are present and undamaged. The manifolds are located in each basin and are the studs onto which the connector block slides down and seals.

Figure 2 Connection Manifold

Drain Filters

Replace the filters in the rinse basin if they are excessively soiled (See *Appendix B* for replacement part numbers).

Figure 3 Drain Filters

Fluids

WARNING: REFILLING A RESERVOIR WITH THE INCORRECT FLUID MAY CAUSE THE ENDOSCOPE TO BE IMPROPERLY DISINFECTED. DO NOT USE THE ENDOSCOPE ON A PATIENT IF THIS OCCURS.

ALWAYS WEAR APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT (PPE) WHEN HANDLING ENDOSCOPES OR DISINFECTANT SOLUTIONS. THE DETERGENT AND DISINFECTANT MANUFACTURERS MAY RECOMMEND ADDITIONAL PROTECTION.

Loading Alcohol (Optional)

Alcohol is an optional feature and may not be configured in the system. If configured, the alcohol must be 70% isopropyl.

1. Press the **Menu** button on the control panel.
2. Log in to the system.
3. When the **Program Selection** screen opens, select **Replace Fluids** and click the **OK** button.

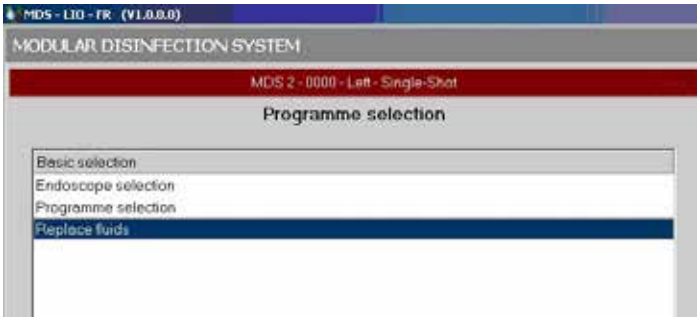


Figure 4 Program Selection Screen

4. When the **Select Fluid Type** screen opens, select **Alcohol** and click the **OK** button.

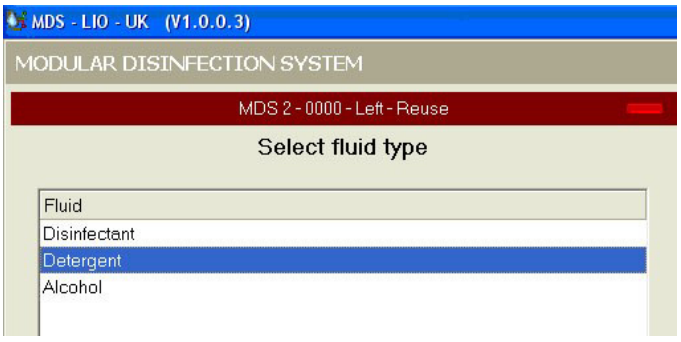


Figure 5 Select Fluid Type Screen

5. Enter the code found on the manufacturer's container and press **OK** button.

Figure 6 Container Code

6. Remove, refill and replace the reservoir.

Loading Detergent (Optional)

Detergent is an optional feature and may not be configured in the system.

Note: The ADVANTAGE PLUS™ Reprocessor cleaning phase requires the use of INTERCEPT™ Detergent (or PROTEAZONE™ PLUS Detergent for countries adopting German guideline*).

Remove, refill and replace the detergent reservoir.

1. Press the **Menu** button on the control panel. Log in to the system.
2. When the **Program Selection** screen opens, select **Replace Fluids** and click the **OK** button.

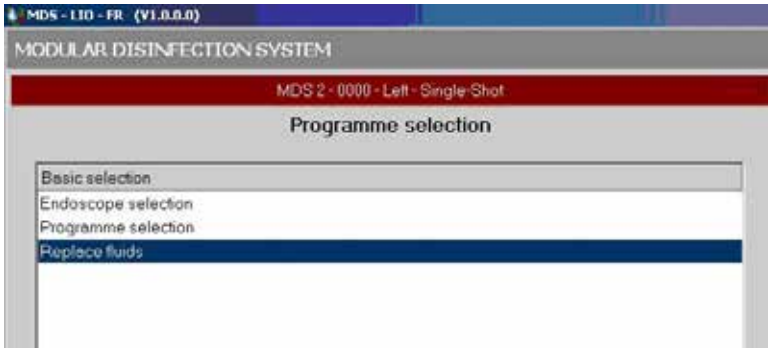


Figure 7 Program Selection Screen

3. When the **Select Fluid Type** screen opens, select **Detergent** and click the **OK** button.

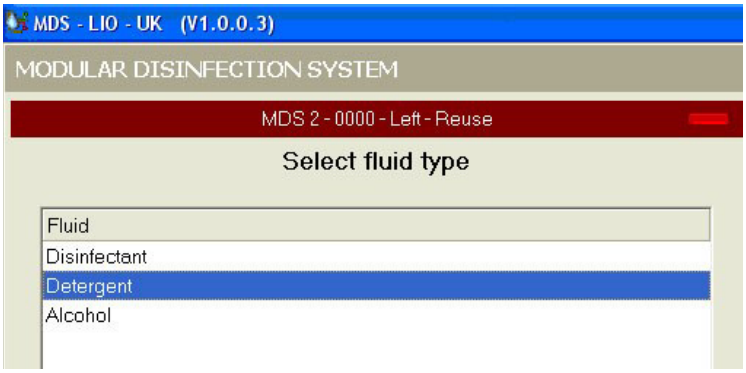


Figure 8 Select Fluid Type Screen

4. Enter the code found on the manufacturer's container and press the **OK** button.

Figure 9 Container Code

5. Remove, refill and replace the reservoir.

Loading Disinfectant

WARNING: USE ONLY RAPICIDE™ PA HIGH-LEVEL DISINFECTANT.

CHECK THE EXPIRATION DATE OF THE DISINFECTANT ON THE MACHINE EACH DAY.

NEVER USE DISINFECTANT BEYOND THE MANUFACTURER'S EXPIRATION DATE, EVEN IF THE MRC LEVEL IS ACCEPTABLE.

NEVER USE DISINFECTANT THAT TESTS BELOW THE ACCEPTABLE MRC LEVEL, EVEN IF IT HAS NOT YET REACHED THE EXPIRATION DATE.

WHEN REPLACING DISINFECTANT, ALWAYS WEAR PROTECTIVE CLOTHING, GLOVES AND EYE WEAR. THE DISINFECTANT MANUFACTURER MAY RECOMMEND ADDITIONAL PROTECTION.

IF LEAKING LIQUID IS PRESENT AND YOU SUSPECT IT IS DISINFECTANT, READ AND FOLLOW THE MANUFACTURER'S INSTRUCTIONS BEFORE ATTEMPTING A CLEANUP.

Service: If leaking fluids are present, contact a qualified service technician.

1. Press the **Menu** button on the control panel.
2. Log in to the system.
3. When the **Program Selection** screen opens, select **Replace Fluids** and click the **OK** button.

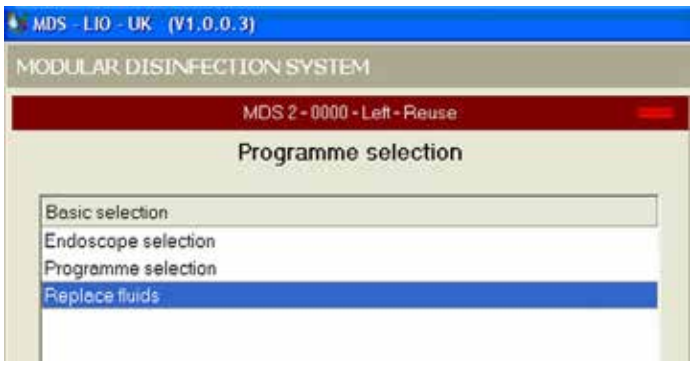


Figure 10 Program Selection Screen

4. When the **Select Fluid Type** screen opens, select **Disinfectant** and click **OK**.
5. Enter the code found on the manufacturer's container and press **OK**.
6. Remove, and discard the empty containers of Part A and Part B solutions.
7. Place the new containers of Part A and Part B solutions into the machine.

INSTALL THE CONNECTOR BLOCK

1. Hold the connector block with the handle positioned to the right in *Figure 11*.

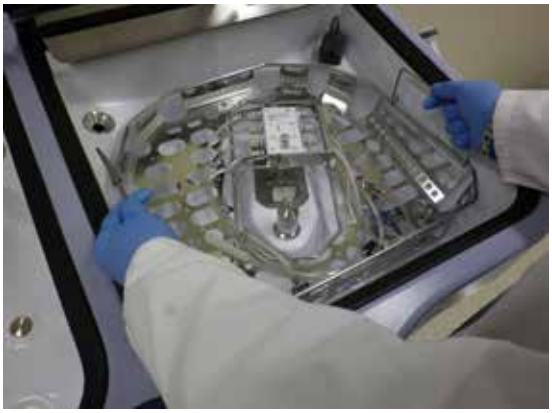


Figure 11 Fitting the Connector Block

2. Place the block lightly over the manifold as shown in *Figure 12* making sure that none of the hoses run or are pinched under the block.

Figure 12 Press Block Over the Manifold

3. Lock the connector block in place by moving the handle to the left as shown in *Figure 13*.

Figure 13 Close the Handle

WARNING: INSPECT THE SEATING OF THE CONNECTOR BLOCK TO THE MANIFOLD. FAILURE TO ACHIEVE A PROPER CONNECTION COULD RESULT IN AN ENDOSCOPE THAT IS NOT DISINFECTED AND THEREFORE SHOULD NOT BE USED ON A PATIENT.

PREPARE THE ENDOSCOPE

CAUTION: When using the cleaning cycle, endoscopes must be precleaned according to SGNA and facility guidelines. Manual cleaning of the endoscopes is not required. It is recommended that reprocessing using the cleaning cycle be performed within one hour after the procedure. If the cleaning cycle is not chosen, endoscopes must be manually cleaned before placing in the reprocessor for disinfection.

Place the Endoscope in the Basin

1. Endoscopes fit best in the machine if they are installed in a particular fashion. The final position of the endoscope in the rinse basin depends primarily on the type of endoscope. To a lesser extent, the brand of endoscope may also affect the final position in the basin. Do not forcibly bend the endoscope to get it to fit. When positioned properly, the endoscope will fit appropriately in the basin.
2. Hold the control housing in your left hand and the insertion tube and light guide in your right hand.
3. Place the control housing in the basin with the angulation controls facing up.

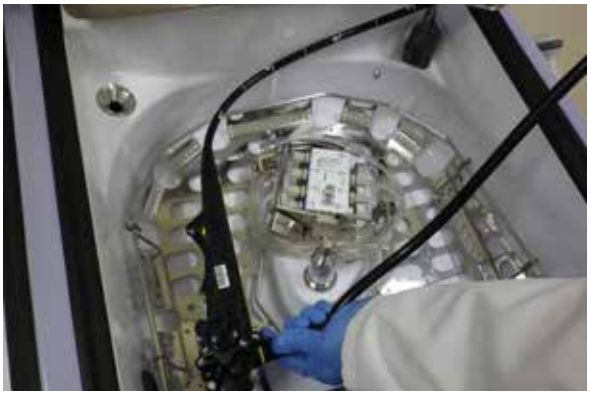


Figure 14 Place Control Housing in Basin

4. Set the insertion tube in a clockwise circle in the basin.

Figure 15 Set the Insertion Tube in Basin

5. Fit the light guide tube in a counterclockwise circle in the basin.
6. Select the proper connection block and channel separator from the endoscope hookup guide.

Figure 16 Fit the Light Guide Tube in Basin

Install the Channel Separator

Note: Reference the endoscope hookup application guide for the correct channel separator.

Select the correct channel separator for the endoscope to be disinfected. Position the adapter so that the stem with the O-ring fits properly in the water/air valve.

Because the valve design may vary depending on the brand and type of endoscope, attachment of the adapters may differ.

Figure 17 Fitting the Separator

Connect the Endoscope Channels

1. Connect the endoscope channels. The names of the connections of the different channels may be found in the endoscope user manual. See *Figure 18* for details on how to hookup the endoscope to the connectors.
2. Connect each tube from the labeled port on the connector block to the appropriate endoscope channel.

WARNING: ALL ENDOSCOPE HOOKUPS MUST BE PERIODICALLY INSPECTED FOR DAMAGE, AND REPLACED IF DAMAGED, OTHERWISE IT COULD RESULT IN AN ENDOSCOPE THAT IS NOT DISINFECTED AND THEREFORE SHOULD NOT BE USED ON A PATIENT.

Figure 18 Connecting the Channels

3. Make sure the hoses do not have any sharp bends or kinks.
4. Position the connection hoses in such a way that they will not be caught by the spray tower.

Verify the Connections

WARNING: VERIFY ALL CONNECTION TO THE ENDOSCOPE ARE SECURE. FAILURE TO DO SO COULD RESULT IN AN ENDOSCOPE WHICH IS NOT DISINFECTED AND THEREFORE SHOULD NOT BE USED ON A PATIENT.

- Before closing the basin lid, inspect the hookup to ensure that all connections are made properly and the tubing does not interfere with the sprayer.
- All channels must be connected correctly.
- The channel separator must be installed.
- The leak test tubing must be secured under the endoscope so that it does not float or interfere with the sprayer.
- The connector hoses must not be kinked.
- Move any connector tubes away from the head of the sprayer so that it can turn freely.

WARNING: VERIFY THE CONNECTION TUBING DOES NOT INTERFERE WITH THE SPRAY HEAD AND CONFIRM THAT THE SPRAY FUNCTION IS WORKING DURING THE CYCLE. FAILURE TO DO THIS COULD RESULT IN AN ENDOSCOPE THAT IS NOT DISINFECTED AND THEREFORE SHOULD NOT BE USED ON A PATIENT.

Figure 19 Sprayer Must Turn Freely

DISINFECTION PROCESS SUMMARY

The complete reprocessing cycle in the ADVANTAGE PLUS™ Reprocessor is comprised of a number of specific steps designed to ensure proper endoscope disinfection. These steps include: startup, washing, disinfectant, rinse, alcohol, and air phases. All steps must be properly followed and should not be modified beyond manufacturer recommendations.

Cycle Startup Phase

During the start-up phase, the software reads and monitors all system sensors. If an error is detected, a message is displayed and the process is halted. The system operator then needs to resolve the error before the cycle can be continued.

Next the leak test is activated. The endoscope is pressurized and the pressure is monitored for a period of time. If the pressure drops below a set reading, an error message is displayed and the process is halted.

WARNING: IF THE MACHINE DETECTS A LEAK IN THE ENDOSCOPE, DO NOT USE THE ENDOSCOPE ON PATIENTS.

Refer to *Chapter 5: Troubleshooting* for appropriate instructions to resolve errors.

Cleaning Phase (Optional)

During the cleaning phase, detergent and water enter the basin. This basin fluid is then flushed through the endoscope channels. At the completion of the phase, the basin is drained and the endoscope channels are flushed with fresh water. A rinse soak period without detergent then follows.

Disinfectant Phase

During the disinfectant phase, the endoscope channels are flushed with disinfectant. The basin is filled with disinfectant solutions and the endoscope is soaked for the disinfectant contact time as recommended by the disinfectant manufacturer. After the soak, the disinfectant is drained from the basin.

Rinse Phase

During the rinse phase, the basin is partially filled with water and then drained to eliminate foam residue from inside the endoscope and from the basin. The basin is then filled with fresh water while the endoscope channels are being flushed. Once the basin fills up, water flushes through the endoscope channels. The basin is then drained while the channels are purged with fresh water.

Alcohol Purge Phase (Optional)

During the alcohol phase, alcohol is injected through the endoscope channels. The alcohol is used to help purge any residual fluids from the endoscope.

Air Purge Phase

The air phase is simply a programmed time during which air is purged through the endoscope channels. The air is used to aid in drying of the endoscope.

RUN THE DISINFECTION PROGRAM

Normal Start

Data entry must be carried out carefully. Each selection or input must be checked and confirmed by the operator. Entering erroneous information may lead to machine faults or inadequate disinfection of an endoscope channel.

1. Close the basin lid by pressing the **Open/Close** button or the foot switch.
2. Press the **Menu** button.
3. When the **Operator Selection** window opens, select your login name by using the **Scroll Down** button, or use the touchpad, barcode reader. Then click the **OK** button.
4. If the **Authorization** window opens. Enter your password with the touchpad, barcode reader and then click the **OK** button (option).
5. When the **Program Selection** window opens, highlight **Endoscope Selection** and click the **OK** button.

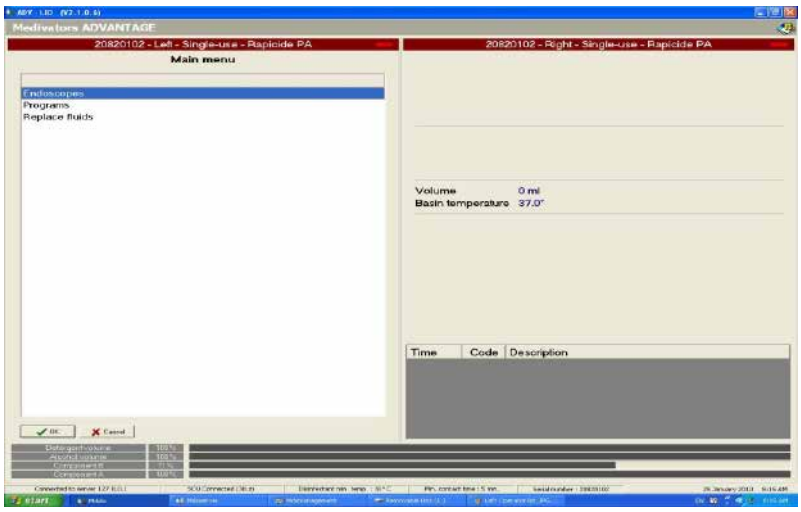


Figure 20 Program Selection

6. The **Hookup** menu will appear, scan the hookup barcode or select the hookup from the menu.
7. The **Endoscope** menu will appear, scan the endoscope barcode, or selects the endoscope from the menu.

Note: The endoscope code or ID is required for the disinfection program to run. If pre-programmed endoscope codes have been entered by your system administrator, the specific disinfection program for that endoscope is selected automatically.

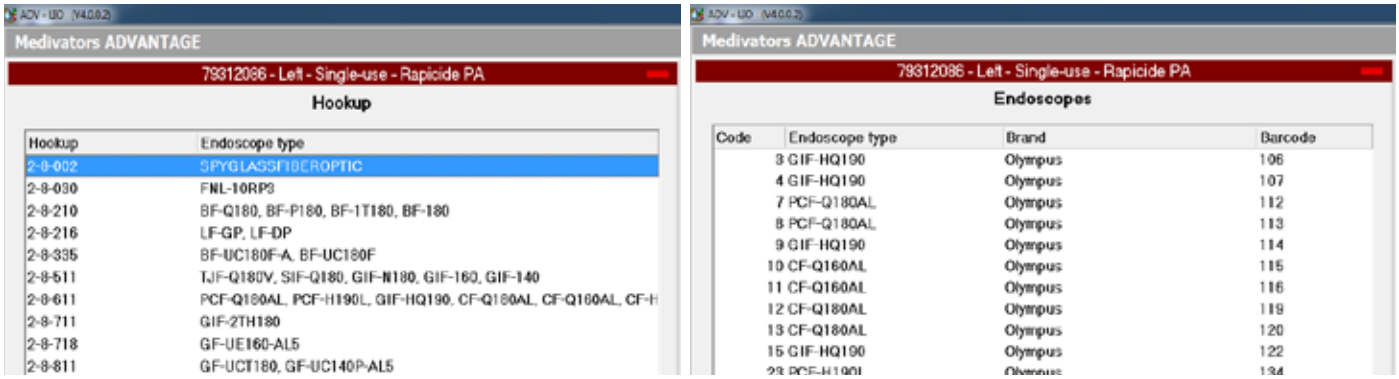


Figure 21 Hookup and Endoscope Selection

8. If prompted, elect the correct parameter set from the **Endoscope Type Parameter Set Selection** window by scrolling up or down with the **Scroll Down** button or **Scroll Up** button. Then click the **OK** button.

Figure 22 Parameter Set

WARNING: ENSURE THE CORRECT PARAMETER SET IS SELECTED FOR THE TYPE OF ENDOSCOPE TO BE PROCESSED. AN ENDOSCOPE IS NOT DISINFECTED AND SHOULD NOT BE USED ON A PATIENT IF THE INCORRECT PARAMETER SET IS USED DURING A CYCLE.

9. The **Patient Code** window opens. Enter the patient ID with the touchpad or barcode reader and click the **OK** button.

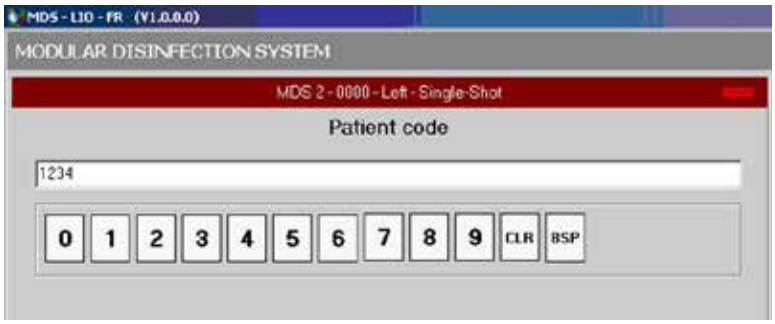


Figure 23 Patient Code

10. When the **Physician Selection** window opens, select the desired name by scrolling with the **Scroll Down** button, or use the barcode reader. Then click the **OK** button.
11. When the **Physician Assistant Selection** window opens, select the desired name by scrolling with the **Scroll Down** button, or use the barcode reader. Then click the **OK** button.

Note: The patient code, physician code, and assistant code on your ADVANTAGE PLUS™ Reprocessor are configurable. If your system administrator has determined that these items do not have to be tracked, the screens will not be shown.

12. If the system is configured to automatically start the operator needs to do nothing more and the cycle will start. If not configured the **Start Program** window opens. Verify that the Start data on the screen is correct, and then click the **OK** button. The process LED indicator light should turn green.
13. A system check is carried out. If a red error report appears at the bottom of the screen, attempt to correct the error by consulting *Chapter 5: Troubleshooting*.
14. The **Program Screen** opens and allows you to follow the progress of the disinfection process.

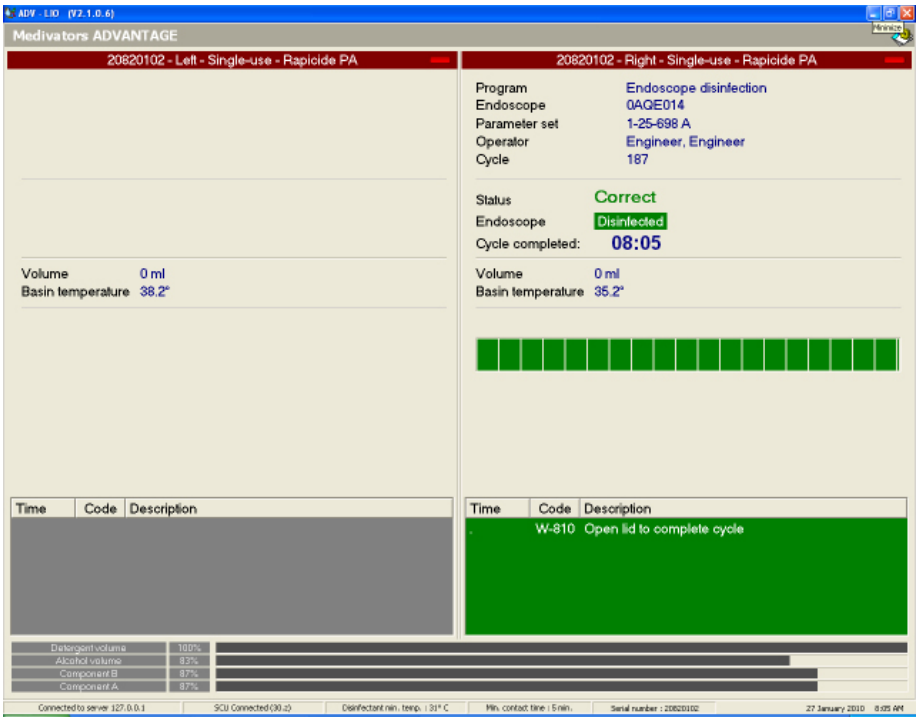


Figure 24 Process Window

Delayed Start

When selecting an **Delayed Start**, the endoscope is placed in the basin but the disinfection cycle will not begin until a pre-determined time. This is an administrative function and is available only during the time period as set up and allowed by the system administrator.

1. Prepare and connect the endoscope as described in *Run the Disinfection Program*, steps 1-12 for the **Normal Start** above.
2. The **Select the Time** window opens. Select **Delayed Start** and press the **OK** button. If the **Select the Time** window does not open, the **Delayed Start** features is not available.

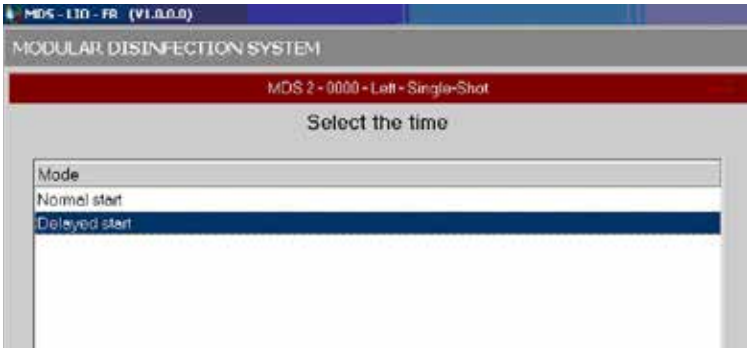


Figure 25 Delayed Start

3. When the **Select the Time** window opens, scroll down to select the desired start time and date. Click the **OK** button.

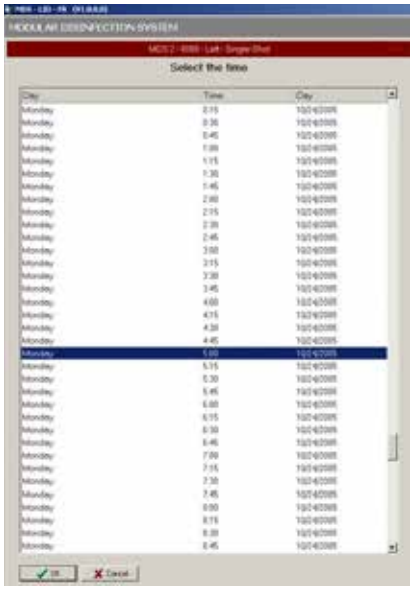


Figure 26 Select the Time

4. The **Delay Start** program window opens. Verify that the data on the screen is correct, and then click the **Start** button.

Figure 27 Delayed Start Progress

5. When the designated start time is reached, a system check is carried out. If a yellow error report appears at the bottom of the screen, attempt to correct the error by consulting *Chapter 5: Troubleshooting*.
6. The reprocessing cycles is initiated at the selected start time.

CYCLE INTERRUPTIONS

Introduction

At startup and during the disinfection program cycle, the ADVANTAGE PLUS™ Reprocessor monitors process parameters for the endoscope, machine, and software to ensure accurate disinfection of the endoscope. Reports, program errors, and system errors appear on the screen to communicate the cycle progress to you.

Operator messages and program errors appear at the bottom of the screen in the Reports field. A code number and short description of the report or error is shown. The elapsed time at which the message or error is generated is also provided.

System errors appear at the top of the screen in white letters on a red background.

Detailed error reports and troubleshooting steps are provided in *Chapter 5*.

WARNING: IF SYSTEM POWER IS LOST DURING A REPROCESSING CYCLE, THE SYSTEM WILL NOT COMPLETE THE REPROCESSING CYCLE ONCE THE POWER IS RESTORED. THE ENDOSCOPE IS NOT DISINFECTED AND SHOULD NOT BE USED ON A PATIENT. YOU MUST START THE REPROCESSING CYCLE OVER SO THAT THE ENDOSCOPE IS PROPERLY DISINFECTED.

Program Errors

Restarting a Program

In a certain instances, a program may be restarted after an error is displayed to restart the program if the following conditions are true:

To restart the program:

1. Press the **Start** button.
2. If the program restarts and progresses without any further errors, the disinfection cycle is valid.
3. If the program does not restart, or one or more errors appear, press the **Cancel** button. Follow the instructions below for the steps to take next.

If a program is stopped by an error condition and lasts longer than 60 minutes, the program can not be restarted, the LED turns red, and the program status is ASC (Reject).

Canceling a Program

If the **Cancel** button is pressed, the program runs until a safe state is reached.

The alarm sounds and cancel message appears in the Report section of the screen.

Every time the **Cancel** button is pressed, the current program step is stopped and the next step in the cancel sequence is called. By pressing the **Cancel** button multiple times, the program can be forced to the end of the cycle. However, caution must be taken because the endoscope channels remain filled with fluid.

One of two status messages appears on the monitor. Follow the instructions below for the status message on your monitor.

Status: Failure Recovery

1. Press the **Cancel** button.
2. Press the **Open/Close** button.
3. Select your login name and press the **OK** button.
4. Enter your login name and password.
5. The basin lid opens.
6. Remove the endoscope or correct the cause of the error.
7. Re-start the disinfection program.

Status: Shutdown

The endoscope cannot be removed from the machine. Continue the disinfection program.

After the current program is completed, run the disinfection program again. Except for the operator login name, all entered data are automatically copied from the previous run if these steps are followed:

1. Press the **Open/Close** button.
2. Select your login name and press the **OK** button.
3. Enter your login name and password.
4. The basin cover opens.
5. Within 30 seconds, press the **Menu** button.
6. Select your login name and press the **OK** button.
7. Enter your login name and password.
8. Select "**Repeat Last Run**" and press the **OK** button.

System Errors

If a system error occurs during standby mode, a warning message appears as the fault occurs but disappears as the situation is corrected.

If the error occurs during a disinfection cycle, the program ends and fluids are drained from the basin. A **Recovery** program runs until a safe state is reached and the endoscope can be removed. The **Recovery** program cannot be stopped by the operator.

WARNING: REPORT ALL SYSTEM ERRORS TO YOUR SUPERVISOR.

TAKING A SAMPLE OF DISINFECTANT - CHECK MRC

At the end of a cycle, the system will prompt to collect disinfectant.

1. Open the center door to access the sample port.
2. Wearing protective gloves, take a sample of the disinfectant from the sample port by pressing a sample cup up against the metal prong.

Figure 28 Taking a Disinfectant Sample

3. Close the access door.
4. Test the sample using RAPICIDE™ PA Test Strips to ensure that the disinfectant is above MRC.
5. Follow the prompt on the screen indicating whether the MRC passed or failed.

If Test Strip Fails

1. If the test strips indicates a fail, rerun the cycle and retest:
2. If the test strip indicates a fail again, open a new bottle of test strips and test the concentration again with a new test strip.
3. If it continues to fail, contact Medivators Technical Support or your Medivators Distributor.

COMPLETE THE DISINFECTION PROCESS

When the disinfection process is complete, the process LED indicator light blinks green, the message “Completed” displays on the LCD screen, and the alarm sounds.

Table 2 Post-Disinfection Program Status

Pressure Contol	Acceptable Pressure Range
ACTIVE	The program is progressing correctly.
CORRECT	The endoscope was disinfected without any faults or program interruptions.
CORRECT!!!	The endoscope was disinfected with errors reported.
STOP (fault)	The program is stopped due to an error.
STOP (ASC)	The **Safety Control** program stopped the program.
STOP (OPERATOR)	The operator stopped the program without a fault report.
STOP (LIO)	The program stopped automatically after an error report or the maximum error time (50 minutes) was reached.
SHUTDOWN (fault)	After an error, the endoscope is rinsed so that it can be safely removed.
SHUTDOWN (OPERATOR)	The operator stopped the program. Run down program.
SHUTDOWN (ASC)	The **Safety Control** program stopped the disinfection. Completion program.
ASC (REJECT)	The **Safety Control** program rejected the disinfection. Open the lid to close the program.
LIO (REJECT)	Disinfection was rejected due to an automatic program stop.

Table 3 Post-Disinfection Instrument Status

Status	Description
DISINFECTED	The endoscope was run through a complete disinfection program.
NOT APPLICABLE	The program is not an endoscope disinfection program. **WARNING: THE ENDOSCOPE CAN BE USED ONLY IF THE CONNECTORS ARE CORRECTLY CONNECTED AFTER THE PROGRAM.**
NOT SUITABLE FOR USE	The endoscope is insufficiently disinfected.

WARNING: WEAR CLEAN GLOVES TO PREVENT SOILING OF THE DISINFECTED ENDOSCOPE.

IF A RUN ERROR WAS GENERATED, A CHANNEL IS BLOCKED, OR THE ENDOSCOPE IS LEAKING, THE ENDOSCOPE MUST NOT BE RELEASED FOR PATIENT USE. IF THERE IS ANY DOUBT AS TO WHETHER AN ENDOSCOPE IS CORRECTLY DISINFECTED, IT MUST BE DISINFECTED AGAIN BEFORE USE. CONTACT YOUR SUPERVISOR FOR FURTHER INSTRUCTIONS.

VERIFY ALL CONNECTIONS TO THE ENDOSCOPE ARE SECURE. FAILURE TO DO SO COULD RESULT IN AN ENDOSCOPE WHICH IS NOT DISINFECTED AND THEREFORE SHOULD NOT BE USED ON A PATIENT.

1. Open the basin lid by pressing the **Open/Close** button or by using the foot switch. The run status report disappears and the **Operator Selection** window opens.
2. Enter your login name and password.
3. Check that all adapters are still connected to the channel connections. If an adapter is loose or disconnected, the disinfection was not complete and must be repeated.

WARNING: BEFORE REMOVING THE ENDOSCOPE, VERIFY ALL CONNECTIONS TO THE ENDOSCOPE ARE SECURE. IF AN ADAPTER IS LOOSE OR DISCONNECTED, THE DISINFECTION WAS NOT COMPLETE AND MUST BE REPEATED. FAILURE TO DO SO COULD RESULT IN AN ENDOSCOPE WHICH IS NOT DISINFECTED AND THEREFORE SHOULD NOT BE USED ON A PATIENT.

4. Disconnect the channel adapters
5. Remove the channel separator(s).
6. Take the connector block out of the basin and hang up the block to dry.
7. Take the endoscope out of the basin.
8. If appropriate, fit the valves.
9. The endoscope is now ready for a new examination. If it will not be used right away, the endoscope must be stored in an airing cupboard or on a suspension rack.
10. If automatic cycle log printing is enabled, the log is printed.

REPORTS

Run Data Recorded

For each disinfection program run, the following data is recorded and stored on the PC hard drive:

- Machine ID
- Run number
- Date and time
- Endoscope Code
- Operator ID
- Patient ID
- Process step times
- Errors
- Disinfectant MRC Pass/Fail
- Additional information as set up by the system administrator

Printing Reports

Current Report

A cycle log prints automatically whenever the ADVANTAGE PLUS™ Reprocessor module cover opens at the end of a disinfection cycle. To redisplay the current cycle log, double-click the **Printer** icon in the system tray.

Earlier Reports

All completed cycle logs may be viewed and reprinted at any time from the **Management** program.

1. Display the Windows desktop by minimizing all running programs.
2. Double-click on the ADVANTAGE PLUS Reprocessor **ADV** icon to open the folder.

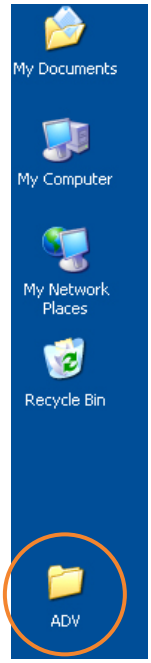


Figure 29 ADVANTAGE PLUS™ Reprocessor Desktop Folder

3. Double-click on the **Management** icon.

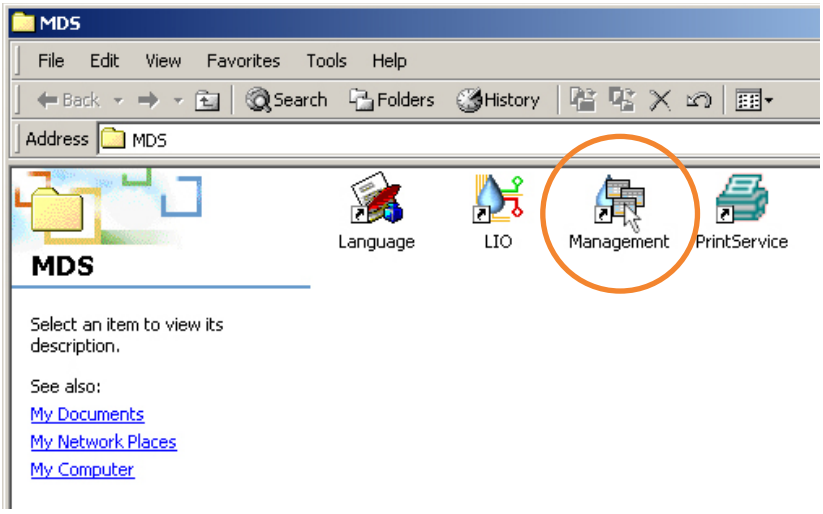


Figure 30 Management Icon

4. Log in to the **Management** system.
5. On the **Management** screen sidebar, click on the **General** tab.

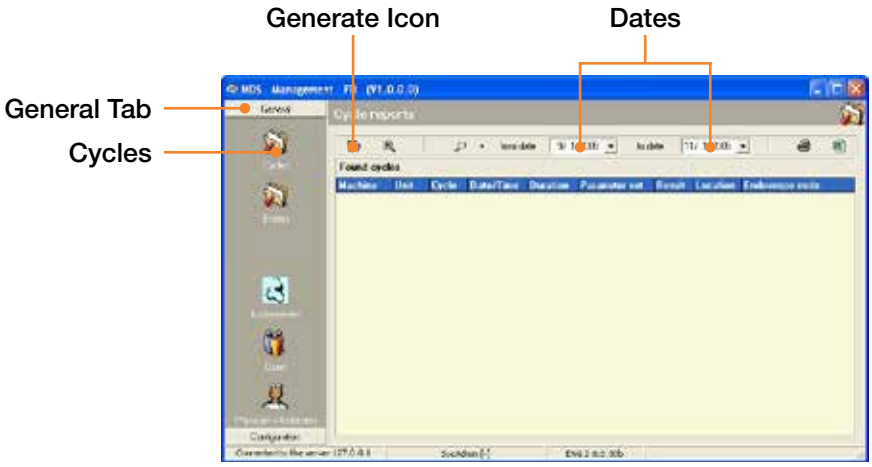


Figure 31 Management Screen

6. On the sidebar, click on the **Cycles** icon.
7. On the blank **Cycle Reports** screen, set the **From Date** and **To Date** parameters, and then click on the **Generate** icon in the toolbar.
8. The **Cycle Reports** screen opens. Double-click on the desired cycle. Click on the  icon to display the **Cycle Log** screen. Click on  to display the detailed **Cycle Report**.

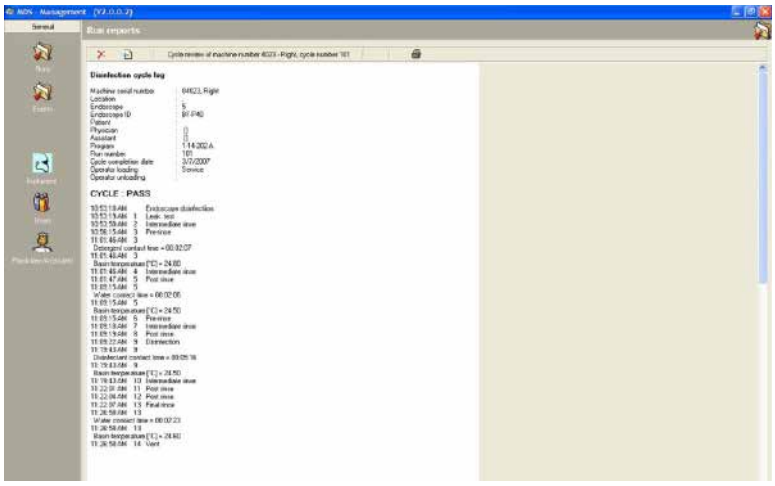


Figure 32 Cycle Log Screen

Cycle reports

from date 9/ 1/2005 to date 11/ 1/2005

Found cycles

Machine	Unit	Cycle	Date/Time	Duration	Parameter set	Result	Location	Endoscope code
0	Left	7	11/1/2005 2:49:36 PM	12:01:49 AM	SS-402	Stop (Failure)	.	
0	Left	6	10/10/2005 2:45:02 PM	12:00:04 AM	SS-402	Stop (Operator)	.	
0	Left	5	10/10/2005 2:32:44 PM	12:00:03 AM	SS-402	Stop (Operator)	.	
0	Left	4	10/10/2005 2:31:52 PM	12:00:06 AM	SS-402	Stop (Operator)	.	
0	Left	3	10/10/2005 2:29:21 PM	12:00:33 AM	S-Sanitize	Stop (Operator)	.	
0	Left	2	10/10/2005 2:22:26 PM	12:00:34 AM	S-Sanitize	Stop (Failure)	.	
0	Left	1	10/6/2005 1:27:56 PM	12:01:18 AM	SS-402	Stop (Failure)	.	

Figure 33 Cycle Reports Screen

9. The **Cycle Details** screen appears. Click on the **Plus Sign** to the left of each line to expand the report. Click on the **Printer** icon to print a copy of the report.

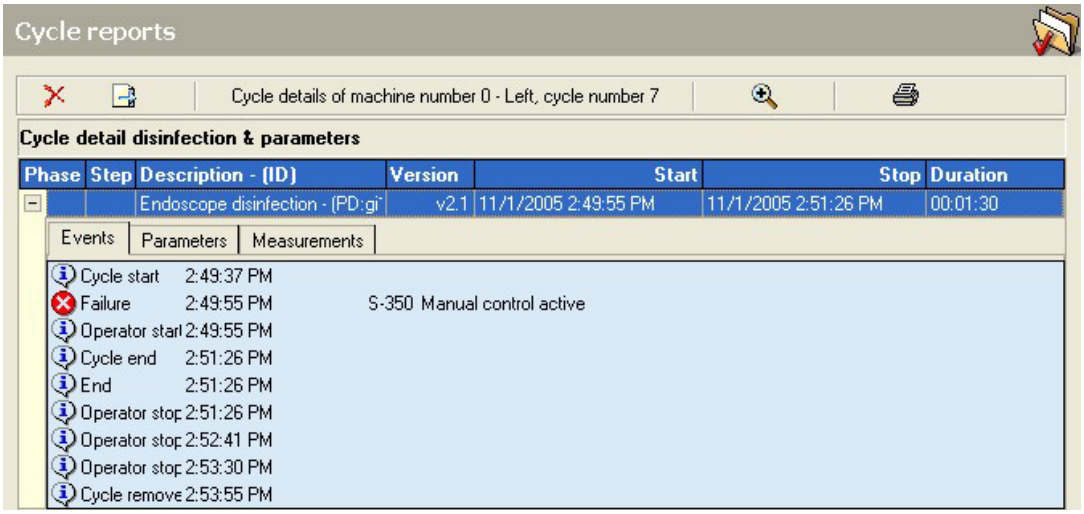


Figure 34 Cycle Details Screen

SHUTDOWN

Use the following process to shutdown the reprocessor at the end of the day.

1. Wipe the basins dry with a lint free cloth.

WARNING: AVOID POSSIBLE CHEMICAL BURNS. ALWAYS WEAR PERSONAL PROTECTIVE EQUIPMENT (GLOVES, GOGGLES) WHEN HANDLING DISINFECTANT AND/OR DETERGENT.

2. Check the detergent and alcohol reservoirs for appropriate levels. Refill them if necessary.
3. Clean the detergent cap, bracket and reservoir. Flush the reservoir thoroughly with hot water. Refill the detergent reservoir, if necessary.
4. Close the incoming water line shutoff valve (unless either a **Delayed Start** program, water-line disinfect or endoscope reprocessing cycle is to be run).

PROCEDURE SUMMARY

1. Open the cover.
2. Connect the endoscope.
3. Close the cover.
4. Enter your login name and password, the endoscope ID, the patient number, the physician ID, and the assistant ID.
5. Start the program.
6. After disinfection, open the basin lid.
7. Enter your login name and password.
8. Check the sprayer and the connections.
9. Disconnect the connector block.
10. Remove the endoscope from the basin.
11. Print a report.

DOWNTIME

Brief Downtime

- If the ADVANTAGE PLUS™ Reprocessor will be unused for a brief period time—less than seven days—it should remain powered on.
- To prevent moisture in the leak test system, fit disinfection blocks in the ADVANTAGE PLUS Reprocessor when it is not is use.

Prolonged Downtime

- If the ADVANTAGE PLUS Reprocessor will be unused for more than seven days, it should be powered off.
- The tubing, blocks, and filters in the machine contain a lot of water where bacterial growth may occur. If the ADVANTAGE PLUS Reprocessor is down for 30 days or longer, replace the bacterial filter and disinfect the ADVANTAGE PLUS Reprocessor before running any endoscope disinfection procedures.
- To shut down the ADVANTAGE PLUS Reprocessor, close all running programs first before pressing the main PC power switch. Failure to do this may result in software errors.
- See storage section for further information.

CHAPTER 4

MAINTENANCE

This chapter contains basic service procedures required for maintaining the ADVANTAGE PLUS™ Reprocessor. Strict adherence to these requirements guarantees optimum continuous quality in endoscope reprocessing. Failure to perform required maintenance may result in injury or death to the operator or patient.

Note: The personnel responsible for these tasks varies by location. Verify your location's policies and procedures before performing any of the tasks in this chapter.

Note: When performing maintenance activities on the ADVANTAGE PLUS™ Reprocessor, ensure there is adequate ambient illumination to prevent against hazards during maintenance.

WEEKLY MAINTENANCE

Inspection

Inspect the following on a weekly basis. Adjustments or changes should be made by a qualified service technician.

- **Hookup Connector Blocks:** Check for cracks in the hookup hoses, especially at the connections to the connector block. If cracks have formed, the hose should be replaced.
- **Glass Covers:** The basin lids should open and close easily.
- **Door:** The front door should open and close easily.
- **ADVANTAGE PLUS™ Reprocessor Tubing, Connections, Fittings, Hydraulics and Dosing System:** Check for wear and leakage and replace as needed.

In order to ensure the required water quality standards are met the water line disinfection must be performed weekly.

O-Ring Lubrication

1. Using a cloth, dry the O-rings on the connection columns. Check for wear and replace as needed.
2. Take a small amount of O-ring grease between your thumb and index finger and spread it diagonally on the connector plate along the first two columns.
3. Repeat these two steps for the other three pairs of columns.
4. Spread the grease lengthwise along the O-rings with your thumb and index finger.

MONTHLY MAINTENANCE

Basin Drain Filter and Drain Screen

The basin drain filters and drain screen are located in the drains of each basin.

1. Using the supplied filter hook first remove the basin drain screen, the basin drain screen is the round metal disc with small holes that snaps into the basin drain.
2. Visually inspect the basin drain screen for debris, clean under running water in a sink.
3. Using the same filter hook remove the basin drain filter and discard.
4. Install the new basin drain filter.
5. Reinstall the basin drain screen.

Spray Arm Screen

To access the spray arm screen open the outer doors as well as the inner service doors. The spray arm filters are located under each basin to the left of the drain manifold.

1. Place a towel over the area below the spray arm drain screen.
2. Unscrew the cap counter clockwise, fluid will be present.
3. Remove the screen and clean, the screen is not replaced.
4. Place cleaned screen back in the housing.
5. Reattach the cap; ensure the red seal is in place in the cap.

SIX MONTH MAINTENANCE

Air Filter Replacement

The ADVANTAGE PLUS™ Reprocessor has four (4) air filters. Each filter should be replaced every 6 months.

1. Acquire new inline filter assemblies (See *Appendix B* for replacement part numbers).
2. Open the right and left blue-doors and locate the filters.

Figure 1 Filter Location

3. Remove one filter at a time. Move the filter away from the machine to allow access to the fittings.

Figure 2 Quick Connect Fitting

4. Press on **Quick Connect** fittings to release the filter.

Figure 3 Pressing Quick Connect Button

5. Remove and discard the filter assembly.
6. Replace the filter by attaching the Quick Connect fittings. Ensure that the color coded fittings match.
7. Close the doors.

WATER FILTER REPLACEMENT

WARNING: ONLY REPLACE ONE WATER FILTER AT A TIME. WHEN REPLACING THE WATER FILTER, MAKE SURE THAT THE FILTER BEING REMOVED IS THE SAME AS THE FILTER REPLACING IT.

The water filtration system removes particulates and biological contaminants as small as 0.1 micron from the supply water. During the water line disinfection procedure, the entire water filtration system and the incoming water line for the ADVANTAGE PLUS™ Reprocessor is disinfected.

Note: A water line and water filtration disinfection process must be performed whenever a water filter is replaced. Refer to *Chapter 2 Waterline and Water Filter Disinfection*.

Figure 4 Water Filtration System

1	Water inlet (1/2” NPT)	6	Water outlet	11	Communication cable connector
2	Inlet pressure gauge	7	1 micron filter	12	Bleed valve
3	1 micron filter outlet pressure gauge	8	0.4 micron filter	13	Bleed valve outlet
4	0.4 micron filter outlet pressure gauge	9	Disinfectant inlet	14	0.1 micron filter
5	0.1 micron filter inlet pressure gauge	10	Water filter feed line		

Water filters should be replaced at a minimum every six months for the 1.0 micron, 0.4 micron and the 0.1 micron filter. If the water pressure drops below 40 PSI or the difference between the gauges is greater than 5 PSI the corresponding filter needs to be replaced.

The following conditions must be met before changing a filter:

- No endoscope reprocessing cycles are running.
- No water line disinfection procedure is running.
- The inlet water supply is turned off.

You will need the following materials:

- A container to catch water.
- A filter bowl wrench.
- The necessary filter cartridges (see *Table 1*) (See *Appendix B* for replacement part numbers).

Table 1 Filter Cartridges

Key	Filtration Porosity	Filter Type	Minimum Replacement Schedule
1	0.1 micron	Hollow fiber	6 mos.
2	0.4 micron	Pleated	6 mos.
3	1 micron	Pleated	6 mos.

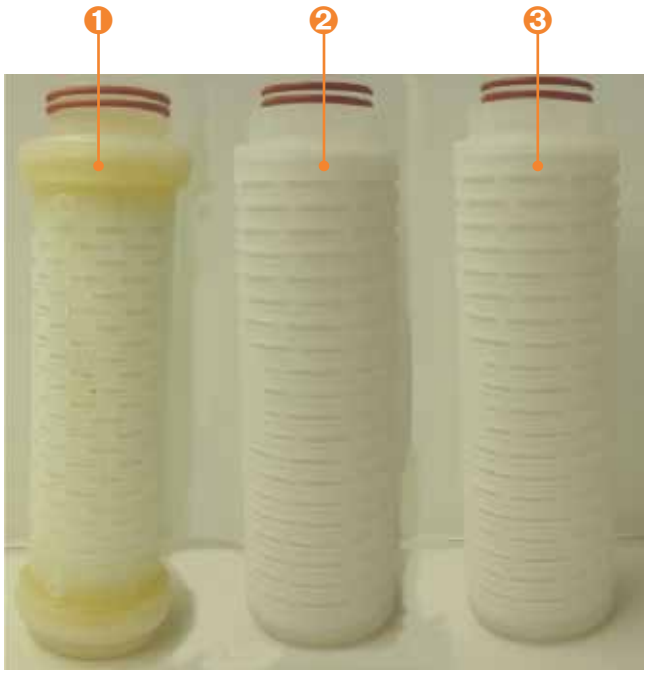


Figure 5 Filter Cartridges

Figure 6 Filter Cartridges in Place

1. Relieve the pressure in the filtration system by opening the bleeder valve on the filter system (rotate down).
2. Check the inlet pressure gauge to ensure that the pressure is at zero.
3. Place an empty container under the 1 micron filter housing and disconnect the Quick Connect fitting at the bottom of the housing. Allowing all of the water to empty out.
4. Using a filter bowl wrench, remove the 1 micron filter housing and discard the used filter cartridge.

Figure 7 Loosen Filter Housing

Figure 8 Remove Housing and Filter

5. Place a new filter in the housing, ensuring that the O-ring is in place.

Figure 9 Check O-Ring

6. Thread the housing onto the header and tighten by hand only.
7. Repeat the procedure to replace the 0.4 micron and 0.1 micron filter.

Figure 10 Open Bleed Valve

8. To remove the 0.1 micron filter rotate the used filter cartridge counterclockwise, pull downward, and discard.
9. To install a new 0.1 micron filter insert a new filter cartridge into the housing header and rotate clockwise until the tabs lock into place *Figure 11*.

Figure 11 Filter Mounting Tabs

10. Return the bleed valve to the closed position (rotate up).
11. Slowly open the main water supply valve and check for any leaks.

12. Run the **Water Sample** utility
    - Push **Menu** button
    - Log in
    - Select: **Program**
    - Select: **Utility Program**
    - Choose: **Take Water Sample**
13. Place a container under the bleed valve outlet tube and slowly open the bleed valve (s*ee figure 10*). Let the water run until it is a steady stream.
14. Close the bleed valve.
15. Push **Cancel** to stop water utility or allow to complete. No actual sample needs to be taken.
16. Perform a water line and water filtration disinfection procedure. Refer to *Chapter 2*.

CHAPTER 5

TROUBLESHOOTING

This chapter lists error messages you may encounter while using the ADVANTAGE PLUS™ Reprocessor. If the suggested action does not solve a problem or if the error recurs, contact your Technical Service representative.

INTRODUCTION

Error Reports

The ADVANTAGE PLUS™ Reprocessor can report and display different types of errors which signal and identify specific areas requiring attention. Error types include:

- **System Errors:** A communication problem identified by the prefix C with errors ranging from C-001 through C-099. This is an error caused by the Windows based PC or ADVANTAGE PLUS Reprocessor.
- **Barcode Errors:** A barcode problem identified by the prefix M with errors ranging from M-910 through M-940.
- **Endoscope Errors:** An endoscope problem identified by the prefix S with errors ranging from S-102 through S-177.
- **Reprocessing Cycle Errors:** A problem identified during the endoscope disinfection cycle identified by the prefix S with errors ranging from S-201 through S-297, and S-511 through S-832.
- **Control Errors (SCU):** Lists any deviations in the disinfection program as monitored by the SCU controller, and identified by the prefix S with errors ranging from S-300 through S-399.
- **Warning Errors:** An alert or warning identified so that the operator is aware of a machine condition that requires attention. Warnings are identified by the prefix W and range from W-701 through W-821.

Onscreen Program Progress

The disinfection program consists of phases and steps. For each disinfection cycle, the phase names, status, and run codes appear on the monitor. Information for the left module appears on the left side of the screen; information for the right module is on the right side.

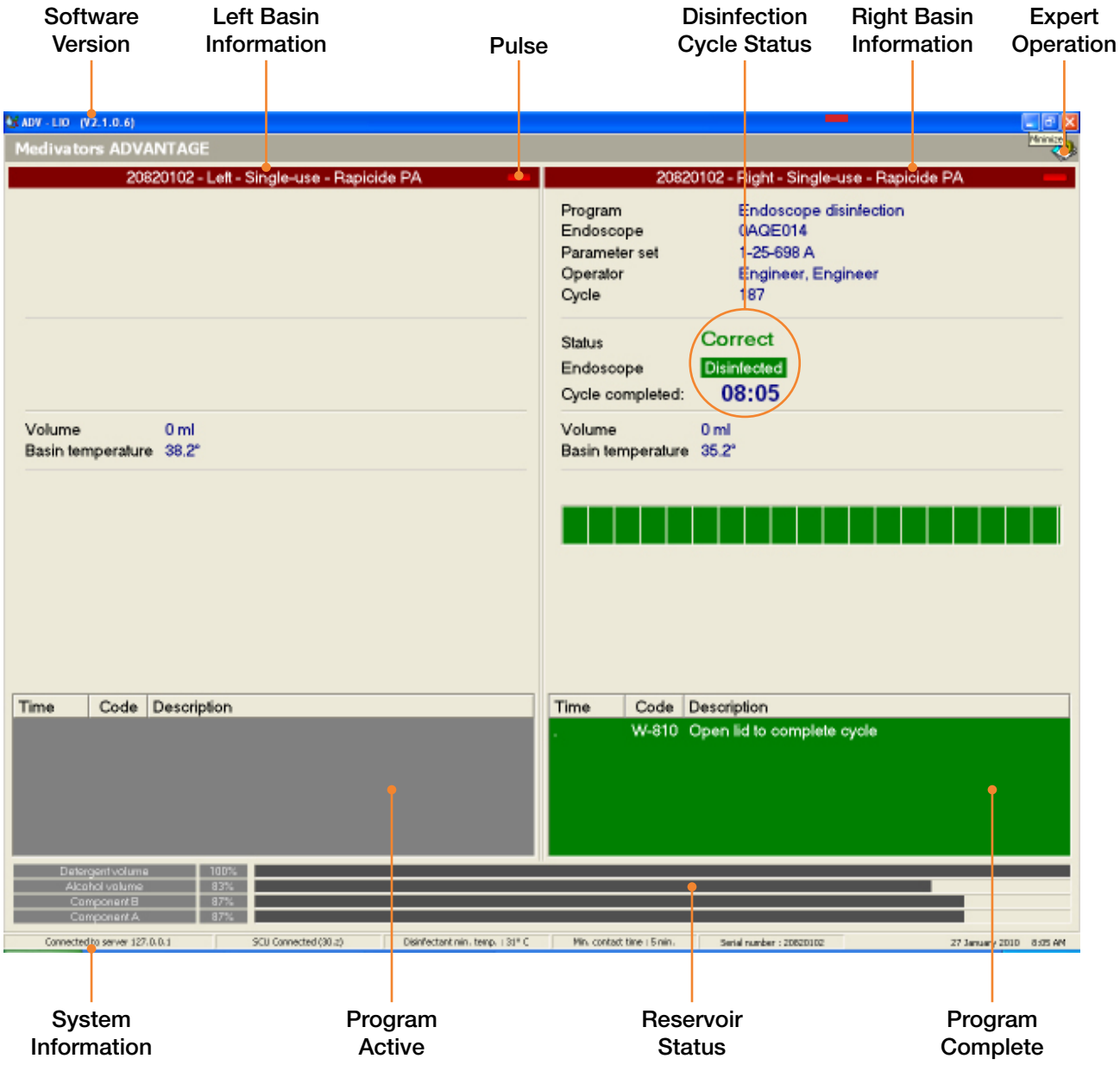


Figure 1 Disinfection Program in Process

Program Information

This field displays operator and endoscope information as well as the normal progress of the disinfection program. The expected end time, on the left, of each window is fixed. Time remaining on the right, is measured from the start of the cycle. This counter normally decreases as a cycle progresses, but may increase or become fixed if an error occurs. The progression of the steps, below the timers, is illustrated with blue time bars. The real time is measured from the start of each step or phase.

Expert Information

This field is visible and active to operators and system administrators with valid passwords. It provides extra information for maintenance and troubleshooting.

Cycle and Program Errors

Operator messages and errors appear in the Reports field and communicate cycle progress. An audible alarm also sounds to communicate certain information.

A code number and short description of the report or error is shown, along with the elapsed time at which it is generated. The most recent message is at the top of the field. The meaning of each screen color is shown in the table below.

Table 1 Screen Color and Program Status

	Screen Color	Program Status
1	Gray	Program in standby
2	Orange	Standby, with lid open or a warning is present
3	Blue	Cycle in progress
4	Red	Error or cycle failed, endoscope not disinfected
5	Green	Cycle completed successfully, endoscope disinfected

System Errors

Current system errors appear at the top of the screen in white letters on a red background. The message disappears once the error is corrected.

If a system error occurs during standby mode, a warning message appears as the fault occurs but disappears as the situation is corrected.

If the error occurs during a disinfection cycle, the program ends and fluids are pumped out of the basin. A **Recovery** program runs until a safe state is reached and the endoscope can be removed. The **Recovery** program can not be stopped by the operator.

System Information

The bar at the bottom of the screen provides system communication information, machine identification, and the software version.

ADVANTAGE PLUS™ Reprocessor software has two possible system connections:

1. ADVANTAGE PLUS Reprocessor PC to the ADVANTAGE PLUS Reprocessor (SCU).
2. ADVANTAGE PLUS Reprocessor PC to an external server (optional).

The two left-most fields on the bar indicate if the ADVANTAGE PLUS Reprocessor is connected to the database. The next field to the right indicates if the PC is correctly connected to the ADVANTAGE PLUS Reprocessor SCU. The round indicator lights are green when a connection has been established and gray when no connection exists.

ERROR OVERVIEW

Screen reports and errors are summarized by category and number in the following tables. More specific information including potential causes, and actions for each error are included following that. For complex problems, it is advisable to notify the maintenance department and/or your supervisor.

System Errors

Code	Description
C-001	SCU error: %d: %S
C-012	No hardware definition received. Hardware not initialized
C-015	Server disconnected. Selection aborted
C-016	Run could not be configured, check SQL-server connection
C-017	User data could not be retrieved check SQL-server connection
C-019	The clock has been synchronized with the server computer
C-021	The **Expert** control has been automatically closed, you have to log on again
C-030	The previous run has ended incorrectly. Program aborted to a safe situation
C-032	A failure occurred during the execution of a run. Program aborted to a safe state
C-033	Program aborted to a safe situation, but incorrect parameter set
C-040	The hardware definition contains an unknown signal: %d
C-042	Selected hardware definition not correct for “%s” type
C-052	Automatic start of program is not possible in the current state
C-053	Automatic program start up is not possible because another program is already active
C-054	Automatic start of program is not possible
C-060	**Delayed Start** of program is not possible in the current state
C-080	The tag-reader is not available
C-099	Internal **LIO** failure :

Barcode Errors

Code	Description
M-910	unknown barcode
M-920	unknown operator tag
M-922	The scanned tag is an unknown endoscope code
M-930	Barcode not found
M-940	The code “%s” is not the correct %s code

Endoscope Errors

Code	Description
S-102	Start not allowed: vent hookup block
S-103	Endoscope leak or connected incorrectly
S-104	Minor endoscope leak, cycle continuing safely
S-105	Leak test vented but pressure remains high
S-106	The block is not pressurized or is not connected
S-112	Start not allowed: vent hookup block
S-113	No flow: air channel
S-114	Blocked air channel
S-115	No pressure: air channel
S-116	Air channel disconnected
S-117	Air channel disconnected
S-122	Start not allowed: vent hookup block
S-123	No flow: biopsy channel
S-124	Blocked biopsy channel
S-125	No pressure: biopsy channel
S-126	Biopsy channel disconnected
S-127	Biopsy/Suction channel disconnected
S-132	Start not allowed: vent hookup block
S-133	No flow: jet channel
S-134	Blocked jet channel
S-135	No pressure: jet channel
S-136	Jet channel disconnected
S-137	Jet channel not connected
S-142	Start not allowed: Vent hookup block
S-143	No flow: suction channel
S-144	Blocked suction channel
S-145	No pressure: suction channel
S-146	Suction channel disconnected
S-147	Suction/biopsy channel disconnected
S-152	Start not allowed: Vent hookup block
S-153	No flow: water channel
S-154	Blocked water channel
S-155	No pressure: water channel
S-156	Water channel disconnected
S-157	Water channel disconnected
S-162	Start not allowed: vent hookup block
S-163	No flow: extra channel

S-164 Blocked extra channel
S-165 No pressure: extra channel
S-166 Extra channel disconnected
S-167 Extra channel disconnected
S-172 Start not allowed: Vent hookup block
S-173 No flow: elevator channel
S-174 Blocked elevator channel
S-175 No pressure: elevator channel
S-176 Elevator channel disconnected
S-177 Elevator channel disconnected

Reprocessing Cycle Errors

Code	Description
S-201	Internal machine fluid leak, check drip tray
S-203	Wrong connection block
S-211	Lid open
S-222	Start not allowed: check detergent pressure sensor
S-223	No flow detergent
S-224	Start not allowed: detergent level low
S-242	Start not allowed: check alcohol pressure sensor
S-243	No alcohol flow
S-244	Start not allowed: alcohol level low
S-271	Start not allowed: fluid in basin
S-272	Start not allowed: basin not empty
S-273	Basin suddenly empty
S-274	Basin not emptying
S-275	Basin level dropped
S-276	Basin minimum level not reached
S-241	Alcohol sensor defective
S-281	No incoming water flow
S-282	Water inlet flow too high
S-283	Water inlet flow too low
S-285	No water supply
S-286	Volume measurement V1 > V2
S-287	Volume measurement V1 < V2
S-288	Unrequested inlet water detected
S-289	External water supply valve failed
S-292	Basin temperature sensor defective
S-293	Basin temperature too high

S-294 Basin temperature too low
S-297 Basin temperature too high
S-511 Measure contact time too short
S-660 MRC validation failed
S-671 “Machine control” locked by the other side
S-672 Wrong system side
S-810 Check Part A container, run **Replace Fluids** utility
S-811 Check Part B container, run **Replace Fluids** utility
S-814 Part A fill sensors do not agree
S-815 Part B fill sensors do not agree
S-819 Dosing reservoir A empty, run **Replace Fluids** utility
S-820 Part A container empty, run **Replace Fluids** utility
S-821 Part B container empty, run **Replace Fluids** utility
S-824 Dosing reservoir A not empty
S-825 Dosing reservoir B not empty
S-831 Air cylinder does not charge
S-832 Air cylinder not discharged

Control Errors (SCU)

Code	Description
S-300	SCU message: F.../S…/T…
S-301	SCU in “OK” state
S-302	SCU : wrong configuration
S-304	SCU no connection
S-310	Spray arm speed below minimum
S-311	Spray arm speed above maximum
S-350	Manual control active
S-360	Stopped by the operator

Warnings Errors

Code	Description
W-701	SCU: No connection
W-702	SCU: Wrong configuration
W-703	SCU: Incorrect status and lid inactive
W-704	SCU: Incorrect status
W-705	SCU: in “OK” status
W-711	Lid is open.
W-712	Lid will not open
W-713	Lid will not close
W-715	Basin not empty
W-716	Fluid leak detected
W-721	Water temperature sensor defective
W-743	Sensor S03: Detergent high
W-744	Sensor S17 Minimum level high
W-749	Sensor S24: Alcohol high
W-751	Sensor S11 Leak test high
W-753	Sensor S25 high
W-754	Sensor S26 high
W-757	Sensor S33 high
W-764	Channel sensor S04 high (Air)
W-765	Channel sensor S05 high (Biopsy)
W-766	Channel sensor S06 high (Jet)
W-767	Channel sensor S07 high (Suction)
W-768	Channel sensor S08 high (Water)
W-769	Channel sensor S09 high (Extra)
W-770	Channel sensor S10 high (Elevator)
W-800	Manual control active
W-801	Purge in progress
W-802	Venting alcohol line, close lid
W-803	Discharging air cylinder, close lid
W-805	Left side controls the water line disinfect
W-810	Open lid to complete cycle
W-820	Disinfectant in the basin (Lid locked)
W-821	Disinfectant in supply lines, (Lid locked)

SYSTEM ERRORS

C-001: Asi error: %d: %s	
Cause 1:	There is a temporary interruption in the connection between the SCU and the ADVANTAGE PLUS™ Reprocessor machine.
Action:	Check the message at the lower left of the screen. If it says “SCU connected” then the connection has been restored. Press the **Open/Close** button or the **Start** button to continue. If the message says “ASi disconnected” then attempt the action listed below.
Cause 2:	There is a power failure in the machine or the plug is loose.
Action:	Check the plug. If it is not loose, report the failure to the maintenance department.

C-012: No hardware definition received. Hardware not initialized.	
Cause:	This error occurs if there is a problem with the SCU control software. This definition is the layout of the SCU control and is determined by the configuration of machine. Possible issues are in the following list: • Installation of the SCU layout is not found. • The **LIO** program was incorrectly installed. • Software problem. • Communication problem with the ASi interface.
Action:	Report the error to the ADVANTAGE PLUS Reprocessor manager.

C-015: Server disconnected. Selection aborted.	
Cause:	The connection to the database has been interrupted. • The **LIO** program cannot retrieve the overview lists and the selection screen is empty. • The connection to the server is interrupted in stand-by mode. • It is not possible to start a program.
Action:	Report the error to the system manager. As long as “Disconnected from server” appears at the bottom of the screen, the program can not be restarted.

C-016: Run could not be configured, check SQL-server connection.	
Cause:	The system is unable to retrieve information from database to set up a run.
Action:	Report the error to the ADVANTAGE PLUS Reprocessor manager.

C-017: User data could not be retrieved, check SQL-server connection.	
Cause:	The system is unable to retrieve information from database to set up a run.
Action:	Report the error to the ADVANTAGE PLUS Reprocessor manager.

C-019: The clock has been synchronized with the server computer (%s).	
Cause:	If the ADVANTAGE PLUS™ Reprocessor clock and the server clock have a time difference of more than 30 seconds, the check will be synchronized.
Action:	No action is required.

C-021: The Expert control has been automatically closed, you have to log on again.	
Cause:	The **Expert** screen has timed out.
Action:	To continue using the **Expert** functions login again.

C-030: The previous run has ended incorrectly. Program aborted to a safe situation.	
If a system error occurs, then it is not possible to create a correct run report. If the error is repaired, then the error message disappears and the **Recovery** program automatically runs to rinse the endoscope with water so that it can be safely removed of the machine. This program can not be stopped and the endoscope is not disinfected.	
Cause 1:	A black screen means the program is not visible. Possible causes are as follows: • The PC was switched off. • There is a PC defect. • There was a power failure.
Action:	Try pressing the **On/Off** switch on the PC. If this does not solve the error, contact the maintenance department.
Cause 2:	There is a communication problem so the program cannot be run correctly. Possible causes are as follows: • There is a cable fault. • A cable is loose. • There is a program error. • The ADVANTAGE PLUS Reprocessor control unit is defective. • There is a blown or defective fuse.
Action:	Contact the maintenance department and the system manager.
Cause 3:	There is a communication problem with the SCU interface and message W-701 is also on the screen. Possible causes are as follows: • There is a fault with the SCU interface. • A network cable is disconnected. • A cable is faulty. • There is a communication problem with the server. • There is a server error.
Action:	Check the cable connection between the network and the machine. Restore the connection if possible and start the machine program again. If you are unable to repair the connection, report the error to the system manager.
Cause 4:	The **LIO** program was interrupted. Message W-703 also appears on the screen and the cover is locked.
Action:	Start the **Recovery** program.

C-032: A failure occurred during the execution of a run. Program aborted to a safe situation.	
If an SCU error occurs, then it is not possible to carry out a correct disinfection cycle. If the error is repaired, then this C-032 message appears and the **Recovery** program is automatically selected. The endoscope is rinsed with water so that it can be safely removed from the ADVANTAGE PLUS™ Reprocessor but it will not be disinfected. The **Recovery** program works automatically and can not be stopped. The endoscope must be run through a complete disinfection program before use.	
Cause 1:	There is an internal communication problem with the PC. Possible causes are as follows: • There is a cable fault. • A cable is loose. • There is a program error. • The SCU interface in the ADVANTAGE PLUS Reprocessor is defective. • A fuse is blown or defective.
Action:	Report the problem to the maintenance department.
Cause 2:	A new program was started while another one was already active.
Action:	Press the **Start** button to start the **Recovery** program.

C-033: Program aborted to a safe situation, but incorrect parameter set.	
Cause 1:	An incorrect parameter set was selected for the machine disinfection or the **Recovery** program.
Action:	Select the correct parameter set for the **Recovery** program.
Cause 2:	The **LIO** program was interrupted or shut down during a run. Message W-703 also appears and the lid can not be opened.
Action:	Start a **Recovery** program.

C-040: Hardware definition contains an invalid signal %d.	
Cause:	An incorrect address is entering the controller from the SCU.
Action:	Report the error to the maintenance department. Note the unknown signal number: nn.

C-042: Selected hardware definition not correct for “%s” type.	
Cause:	The system settings parameters for the left/right unit type have not been selected.
Action:	Report the error to the ADVANTAGE PLUS Reprocessor manager.

C-052: Automatic start of program is not possible in the current state.	
Cause 1:	There is warning text in the report field.
Action:	Ensure that all error messages are resolved. Select a machine disinfection auto start. If necessary, consult the ADVANTAGE PLUS™ Reprocessor manager.
Cause 2:	An auto start for endoscope disinfection is already set up.
Action:	Cancel the auto start for the endoscope disinfection.

C-053: Another program is active.	
Cause:	Machine disinfection should start but there is an active cycle running.
Action:	Let the current program run to completion. When the ADVANTAGE PLUS Reprocessor is ready and the basin cover is still open, insert the machine disinfection block and close the cover. The machine disinfection will start automatically.

C-060: Delayed Start of program is not possible in the current state.	
Cause 1:	Warning messages (numbers W700-W799) are present on the screen during automatic start up of a disinfection program.
Action:	Ensure that the messages are resolved. Select the automatic restart. Consult the maintenance department if necessary.
Cause 2:	Auto start for another program is already set up.
Action:	For the **Delayed Start**, the other program must first be shut down.

C-080: Tag-reader not available.	
Cause:	The identification system is defective.
Action:	Report the error to the maintenance department and the ADVANTAGE PLUS Reprocessor manager to have the chip (=Tag) system disconnected.

C-099: Internal LIO failure : %s	
Cause:	A wrong selection was executed when setting the machine system parameters.
Action:	Report the error to the ADVANTAGE PLUS Reprocessor manager to correct the settings. Then restart the program.

BARCODE ERRORS

M-910: Unknown barcode.	
If the system is set up to require the use of the barcode reader, manual selection with the cursor is not possible.	
Cause 1:	The barcode belongs to another item to be read.
Action:	Check if the barcode type is the same as the selected input field on the screen. Scan the correct barcode again.
Cause 2:	The barcode is not entered in the **Management** system.
Action:	Report the error to the ADVANTAGE PLUS™ Reprocessor manager along with a request to add the barcode for the selected item.

M-920: Unknown operator tag.	
The system is set up to require use of the automatic identification system for operator identification.	
Cause:	The read tag is entered incorrectly or is not reported in the **Management** database.
Action:	Report the situation to the ADVANTAGE PLUS Reprocessor manager along with a request to add the correct tag code to the operator list.

M-922: The scanned tag is an unknown endoscope code.	
The system is set up to require use of the automatic identification system for endoscope selection.	
Cause:	The read tag is entered incorrectly or is not reported in the **Management** database.
Action:	Report the situation to the ADVANTAGE PLUS Reprocessor manager along with a request to add the correct tag code to the endoscope list.

M-930: Barcode not found.	
Cause:	The barcode was read but the **OK** ✓ button was not enabled.
Action:	Click the **OK** ✓ button.

M-940: The code “%s” is not the correct %s code.	
Cause:	An incorrect code or lot number was entered while performing the **Replace Fluids** utility for either the detergent or alcohol.
Action:	Re-run the **Replace Fluids** utility and enter a valid code.

ENDOSCOPE ERRORS

S-102: Start not allowed: Vent hookup block.	
This message appears if no disinfection program is active and the leak test sensor is on. When this message occurs, no disinfection program can be started.	
Cause 1:	If the endoscope is vented too quickly, then it remains pressurized, causing the leak test sensor to be on.
Action:	Stop the program and disengage the terminal block to reduce the pressure. This causes the message W-751 to disappear. If the error message remains, see the next cause and action below.
Cause 2:	A faulty sensor faulty continues to incorrectly read on.
Action:	Report the situation to the maintenance department for repairs.
Cause 3:	The air valve leaks.
Action:	Report the error to the maintenance department.

S-103: Endoscope leak or connected incorrectly.	
Cause 1:	The endoscope or connection hose is leaking seriously. The leak test connection is not in order.
Action:	Use a manual leak tester (with a pressure gauge) to see if the endoscope leaks. If so, have the endoscope repaired. If there is no leak, check the endoscope connection and restart the program. If the report recurs, consult the maintenance department.
Cause 2:	The block is out of alignment to the connection plate in the rinse basin.
Action:	Stop the program, disconnect, and place the block anew. Restart the program.

S-104: Minor endoscope leak, cycle continuing safely.	
Cause 1:	Very tiny leak in the endoscope.
Action:	Using the pressure gauge, pump the endoscope to pressurize and check to see if it is leaking. If there is a leak, report it to the maintenance department. If the endoscope is not leaking, see other causes of the error below.
Cause 2:	Very tiny leak in the leak test system of the ADVANTAGE PLUS™ Reprocessor, the terminal connector, or the connection block.
Action:	Consult the maintenance department to repair the leakage.
Cause 3:	A power failure vents the endoscope and the error message follows.
Action:	If the machine automatically started up after the error, no further action is required. Otherwise, contact the maintenance department.
Cause 4:	If the endoscope stays pressurized, a sensor is faulty.
Action:	Report the situation to the maintenance department.

S-105: Leak test vented by pressure remains high.	
Cause 1:	There may be an air valve defect if air does not vent from the endoscope during the ventilation process.
Action:	Try to start the process again by pressing the **Start** button. If the message recurs, press the **Stop** button. Remove the connection block and check to see if air is escaping (there is a hissing noise). If so, report it to the maintenance department. If air is not escaping, see other possible causes of the error below.
Cause 2:	The leak test sensor is defective or out of alignment. This causes the signal to be maintained after the block is removed.
Action:	Report to the maintenance department for repairs.
Cause 3:	The flow control air valve is contaminated or out of alignment.
Action:	Try to start the process step again by pressing the **Start** button. If the error recurs, ask the maintenance service to align the valve.

S-106: Block not pressurized or not connected.	
Cause 1:	The endoscope is not properly connected.
Action:	Stop the machine and check if the leak test connections and the terminal block are properly placed. Connect the leak test and block again. Start the program.
Cause 2:	Machine fault.
Action:	Consult the maintenance department.

S-112, S-122, S-132, S-142, S-152, S-162, S-172: Start not allowed: Vent hookup block.

This report occurs for the following channels:

- Air
- Biopsy
- Elevator
- Extra
- Jet
- Suction
- Water

These errors appear if a disinfection program is selected and the specific channel sensor is on. When this message occurs no disinfection program can be started.

Stop the program and open the lid. An endoscope warning (W-764 through W-770) appears. This message must be cleared before a restart takes place.

Cause 1:	The endoscope channel is blocked, causing the sensor to be on.
Action:	Disconnect the connector from the channel in the endoscope. If the message disappears, report the blocked endoscope to the maintenance department. If the message remains, see other possible causes of the error below.
Cause 2:	The connection block is blocked when the endoscope is not connected.
Action:	Disconnect the connection block and replace it with another. If the message disappears, let the maintenance department unclog the block. If the message remains, see other possible causes of the error below.
Cause 3:	The channel sensor is defective or out of alignment.
Action:	Report the faulty sensor to the maintenance department.

S-113, S-123, S-133, S-143, S-153, S-163, S-173: No flow: channel.	
This report occurs for the following channels: • Air • Biopsy • Elevator • Extra • Jet • Suction • Water	
Action:	First try the process step again by pressing the **Start** button. If the report recurs, press the **Stop** button.
Cause 1:	Channel connector not connected.
Action:	Press the **Stop** button and connect the endoscope. Start the program again.
Cause 2:	The connector terminal block handle is not connected, or the block is out of alignment.
Action:	Press the **Stop** button and open the cover. Place the terminal block and make sure that the handle is fastened in the lock pins on both sides. Start the program again.
Cause 3:	An incorrect program choice was selected for the instrument.
Action:	Check that the number of channel connections (excluding the leak test) agrees with the statement on the screen after “Parameter set.” In the case of an anomaly or doubts, stop the program and report the error directly to the system manager.
Cause 4:	Wrong block.
Action:	Check that the number of hoses on the block (excluding the leak test) is the same as the number of channel connections on the endoscope. In the case of a deviation, replace the block with the correct implementation and start the program again.
Cause 5:	Too little pump pressure or the channel sensor is faulty.
Action:	Consult the maintenance department. After restart, the channel sensor does not become high. Press the **F1** or **F2** buttons to see the signal units.
Cause 6:	The sprayer is worn, which causes too much pressure (flow) loss along the bearing.
Action:	A horizontal spray pattern of the leaking water can be seen with a restart. Report the error to the maintenance department.
Cause 7:	The channel sensor is out of alignment.
Action:	After restart the signal blinks too much and is unstable. Press the **F1** button to signal units. Report the situation to the maintenance department for carrying out calibration.

S-114, S-124, S-134, S-144, S-154, S-164, S-174: Blocked channel.	
This report occurs for the following channels: • Air • Biopsy • Elevator • Extra • Jet • Suction • Water Try to start the process again by pressing the **Start** button. This can be done once. If the message recurs, the **Stop** button must be pressed.	
Cause 1:	Connection hose(s) is kinked or pinched.
Action:	Check all hoses. If kinked or pinched, straighten out hose(s) and start the program again. If none of the hoses is kinked or pinched, see other possible causes of the error below.
Cause 2:	Channel blocked.
Action:	If the channel is blocked, have the endoscope checked or repaired. If there is no blockage, try the endoscope in a different ADVANTAGE PLUS™ Reprocessor. If the error is repeated, check the connection block. See other possible causes of the error below.
Cause 3:	Connection block obstructed.
Action:	Press a properly fitting hose of a small bellows pump (manual leak test) in the holes on the underside of the terminal block. Squeeze the bellows. Air should come out of the channel connection. If there is a blockage, consult the instrument service manual to unclog the connection block. If the block is not obstructed, then a machine fault is probably the cause. Consult the maintenance department.

S-115, S-125, S-135, S-145, S-155, S-165, S175: No pressure: channel.	
This report occurs for the following channels: • Air • Biopsy • Elevator • Extra • Jet • Suction • Water	
Cause 1:	There is insufficient air pressure to blow the moisture out of the channels.
Action:	Press the **Start** button to try the process step again. If the message recurs, press the **Stop** button.
Cause 2:	A hose is detached.
Action:	Verify all hoses are still connected to the endoscope then start the program again.
Cause 3:	Incorrect parameter set.
Action:	When in doubt or if the wrong parameter is set, report the problem to the ADVANTAGE PLUS Reprocessor manager.

S-116, S-126, S-136, S-146, S-156, S-166, S-176: Channel disconnected.	
This control checks interconnected endoscope channels and the message is given per channel, i.e.: • Air • Biopsy • Elevator • Extra • Jet • Suction • Water	
Cause 1:	There is a connector loose from the endoscope.
Action:	If you see a loose connection, press the **Stop** button. Close the program, connect the loose connection, and restart the cycle.
Cause 2:	It is not clear if all channels are connected.
Action:	Try to start the process again by pressing the **Start** button. This may be tried once. If the message reoccurs, you must press the **Stop** button and call Maintenance.

S-117, S-127, S-137, S-147, S-157, S-167, S-177: Channel disconnected.	
This control checks small endoscope channels and the message is given per channel, i.e.: • Air • Biopsy • Elevator • Extra • Jet • Suction • Water	
Cause 1:	There is a connector loose from the endoscope.
Action:	If you see a loose connection, press the **Stop** button. Close the program, connect the loose connection, and restart the cycle.
Cause 2:	It is not clear if all channels are connected.
Action:	Try to start the process again by pressing the **Start** button. This may be tried once. If the message reoccurs, you must press the **Stop** button and call Maintenance.

REPROCESSING CYCLE ERRORS

S-201: Internal machine fluid leak, check drip tray.	
If the message report is visible, then the program can not be stopped. After drying out, it can take 5–10 minutes before the sensor message disappears. If the sensor is released, only the program can be stopped.	
Cause 1:	There is liquid in the front of the machine as result of a leak.
Action:	If possible, close the water supply tap and consult the maintenance department.
Cause 2:	If the tray is dry, a sensor is out of alignment.
Action:	Remove the two containers and dry the green sensor with a cloth. If the message remains, report the error to the maintenance department to have the sensor aligned, or to have the program shut down for technical service.

S-203: Wrong connection block.	
The machine disinfection automatically started and checked whether the hot water block is fitted.	
Cause 1:	No connection block is present.
Action:	Place the machine disinfection connection block and then press the **Start** button.
Cause 2:	The endoscope connection block is present.
Action:	Exchange this block for a machine disinfection connection block and press the **Start** button.
Cause 3:	The machine disinfection connection block is present.
Action:	Try pressing the **Start** button again. If the message recurs, then consult the maintenance department.

S-211: Lid open.	
Cause 1:	The lid is closed: During the program, the lid sensor has failed and now indicates that the cover is open.
Action:	The program can be stopped only via the **Expert Operation**. Report the error to the maintenance department to adjust the sensor, if necessary.
Cause 2:	During the program the lid was opened.
Action:	Close the lid and press the **Start** button to continue the program.

S-222: Start not allowed: Check detergent pressure sensor.	
Cause:	The detergent sensor is out of alignment or faulty.
Action:	Report the fault to the maintenance department.

S-223: No detergent flow.	
Cause 1:	The detergent reservoir is empty.
Action:	Check if the detergent reservoir is empty. If so, fill the reservoir. If there is sufficient detergent in the reservoir, press the **Start** button. If the error repeats, see the alternate cause below.
Cause 2:	The detergent sensor or pump is defective.
Action:	Report the fault to instrument service.

S-224,S-244: Start not allowed : Detergent level low. Start not allowed : Alcohol level low.	
Cause 1:	The reservoir is empty.
Action:	Check if the level of fluid in the reservoir. If it is empty, fill or replace the reservoir. If there is sufficient fluid in the reservoir, press the **Start** button. If the error repeats, see the alternate cause below.
Cause 2:	The sensor in the reservoir is defective.
Action:	Report the fault to Maintenance.

S-241: Alcohol sensor defective.	
Cause:	The alcohol sensor is out of alignment or faulty.
Action:	Report the fault to the maintenance department.

S-242: Start not allowed: Check alcohol pressure sensor.	
Cause:	The alcohol sensor is out of alignment or faulty.
Action:	Report the fault to the maintenance department.

S-243: No alcohol flow.	
Cause 1:	The alcohol reservoir is empty.
Action:	Check if the alcohol reservoir is empty. If so, fill the reservoir. If there is sufficient alcohol in the reservoir, press the **Start** button. If the error repeats, see the alternate cause below.
Cause 2:	The alcohol sensor or pump is defective.
Action:	Report the fault to instrument service.

S-271: Start not allowed : Fluid in basin.	
This message appears if no disinfection program is active and the level sensor is on. When this report occurs, a disinfection program can not be started.	
Cause 1:	Water in the rinse basin is causing the level sensor to report liquid.
Action:	Wait until the basin is empty. Make sure that the cover is closed so that the basin can automatically run empty.
Cause 2:	The basin level sensor is faulty, causing it to remain high even though the basin is empty.
Action:	Report the fault to instrument service for repairs.

S-272: Start not allowed : Basin not empty.	
This message appears if no disinfection program is active and the basin empty sensor is on. When this message occurs, a disinfection program can not be started.	
Cause 1:	Water in the rinse basin is causing the level sensor to report liquid.
Action:	Wait until the basin is empty. Make sure that the cover is closed so that the basin can automatically run empty.
Cause 2:	The volume report on the screen is not 0, so the system is not released.
Action:	Close the cover and wait until the message moves to zero. This may take a few minutes. If there is no effect, see the following cause below.
Cause 3:	The basin empty sensor is faulty, causing it to read high when the basin is empty.
Action:	Report the fault to instrument service for repairs.

S-273: Basin suddenly empty.	
Cause 1:	The drain valve leaks due to contamination. The rinse basin empties during rinsing.
Action:	Check if there is still any liquid in the basin. If the basin is empty, press the **Stop** button and report the fault to the maintenance department. If the basin is filled see the cause below.
Cause 2:	The basin empty sensor is faulty.
Action:	Press the **Stop** button and report the error to the maintenance department.

S-274: Basin not emptying.	
Try the process again by pressing the **Start** button. If the message recurs, press the **Stop** button.	
Cause 1:	The drain is blocked.
Action:	Check if the rinse basin runs empty properly. If it does not, contact the maintenance department. If is does, see the causes listed below.
Cause 2:	The drain valve is faulty if the volume level does not go down.
Action:	If the level does not go down, report the error to the maintenance department. If the level goes down, see the causes listed below.
Cause 3:	The drainage hose sags which causes the rinse basin to run empty too slowly.
Action:	Check the drainage hose. If it is sagging, report the situation to the maintenance department. If the hose does not sag, see the cause listed below.
Cause 4:	The basin empty sensor is faulty.
Action:	Report the situation to instrument service.

S-275: Basin level dropped.	
Cause 1:	Liquid ran out of the basin due to contamination on the valve seal.
Action:	Report the fault to the maintenance department. If the tank is full, press the **Start** button to try running the program. If the tank is empty, change the tank and restart the program.
Cause 2:	The drainage valve opened due to an error control.
Action:	Report the fault to the maintenance department.
Cause 3:	The rinse basin level sensor is defective or contaminated.
Action:	Report the fault to the maintenance department.

S-276: Basin minimum level not reached.	
Water must be present in the rinse basin to check for the correct connection block.	
Cause 1:	The drainage valve leaks.
Action:	Press the **Start** button and to see if water drains from the basin. If it doesn't, contact the maintenance department. If water drains, see the cause below.
Cause 2:	The basin empty sensor is defective so the control of the block is incorrectly carried out.
Action:	Report the fault to the maintenance department.

S-281: No incoming water flow.	
Cause:	There is water in the rinse basin but the volume is not measured.
Action:	Press the **Stop** button. Consult the maintenance department.

S-282: Water inlet flow too high.	
Press the **Start** button to attempt to run the process step again. If the message recurs, press the **Stop** button.	
Cause:	The rinse basin fills too quickly because the water supply pressure is too high.
Action:	Press the **Stop** button and report the situation to the maintenance department.

S-283: Water inlet flow too low.	
Press the **Start** button to attempt to run the process step again. If the message recurs, press the **Stop** button.	
Cause 1:	The basin fills too slowly because the water supply pressure is too low or the filter is contaminated.
Action:	Press the **Start** button to continue the program and pay close attention to the water as it enters the basin. If the flow is weak, report it to the maintenance department. If the flow is normal, see the possible cause below.
Cause 2:	The volume meter is contaminated or defective.
Action:	Press the **Stop** button and report the situation to the maintenance department.

S-285: No water supply.	
Cause 1:	The water tap is closed.
Action:	Check the water tap. If it is open, see the possible cause below. If the tap is closed, open it and press the **Start** button.
Cause 2:	The water supply valve is defective.
Action:	Report the situation to the maintenance department.

S-286: Volume measurement V1 > V2.	
Cause:	The volume measurement and volume control indicate deviating values.
Action:	Stop the program and report the error to the maintenance service. The flow meters should be recalibrated.

S-287: Volume measurement V1 < V2.	
Cause:	The volume measurement and volume control indicate deviating values.
Action:	Stop the program and report the error to the maintenance service. The flow meters should be recalibrated.

S-288: Unrequested inlet water detected.	
Cause:	The water supply valve is leaking and may dilute the disinfectant.
Action:	Report the error to the maintenance department.

S-289: External water supply valve failed.	
Cause:	The water supply valve on the filter unit is leaking, so machine disinfection can not be performed.
Action:	Report the error to the maintenance department.

S-292: Basin temperature sensor defective.	
This error occurs independently of the software and is an extreme situation. Pressing the **Stop** button has no effect. Interrupting the program is only recommended after a technician has judged the situation. The program can be stopped via the **Expert Operation**. After resolving the fault, the program can be continued.	
Cause:	The temperature sensor is defective if the temperature message on the screen is higher than 100°C.
Action:	Report the error to the maintenance department.

S-293: Basin temperature too high.	
Press the **Start** button to start the process step again. If the message recurs, press the **Stop** button.	
Cause 1:	The drainage block is too warm after a disinfection program.
Action:	Wait five minutes, or pour cold water in the rinse basin to see if the temperature indicated on the screen drops.
Cause 2:	The setting or mixing valve is out of order, causing the supplied water to be too hot.
Action:	Press the **Stop** button and check or adjust the setting of the mixing valve. Wait for a while until the water in the machine has cooled down. Then start the program again.

S-294: Basin temperature too low.	
Press the **Start** button to start the process step again. If the message recurs, press the **Stop** button.	
Cause 1:	The adjustment or mixing valve is out of order, causing the water supply to be too cold.
Action:	Contact the maintenance department. Press the **Stop** button and check or adjust the mixing valve. Start the program and check if the temperature indicated on the screen is correct for the program.
Cause 2:	The warm water supply is stagnated.
Action:	Press the **Stop** button and consult the maintenance department.

S-297: Basin temperature too high.	
This error occurs independently of the software and is an extreme situation. Pressing the **Stop** button has no effect. Interrupting the program is only recommended after a technician has judged the situation. The program can be stopped via the **Expert Operation**. After resolving the fault, the program can be continued.	
Cause:	The water temperature in the rinse basin is too high: • Instrument disinfection: >50°C. • Machine disinfection: >90°C.
Action:	Stop the program and report the fault to the maintenance service.

S-511: Measured contact time is too short.	
The prescribed contact time is a sum of the time for different steps (SV + SS + SC + RS = option).	
Cause 1:	There was a change in the drain and fill time for the basin.
Action:	Report the error to Maintenance so they can recalibrate.
Cause 2:	The program parameters have been changed.
Action:	Report the fault to the system administration.

S-660: MRC validation failed.	
Cause:	At the end of the cycle, the operator determined the disinfectant sample failed the MRC validation test and pressed the **Stop** button as directed.
Action:	Replace the part A and part B containers and rerun the cycle.

S-671: “Machine Control” Locked by the other side.	
Cause:	The machine disinfection program is active. It is not possible to use this side of the machine.
Action:	Wait until the program has run completely.

S-672: Wrong system side.	
Cause:	The machine disinfection program is started from the right side rather than the left side.
Action:	Cancel the selection from the right side and restart it on the left side.

S-831: Air cylinder does not charge.	
Cause:	The cylinder is used to check connectivity from the endoscope to the ADVANTAGE PLUS™ Reprocessor. The cylinder is not filled so the check can not be performed.
Action:	This is the last step of the disinfection cycle. When all channels are still connected, the endoscope is properly disinfected. Visually check the connection and report the error to maintenance.

S-832: Air cylinder not discharged (cylinder pressurized).	
Cause 1:	The cylinder is used to check connectivity from the endoscope to the ADVANTAGE PLUS Reprocessor. The cylinder can not be vented after the check is performed.
Action:	Report the error to maintenance.

CONTROL ERRORS (SCU)

S-300: SCU.	
The report codes are as follows: • F = error number • S = step number where the error occurred in the program After an error S-300, the phase is stopped and the program automatically goes to the post-rinse phase (a safe run down process). The possible errors are listed in *Table 2* below.	
Cause 1:	The **Safety Control (SCU)** program detects an error. A sensor or valve may have had an incorrect status for a short period of time so the program was rejected as unsafe. If the fault occurred at the end of a step, the message is in the run report of the next step.
Action:	A correct description is important for a good analysis. • Note the codes and the text. • Report the fault and description to the maintenance department. • Wait until the program has stopped. • Press the **Open/Close** button. • Start a restore program. • Restart the endoscope disinfection.
Cause 2:	A PC error disrupts the program. The ASC signals the unsafe situation and sends an error message.
Action:	Note the code and description. Evaluate if the PC is working. Report the fault and description to the maintenance department.

Table 2 S-300 Control Error Details

Error Number	Description	Additional Details
F012	Incorrect step	PC software error. An active program step is not programmed into the SCU.
F013	Wrong step sequence	The **Stop** button is pressed after a run failure. The program skipped over steps to finish the run. End the program via the **Open/Close** button and operator selection.
F014	S14 outside cal. limits	The volume measurement is out of alignment due to contamination, a defective meter, or incorrect calibration.
F015	S16 outside cal. limits	
F021	Minimum time	**LIO** program step time duration deviates from **SCU** program control time; or an error report lasted too long before **Start** or **Stop** button was pressed.
F022	Maximum time	
F031	Lid open	During a disinfection program, the cover sensor is off or the air valve is operated manually. A mechanical defect of either of the components can create an unsafe situation.
F032	Lid open	

Error Number	Description	Additional Details
F041	Air channel	To control flow, the relevant channel sensor must read high or low for a minimal period of time. A “high” error occurs if a pump or valve is broken, or if the sensor is defective or blinks. A “low” error may be caused by a partially-blocked channel or terminal block.
F042	Biopsy channel	
F043	Jet channel	
F044	Suction channel	
F045	Water channel	
F046	Extra channel	
F047	Elevator channel	
F051	Basin empty	The basin empty sensor does not detect the rinse basin draining. If there is water in the basin, the sensor is defective or the drainage hose is blocked. If when adding disinfectant, the basin empty sensor does not go on, the sensor is out of alignment, is defective, or the endoscope housing is blocking the flow of disinfectant.
F052	Minimum level	The basin full sensor is not activated when the basin fills. The sensor is contaminated or the water supply is too slow. During rinsing the basin full level sensor reads incorrectly due to a valve leak.

Error Number	Description	Additional Details
F053	Dosing reservoir A not empty	Part A dosing reservoir not emptied at end of delivery
F054	Dosing reservoir B not empty	Part B dosing reservoir not emptied at end of delivery
F055	Dosing reservoir A not full	Part A dosing reservoir is not full at start of delivery
F056	Dosing reservoir B not full	Part B dosing reservoir is not full at start of delivery
F057	Dosing pump A	Part A fill pump is on during delivery
F058	Dosing pump B	Part B fill pump is on during delivery
F062	Detergent	The relevant sensor is activated when it is not applicable in the step. When adding disinfectant or detergent, a message appears if the minimal dosage time is not achieved or the maximum dosage time was exceeded.
F072	Pump detergent	The pump runs at the incorrect time due to a software or electronics error.
F073	Pump channels	
F074	Pump alcohol	Alcohol pump high during step
F075	Minimum spray arm speed	Spray arm spinning less than 15 rpm
F076	Maximum spray arm speed	Spray arm spinning more than 250 rpm
F081	Drainage valve	The valve is open at the wrong step due to a software or electronics error.
F082	Water inlet	
F091	Volume change	The volume meter counts pulses at the wrong step, possibly due to a leaking supply valve.
F092	Volume minimum	When filling the rinse basin, the measured volume is less than the minimum or more than the maximum setting.
F094	V1 > V2	During filling the V2 meter verifies the amount measured by V1. The deviation between the two meters is greater than 15%.
F095	V1 < V2	
F101	Max temperature exceeded	The water is warmer than the upper limit (40°C) or colder than the lower limit (30°C). Water temperature adjustment is done externally.
F102	Temperature below minimum	
F103	Basin temperature	Temperature sensors differ by more than 3ºC

S-301: SCU in “OK” state.

S-302: SCU : Wrong configuration.	
The PC communicates with the SCU operation interface in the ADVANTAGE PLUS™ Reprocessor. This interface transmits a signal every 20 msec to check the status of the signal in and out of the PC. If this communication stops or is interrupted the error appears.	
Cause:	The **Safety Control** program found a fault in one of the electronic components or the controller is not running.
Action:	Report the fault to the maintenance department.

S-304: SCU : No connection.	
Cause:	A communication error occurred between the PC and the electronics drive controller: • No serial connection with the PC. • The power or plug is disconnected. • The drive controller is defective.
Action:	Make certain all cables are connected to the PC and the 230V plug. Report the fault to the maintenance department.

S-350: Manual control active.	
Cause:	The manual control in the **Expert** screen is active and has not been released.
Action:	Click the **Release All** button on the **Expert** screen.

S-360: Stopped by operator.	
Cause:	During an active program, the **Stop**  button was pressed.
Action:	The message is automatically stored in the run report.

WARNING ERRORS

W-701: SCU: No connection.	
Cause:	A communication error occurred between the PC and the electronics drive controller: • No serial connection with the PC. • The power or plug is disconnected. • The drive controller is defective.
Action:	Make certain all cables are connected to the PC and the 230V plug. Report the fault to the maintenance department.

W-702: SCU: Wrong configuration.	
Cause:	The **Safety Control** program found a fault in one of the electronic components, or the controller is not in the run.
Action:	Report the fault with number to the maintenance department.

W-703: SCU: Incorrect status and lid inactive.	
Cause:	The **Safety Control** program rejected the previous run and blocked the cover. The LED is red. The cover remains closed under the following conditions: • An error occurred during a **Recovery** program. • There was a power outage. • There is a software error. • The **LIO** program shut down. • There is an electronics error.
Action:	The maintenance department can access the **Expert** service to shut down the process in order to make a repair. • Run the disinfection program to a safe situation by starting a **Recovery** program. • Press the **Start** button. • Press the **Menu** button. • Select your operator ID. • Select the program **Recovery** after aborted program. • Press the **Start** button. • If this program is ready, then the cover can be opened to safely remove the endoscope. After opening the cover, the message disappears and the red LED goes off. The status message “ASC (rejection)” is applicable to the program. The instrument status “not appropriate for use” is applicable to the endoscope.

W-704: SCU: Incorrect status.	
Cause:	The **Safety Control** program rejected the run and the LED is red.
Action:	Open the cover so the message disappears and the red LED goes out. This takes 4 seconds. The control program is now on stand-by.

W-705: SCU: In “OK” status.	
Cause:	SCU status is OK.
Action:	None.

W-711: Lid open.	
This message appears if no disinfection program is active and the cover sensor is on. No disinfection program can be started.	
Cause 1:	The cover is open.
Action:	Press the **Open/Close** button and then the **Start** button.
Cause 2:	There is a cover sensor defect, causing the message to appear even though the cover is closed.
Action:	Report the situation to the maintenance department for repairs.

W-712: Lid will not open.	
Action:	Try to open the cover by pressing the **Start** button.
Cause 1:	The air pressure is too low to open the cover.
Action:	Open the front cover and check the pressure gauges. Report any unusual readings to instrument service.
Cause 2:	The cover is blocked.
Action:	See if the blocking can be noticed visually, also on the rear side, and try if possible to remove this. If this does not work: report problem to the maintenance department.
Cause 3:	A problem control valve is causing the cover cylinder to malfunction.
Action:	Report the situation to the maintenance department.
Cause 4:	The **Open/Close** button was pressed down too long.
Action:	Press the button again but for a shorter time.

W-713: Lid will not close.	
Action:	Press the **Start** button to close the cover or close the cover carefully by hand and test to see if it moves.
Cause 1:	The cover is blocked.
Action:	See if the blockage can be seen and attempt to remove it if possible. If no blockage can be seen, report the problem to the maintenance department.
Cause 2:	The cover sensor is defective or out of alignment.
Action:	Consult the maintenance department.
Cause 3:	The **Open/Close** button was pressed down too long.
Action:	Press the button again but for a shorter time.
Cause 4:	There is a defective air valve or the compressed air pressure is too low to open the cover.
Action:	Report the situation to the maintenance department.

W-715: Basin not empty.	
Cause 1:	The program was aborted and there is still fluid in the basin.
Action:	Open the cover to shut down the program and automatically drain the basin.
Cause 2:	There is liquid in the basin because the drain is blocked or the valve is defective.
Action:	Check if the drain is used and report the problem to the maintenance department.
Cause 3:	There is no liquid in the rinse basin. There is a basin sensor defect.
Action:	Report the problem to the maintenance department.

W-716: Fluid leak detected.	
Cause 1:	Liquid was spilled while changing a reservoir.
Action:	Remove the liquid and dry the sensor (the green plug) carefully. Resetting the sensor can take a few minutes.
Cause 2:	While in stand-by, liquid is detected at the bottom of the machine. Possible causes are leaking or a sensor set at the wrong level.
Action:	Report the situation to the maintenance department.

W-721: Water temperature sensor defective.	
Cause:	There is a temperature sensor defect if the reading is >100°C.
Action:	Report the problem to the maintenance department.

W-743: Sensor S03 Detergent high.	
Cause:	A sensor is out of alignment or the detergent dosage system is clogged.
Action:	Report the warning to the maintenance department.

W-744: Sensor S17 : Minimum level high.	
Cause:	There is water in the rinse basin or a sensor defect.
Action:	Close the cover to allow the basin to run empty. Report the warning to the maintenance department.

W-749: Sensor S24 : Alcohol high.	
Cause:	A sensor is out of alignment or the alcohol dosage system is clogged.
Action:	Report the warning to the maintenance department.

W-751: Sensor S11 : Leak test #1 high.	
Cause:	Disinfection cycle fails or the user pushed the **Cancel** ⊗ button to end the cycle.
Action:	Open the basin lid and disconnect the channel block from the channel manifold. The pressure should now be released and the warning message should disappear. Reinstall the channel block, close the basin lid, and a new cycle can now be initiated.

W-753: Sensor S25 high.	
Cause:	The part A dosing reservoir fill sensor is out of alignment or faulty.
Action:	Report the warning to the maintenance department.

W-754: Sensor S26 high.	
Cause:	The part A dosing reservoir fill sensor is out of alignment or faulty.
Action:	Report the warning to the maintenance department.

W-757: Sensor S33 high.	
This message appears if not disinfection program is active. The warning must be cleared before a program is restarted.	
Cause:	The air cylinder sensor is out of alignment or faulty.
Action:	Report the error to Maintenance.

W-764, W-765, W-766, W-767, W-768, W-769, W-770: Sensor high.	
This message appears when the machine is in stand-by and one of the channel sensors is high. This report occurs for the following channels. • Air • Biopsy • Elevator Wire • Extra • Jet • Suction • Water	
Cause 1:	The connection block is obstructed and the endoscope is not connected.
Action:	Disengage the block. If the message disappears, report the obstructed block to the maintenance department. If the message remains see the next possible cause.
Cause 2:	There is a channel sensor defect.
Action:	Report the defective sensor to the maintenance department.

W-800: Manual control active.	
Cause:	One or more functions are manually set. This means a disinfection program can not be started.
Action:	Contact the maintenance department with a request to cancel the setting.

W-801: Purge in progress.	
Cause:	This message appears when the machine is in stand-by and the machine leak test system is blown through. This is an automatic routine that occurs every hour and lasts one minute.
Action:	Wait until the message disappears and start the program.

W-802: Venting alcohol line, close lid.	
Cause:	Alcohol lines are pressurized while unit is idle.
Action:	Wait until venting process completes, then start cycle.

W-803: Discharging air cylinder, close lid.	
Cause:	Air cylinder is pressurized while unit is idle.
Action:	Wait until venting process completes, then start cycle.

W-805: Left side controls the water line disinfect.	
Cause:	Right side cannot control the water line disinfect cycle.
Action:	Use left side control panel to control water line disinfect cycle.

W-810: Open lid to complete cycle.	
Cause:	The program is finished. This report indicates how the program needs to be shut down.
Action:	Press the **Open/Close** button and follow the instructions on the screen. After selecting the correct operator ID, the cover opens automatically and the program shuts down.

W-820: Disinfectant in the basin (lid locked).	
Cause:	The water line disinfect cycle failed while disinfectant was in the basin.
Action:	Restart the water line disinfect cycle.

W-821: Disinfectant in supply line (lid locked).	
Cause:	The water line disinfect cycle failed while disinfectant was in the water supply lines.
Action:	Restart the water line disinfect cycle.

CHAPTER 6

SYSTEM ADMINISTRATION

This chapter is meant for Administrative Use Only. It shows the System Administrator how to setup and manage all process-specific data, along with the daily operations of the ADVANTAGE PLUS™ Reprocessor machines, server and programs. The System Administrator must have a strong background in PC computers and Windows Operating Software. If you are uncertain of how to proceed, contact your Hospital Data Center or call Technical Support for assistance.

ADVANTAGE PLUS™ REPROCESSOR SOFTWARE

The ADVANTAGE PLUS™ Reprocessor software consists of three main programs:

1. **LIO (Logic Input/Output)** is the program operators use to communicate with the ADVANTAGE PLUS Reprocessor. The software also controls the ADVANTAGE PLUS Reprocessor and the disinfection processes. This program runs on every computer with the ADVANTAGE PLUS Reprocessor connected.
2. **Management** is the ADVANTAGE PLUS Reprocessor database for user and cycle run information. The system administrator has access to input data, process reports, and manage multiple ADVANTAGE PLUS Reprocessors. This program runs on only one computer, usually a server of the ADVANTAGE PLUS Reprocessor.

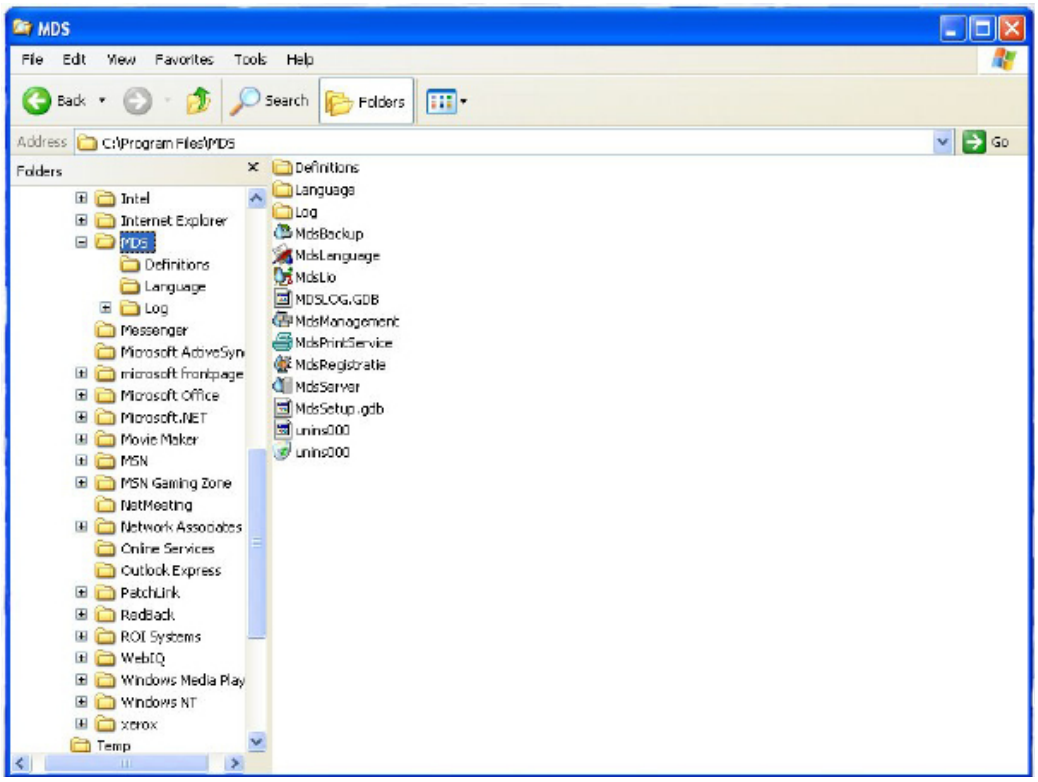


Figure 1 ADVANTAGE PLUS™ Reprocessor Directory Structure

Hospital Administrator Login

The ADVANTAGE PLUS™ Reprocessor database can only be accessed using a Hospital Administrator account. A Hospital Administrator account is created during ADVANTAGE PLUS Reprocessor installation. A Hospital Administrator can add and update:

- Users
- Physicians/Assistants
- Instruments
- Modify and create parameter sets
- Modify non-critical system parameters
- Launch the **Server** program if it is not already running.

To login as a Hospital Administrator:

1. Launch the **Server** program if it is not already running.
2. Launch the **Management** program by going to Start > All Programs > MDS > Management, or by double-clicking on the **Management** shortcut in the ADVANTAGE PLUS Reprocessor folder on the computer desktop.
3. When the authorization window appears, click on the down arrow to select your login name.

Figure 2 Authorization Window

4. Enter your numeric password. Press the **CLR** button if you make an entry error and want to re-enter the password. Press the **Cancel** button to close the **Management** program without creating your password. Press the **OK** button to complete your password entry and continue on to the **Management** program.

Note: To prevent unauthorized access to the Management program, close the program when you have finished your work.

Under special circumstances, a temporary password can be issued to login as a System Administrator. Contact technical service to describe the problem. If you receive a password, it will be valid only for the date it was granted and only for specific applications.

MANAGEMENT PROGRAM

Structure

The **Management** program is subdivided into general and configuration applications. These are available as links on the **Management** screen.

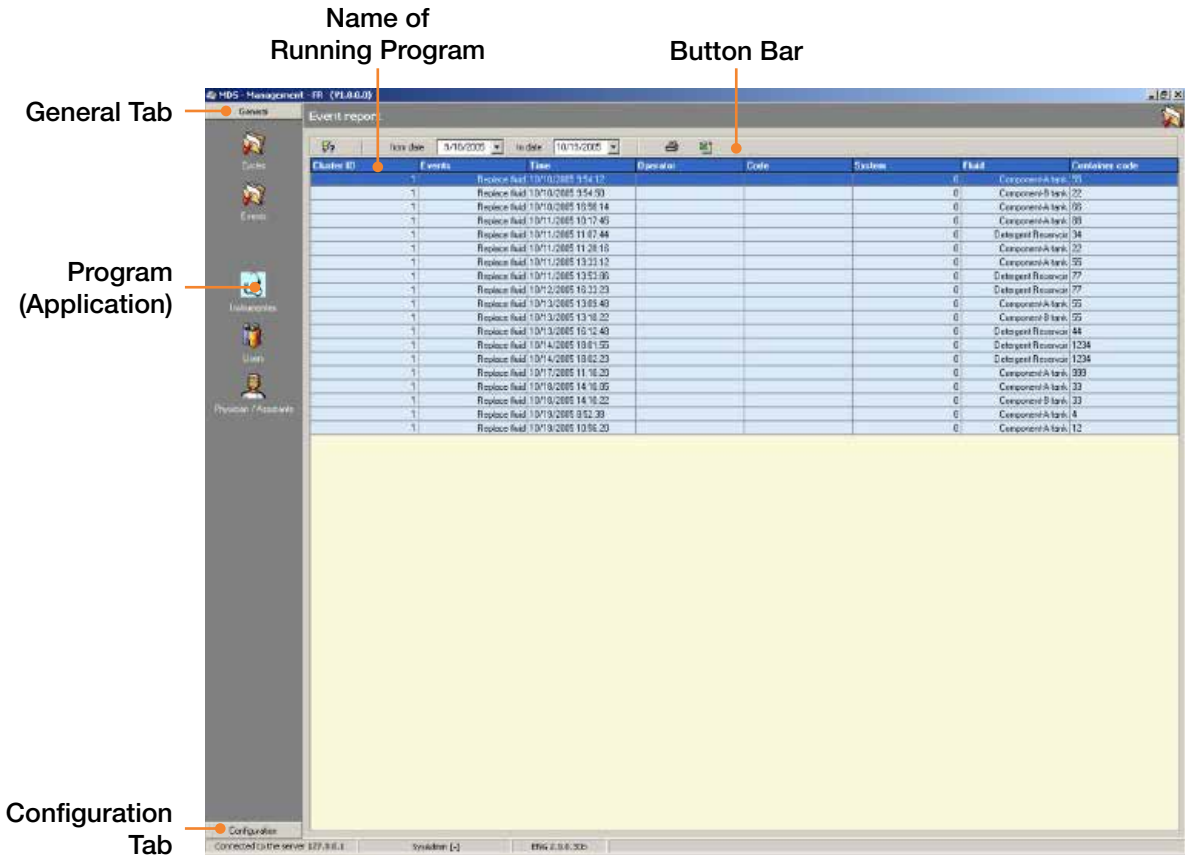


Figure 3 Management Screen

General Applications

There are five general applications:

1. **Cycles** collects information from the disinfection programs. Specific data can be called up from the database with the sort and search options.
2. **Events** gathers data from non-program activities, such as fluid changes.
3. **Instruments** maintains data relating to instruments and endoscopes.
4. **Users** stores data on ADVANTAGE PLUS™ Reprocessor operators and other authorized personnel who may work with the ADVANTAGE PLUS Reprocessor or any peripheral hardware or software.
5. **Physician/Assistants** is a database used to identify physicians and other medical personnel who use endoscopes for patient examinations.

Configuration Applications

There are two configuration applications:

1. **Programs** provides an overview of the programs and the relevant settings.
2. **Systems** is where all machine settings are entered. These settings are mostly for maintenance and calibration.

Setup

The **Management** software is delivered with many base settings already established. However, before the ADVANTAGE PLUS™ Reprocessor can be released for use, the hospital administrator or service technician must enter customer-specific data for the following:

- Instruments (if different from those already in the base settings)
- Users
- Physicians/Assistants

Network availability of the ADVANTAGE PLUS Reprocessor **Management** program is the responsibility of the hospital data center. The hospital administrator is the one who enters user login names, access options, and access rights. You also set the passwords which are distributed to other users. It is your responsibility to keep the passwords confidential to protect the data and to meet all legal obligations. Forms are provided so that you can collect all the necessary information if the data is not available at a single location.

The following sections provide detailed instructions to assist you in entering data specific for your facility.

Note: File the forms in a safe location so that you maintain a record of the passwords that you assign. There is no other method available to retrieve passwords.

Navigation

The name of a button usually appears if you mouse over it. Information on the function of buttons unique to the program is described below. Buttons with a commonly understood function, such as **Save** are not covered.

Select: Press the arrow at the top right of a list to selection from a drop-down list.

Sort: Sort the information in any column by pressing the arrow at the top right of the column. By pressing the arrow again, the sequence is reversed. For example, sort alphabetically A to Z, or Z to A.

Export: Send a copy of the data to a CD or other external media.

Import: Retrieve stored data from another location.

Printing

To print specific lists from various applications, press the **Print** button. Properties and settings are specific for your printer. See your printer user manual for additional information.

Data Management

CAUTION: Importing or modifying data may result in its loss. Backup your data regularly and verify that only one Management application is active when data is modified.

Backups

All data should be backed up on a regular basis. Follow the procedures established by your facility for scheduling and storing backups.

ADVANTAGE PLUS™ Reprocessor data is stored on the PC hard drive. Backups may be saved to a CD, diskette, memory stick, or an external server: Depending on the application, backups are created by the following steps:

1. Click the **Save** or **Save As** button.
2. Copy the file(s) to the desired location via Windows Explorer.

Importing Data

Only ADVANTAGE PLUS Reprocessor-specific files such as program parameter sets, endoscope codes, and user information can be imported. Two file formats are available:

- XLS = Microsoft Excel files
- TXT = Comma Separated Values (CSV) text files

1. Click on the **Import Data** button.
2. When the **Import Data Wizard** screen appears, select the file format of the original application. For example, to reset the edited list, the original destination file should be given as source file:
   - For Excel: Data file-1-MDS.xls
   - For Word: Data file–1-MDS.txt
3. If the system parameters have changed, all **LIO** applications must be restarted.

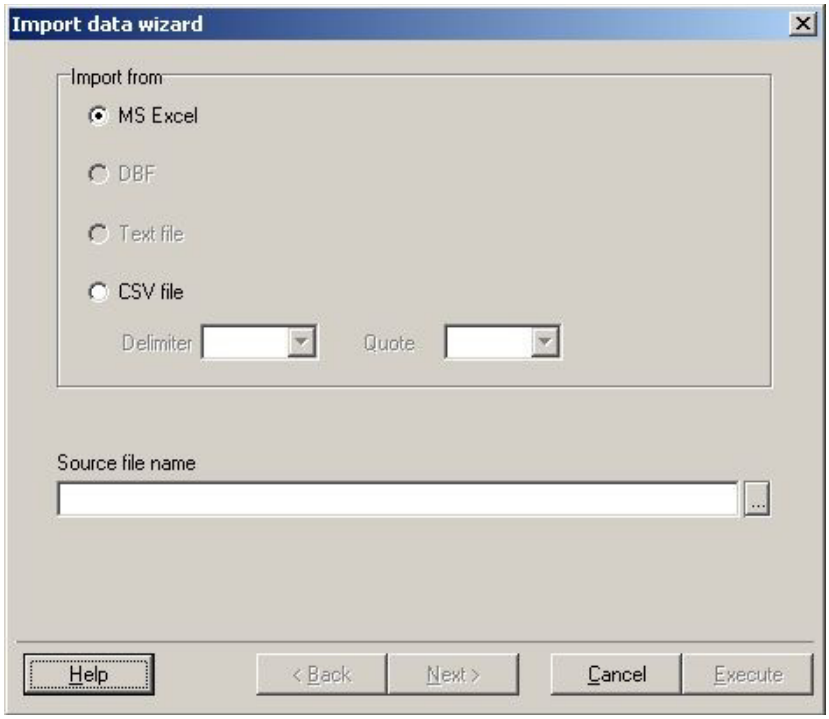


Figure 4 Import Data Wizard

Exporting Data

Data can be exported only if the **Export Data** button is present in the button bar.

1. Click the **Export Data** button so the **Export Dialog** screen appears.
2. Using the menu, select the formats appropriate for the application (program) to which the file will be transferred. The file name is entered in the input line under Destination File. For example, to process a data file which may be re-imported later, the file name can be used as the destination file name:
   - For Excel: Data file-1-MDS.xls
   - For Word: Data file–1-MDS.txt

Figure 5 Export Dialog Window

Barcodes

The ADVANTAGE PLUS™ Reprocessor is supplied with a set of barcode labels to be used with the endoscopes, operators, physicians and assistants.

The barcode label mounted on the endoscope should be placed on the control head handle on the knob side so the barcode is visible when endoscope is place in the basin. Before the barcode label is attached to the endoscope clean the surface of the endoscope with alcohol and dry.

The barcode label for the operator can be placed on the operator's ID badge or on the barcode scanner shelf mounted on the right side of the ADVANTAGE PLUS Reprocessor.

The supplied set is numbered 100 to 199 and includes 2 barcode labels per number. Duplicate barcode labels can be ordered with part number 67199-157. A barcode label set number 200-299 can be ordered with part number 67199-158.

ENDOSCOPE REGISTRATION

Categorizing Endoscopes

WARNING: INCORRECTLY CATEGORIZING AN ENDOSCOPE MAY RESULT IN INCOMPLETE DISINFECTION. IF YOU HAVE QUESTIONS ABOUT AN ENDOSCOPE, CONTACT THE ENDOSCOPE MANUFACTURER OR TECHNICAL SERVICE FOR ADVICE.

The ADVANTAGE PLUS™ Reprocessor has different programs for different types of endoscopes. The objective is to monitor only those channels that are connected, preventing the generation of incorrect failure messages. Each endoscope requires a specific connector block and a specific parameter set. Reference the Endoscope Hookup guide to identify the endoscope that you are using and the appropriate connector block and parameter set to use. Failure to sue the correct connector block and parameter set can result in an endoscope that is not disinfected properly and therefore should not be used on a patient. If you are uncertain about the correct channel setup of an endoscope, call technical support for assistance.

Entering Data

WARNING: ENDOSCOPE CODES ARE UNIQUE, AND CAN BE ASSIGNED ONCE ONLY. IF A SINGLE ENDOSCOPE MUST BE REGISTERED UNDER TWO DIFFERENT PROGRAMS, THEN IT MUST BE DONE UNDER DIFFERENT CODES.

Data Fields

Endoscopes can be registered as single units or defined sets. The following data is entered:

- **Code** is a short ID number used for quick recognition. It is applied to the control head.
- **Endoscope Type** provides a reference to a defined parameter set.
- **Connection Block** is the part number for the connection block.
- **Brand** is the name of the endoscope manufacturer.
- **Barcode (optional)** is the human-readable information in the endoscope barcode.
- **Type Number** is the model of endoscope.
- **Serial Number** is the manufacturer-assigned identification number on the endoscope.
- **Internal ID** is the hospital identification number for the endoscope. The internal ID is printed on the cycle log.
- **Memo** is a field where extra information can be entered as text.

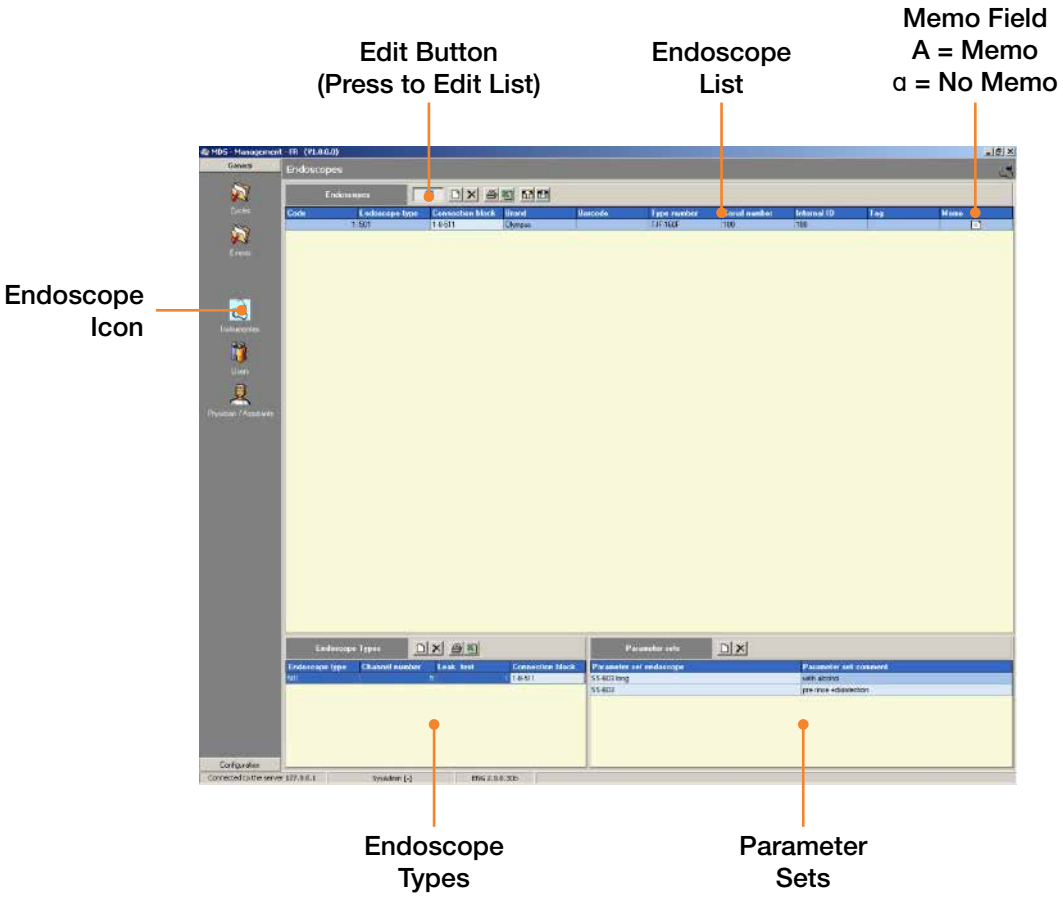


Figure 6 Endoscope Fields

Adding Endoscope Types

Before entering data for specific endoscopes, the endoscope types must be entered:

1. Click on the **Edit** icon to enable editing.
2. Click on the **New** button at the top of the **Endoscopes Type** window at the lower left of the screen. An empty input line appears.
3. Place the cursor in the **Endoscope Type** field and enter the appropriate data.
4. Move the cursor to the next field and continue entering data in all applicable fields.
5. Click on the **Edit** icon to disable editing.

Note: There is no Save button. Data is saved only if you click or move the cursor to another field in the list.

Adding Parameter Sets

Different types of endoscopes can be linked to a parameter set in the disinfection program. A standard disinfection program is then provided. These are the most common types of endoscopes:

- Bronchoscope
- Colonoscope
- Cystoscope
- Duodenoscope
- Gastroscope

Reference the *Hookup Application Guide* for the applicable hookup part number and parameter set.

Additional parameter sets may be required upon acquiring new or additional endoscopes.

To add a new parameter copy the parameter set to the program Files/MDS/Import folder. Open the **Management** program using the shortcut in the ADVANTAGE PLUS™ Reprocessor folder on the desktop. Select the configuration tab and select programs. Click on the **Import** icon  . Select the parameter set from the **Open Dialog Box**.

Adding a New Endoscope

Information for a new endoscope is entered as follows:

1. Click on **Edit** icon  to enable editing.
2. Click on the **New**  button at the top of the Endoscope field. An empty input line appears.
3. Place the cursor in the Code field and enter the data.
4. Move the cursor to the next field. Click on the arrow on the right side to select the appropriate endoscope type.
5. Continue entering data in all applicable fields.
6. If you wish to add a memo, click on the arrow key to open a small notepad. Type in your memo and click the **OK** button to save.
7. Click on the **Edit** icon  to disable editing.

Endoscope Replacement

If an endoscope is replaced by a new one, data traceability may be lost. There are two solutions:

1. Consecutively number the endoscope codes. Although the old endoscope is no longer used, the code and data remain stored in the system.
2. Create a Memo report. The information for the replaced endoscope is noted in the memo field along with the replacement date.

New endoscope data are entered via the endoscope registration.

Editing Data

To change any information already entered, do the following:

1. Click on the **Edit** icon  .
2. Click on the field to be modified and enter the new information.
3. Select another field to save the data.
4. Click on the **Edit** icon  to disable editing.

Deleting Data

To completely remove an endoscope and all the information entered for it, follow these steps:

1. Click on the **Edit** icon  to enable editing.
2. Click on the line to be deleted in the overview list.
3. Click on the **Delete** button.
4. A window opens asking for confirmation. Click **OK** to delete the information. Click **Cancel** to go back without deleting any data.
5. Click on the **Edit** icon  to disable editing.

USER (OPERATOR) REGISTRATION

Users/Operators

Users are the people who have access to the system data and operate the ADVANTAGE PLUS™ Reprocessor machine. For security and data protection, operator access is limited to specific programs and functions.

For each operator the following data can be entered:

- Name
- Login
- Group
- Barcode
- Tag
- Personal Code or Employee Number
- Password

Note: Passwords consist of numbers only.

User Groups

User groups are set up to establish access rights for different types of operators. A user may actually operate the ADVANTAGE PLUS Reprocessor to disinfect endoscopes, or may use the data stored. The following groups are standard:

- Hospital operator = Daily operator
- Hospital maintenance = Hospital technicians and maintenance
- Hospital Administrator = System manager able to add to and update ADVANTAGE PLUS Reprocessor database
- Supplier R&D = Supplier system management
- Supplier maintenance = Field technician
- Supplier production = Manufacturer production personnel

The software is supplied with a number of base settings for these groups. They can be changed by the system administrator and new groups may be added.

Entering Data

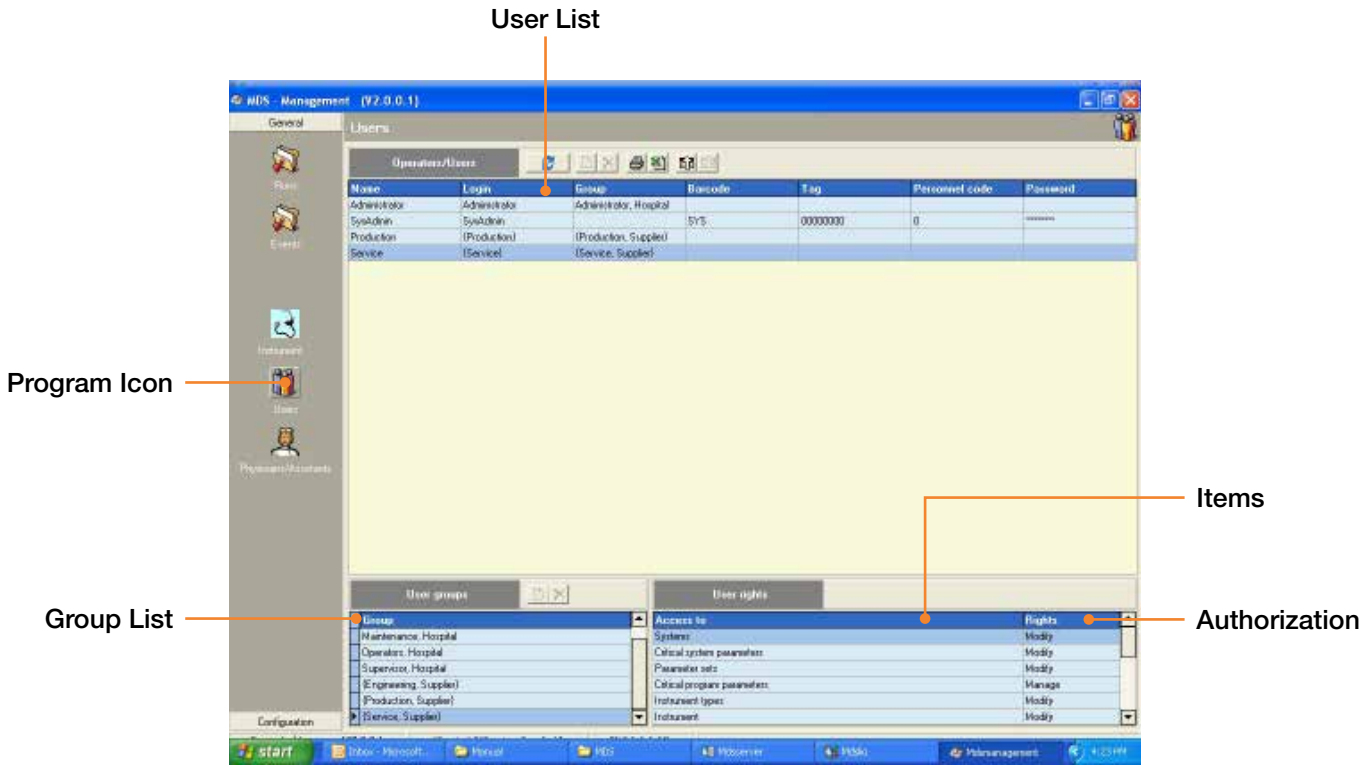


Figure 7 Users Screen

Adding a New User

To add a new user, follow these steps:

1. Click on the **Edit** icon to enable editing.
2. Click on the **Add** button to add an empty record at the top of the list.
3. Position the cursor in the first field and enter the appropriate information.
4. Name: Complete user name.
5. Login: Login in name.
6. Group: Select the appropriate group for this user.
7. Tag: Barcode number for identification system.
8. Personal Code: Employee number, barcode number, or other ID.
9. Password: Personal access code.
10. Click on another line to save the data.
11. When completed, click on the **Edit** icon to disable editing.

Changing User Data

To modify user data, follow these steps:

1. Click on the **Edit** icon  to enable editing.
2. Select the field to be changed and enter the new information.
3. Click on another line to save the data.
4. Click on the **Edit** icon  to disable editing.

Deleting User Data

To delete a user profile, follow these steps:

1. Click on the **Edit** icon  to enable editing.
2. Select the line to be deleted in the overview list.
3. Click on the **Delete** button.
4. When a confirmation window opens, click **OK** to delete the user, or click **Cancel** to go back without deleting the information.
5. Click on the **Edit** icon  to disable editing.

PHYSICIAN/ASSISTANTS REGISTRATION

General Information

Under Doctors are listed the people who have a connection to the patient and endoscope, but who are not actively involved in the disinfection process. Because they do not operate the ADVANTAGE PLUS™ Reprocessor, they have no user rights on the system.

For the doctor or assistant the following data can be entered:

- Internal ID such as employee number
- Name
- Barcode
- Type (Physician or Assistant)

Note: If an ADVANTAGE PLUS™ Reprocessor operator assists in a patient examination, then the operator's name must be registered as an operator and as an assistant.

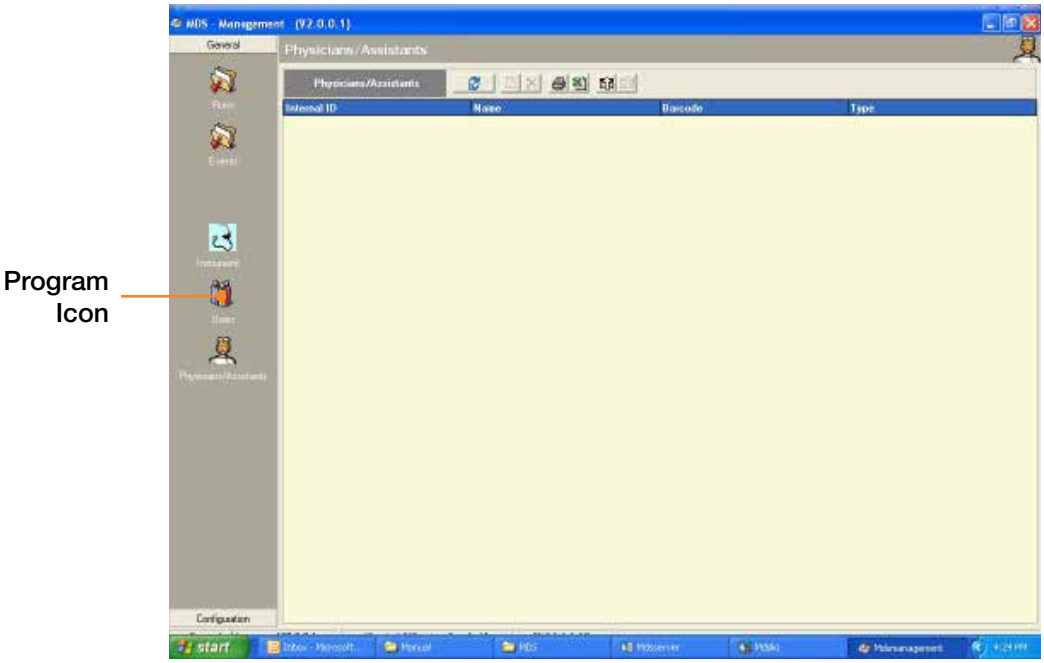


Figure 8 Physician and Assistant Window

Adding Physician Information

Doctor and Assistant information is entered by doing the following:

1. Click on the **Physician/Assistants** icon on the left side of the screen.
2. Click on the **Edit** icon  at the top of the window if editing is turned off.
3. Click on the **New**  button at the top of the window. A new, empty input line appears.
4. Place the cursor in the Internal ID field and enter the appropriate information.
5. Continue to enter data in the fields.
6. In the Type field, click on the arrow mark and select **Specialist** (physician) or **Assistant** (other medical personnel present at the patient examination).

Changing Physician Information

To change existing information, do the following:

1. Click on the field to be modified and enter the new information.
2. Press **Enter** to save the data.

Deleting Physician Information

To completely delete a physician ID, follow these steps:

1. Select the line to be deleted and press the **Delete** button.
2. When a confirmation window opens, press **OK** to delete the information or **Cancel** to go back without deleting.

REPORTS

Introduction

By clicking on the **Runs** icon on the left side of the **Management General** window, program data can be called up. The information is based on the cycles run and data entered.

If the database is large, searching specific items may be time consuming. Non-applicable criteria can be excluded. A selection can be made from:

- Date or time period
- Machine number
- Operator
- Patient
- Program level

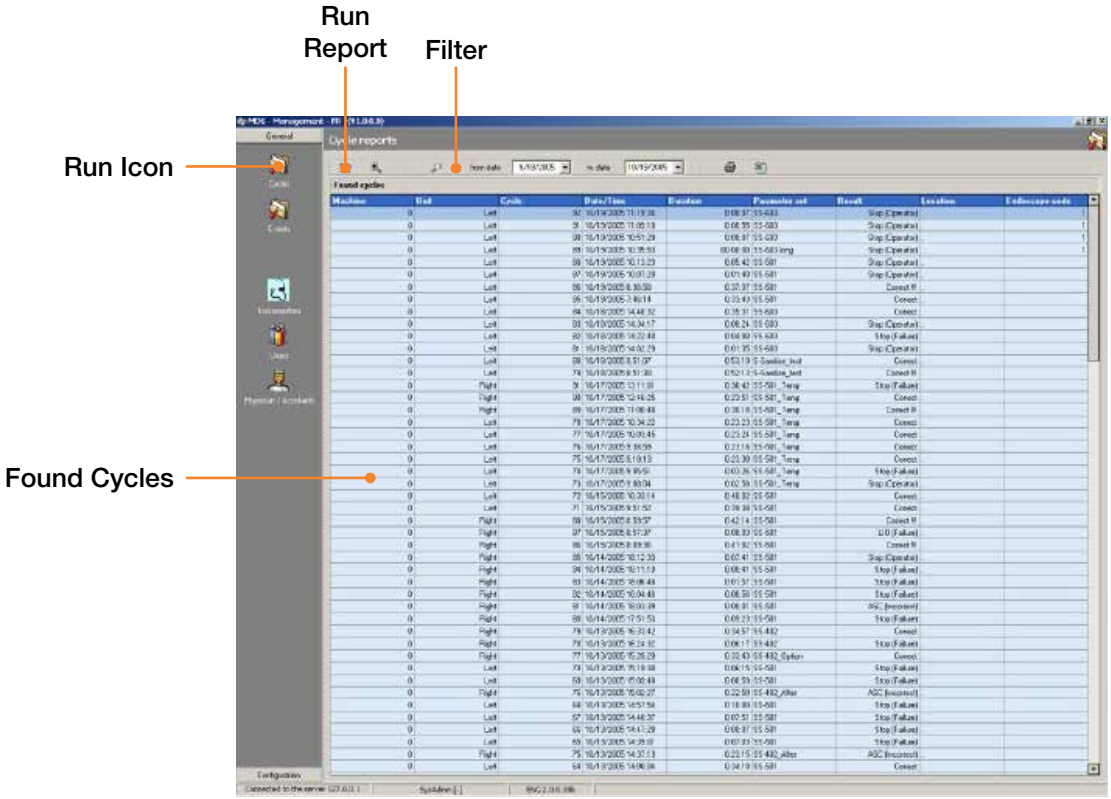


Figure 9 Report Screen

Selecting Report Criteria

Time Period Selection

1. Narrow down your search criteria by gathering data from a specific time period.
2. With buttons **From Date** and **To Date** select the dates for your report.
3. Click on the arrow key to the right of each date window.
4. Select the desired start and end dates from the calendars that pop up.
5. Press the **Run** button to run the report.

Narrow Criteria

1. The overview report is easier to read if it is shorter and more concise. To narrow or filter your search criteria, press the arrow key beside the **Filter** button, and chose the desired selection in the menu.

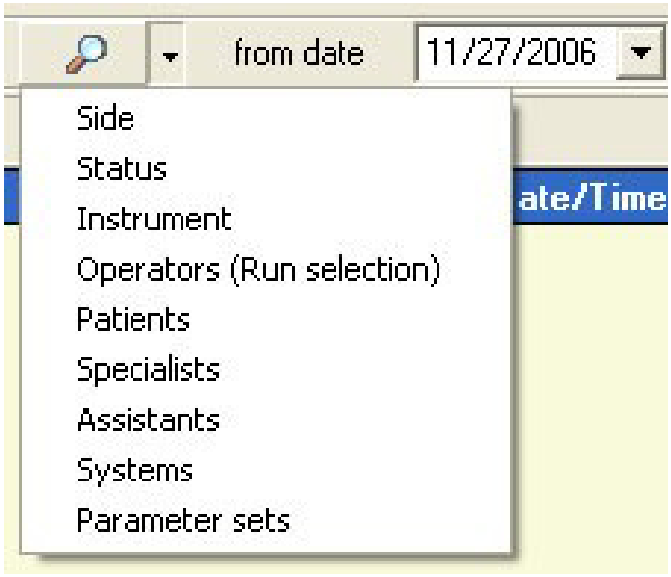


Figure 10 Narrow Criteria

2. In the window that opens, chose the selections which you want displayed.

3. For the status selection, for example, you can choose the following items.

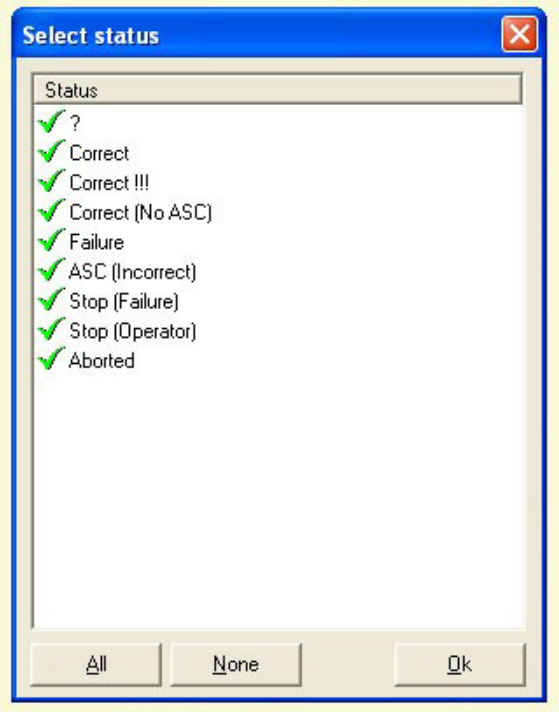


Figure 11 Status Selection

4. Double-click on an item to select it or to cancel the selection.
5. Press **OK** and **Run** to run the report.
6. If a selection is active, then the icon changes to to indicate that a selection has been implemented.
7. A selection can be made from:
   - Assistants
   - Endoscope code
   - Operators
   - Parameters
   - Patients
   - Physicians
   - Run status
   - Systems
   - Left or right side of the ADVANTAGE PLUS™ Reprocessor.

Run Report

By pressing the **Run Report** button, the report overview is set up and the report is shown on the screen.

1. Click on the upper blue bar to sort the list in the appropriate column. Click again to reverse the selection.
2. The data of each run goes horizontally by line.
3. Double-click on a line if more information is desired. The screen run details are displayed.

Run Details

In the Run Details field, a number of columns are included with specific run data.

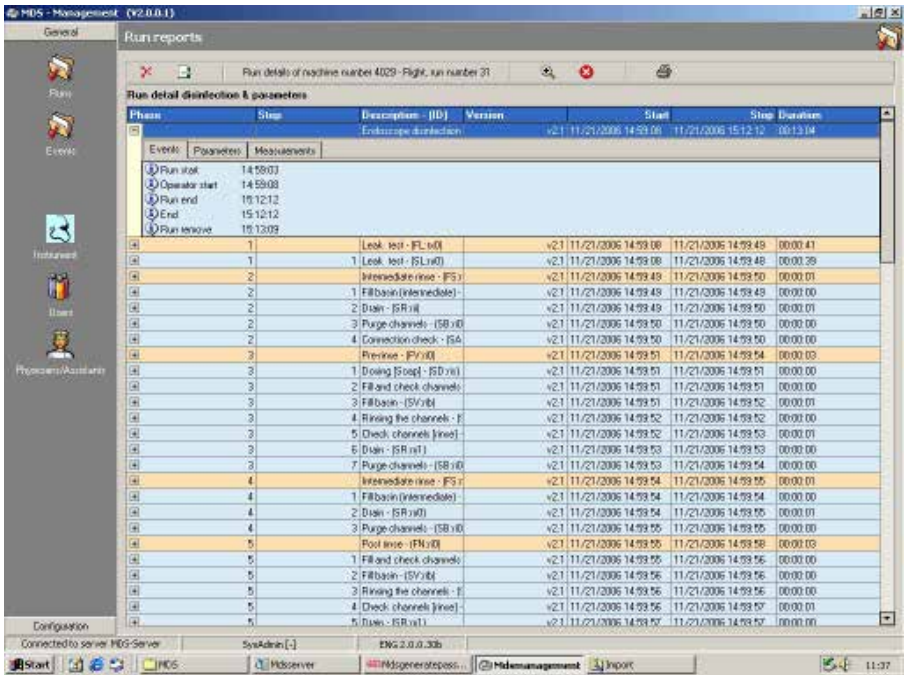


Figure 12 Run Details

- The button displays the details for all steps. While the button minimizes all details.
- Press the **Plus Sign** to the left of each step to see more information, or press the **Minus Sign** to close the step overview.
- Errors are indicated with the symbol.

EVENTS

The **Events** overview is accessed from the icon on the left side of the **Management General** screen.

1. The selected time period is set from the buttons **From Date** and **To Date**.
2. Pressing the **Selection** button retrieves the overview.
3. To simplify the selection, click on any column to sort the data.

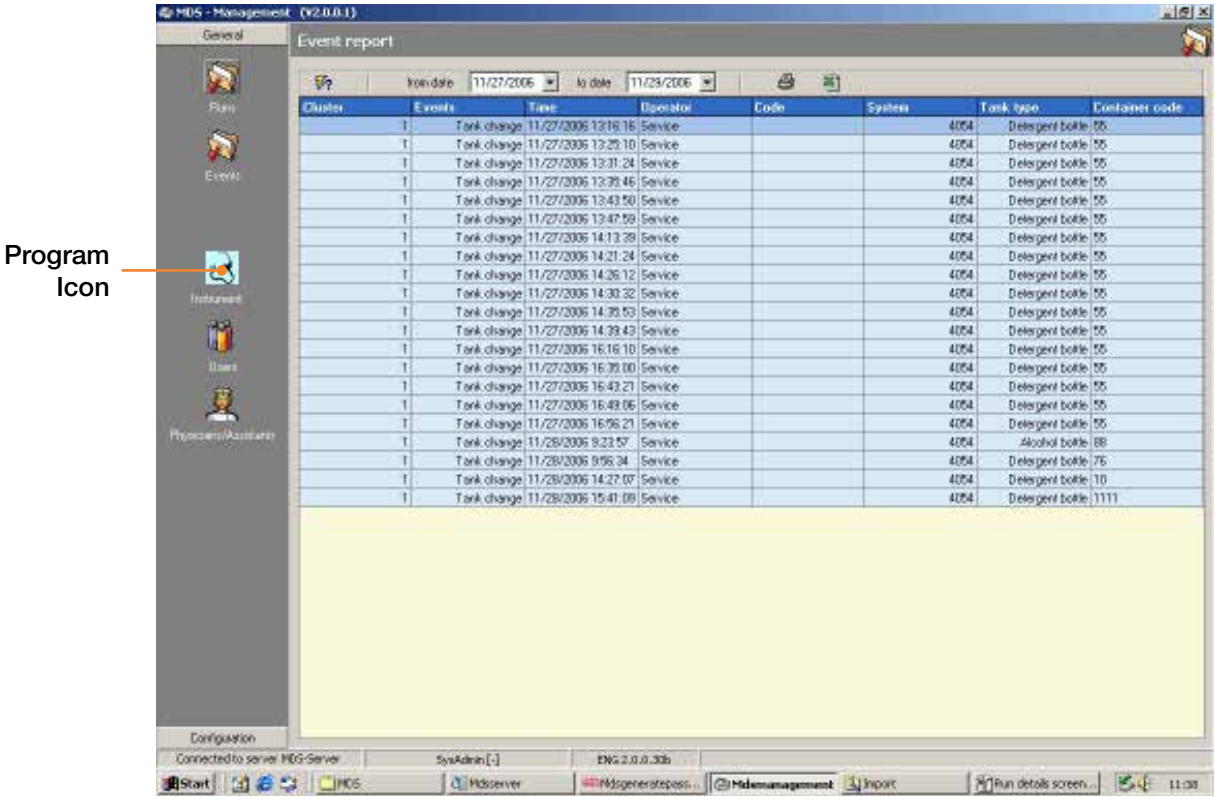


Figure 13 Events Overview

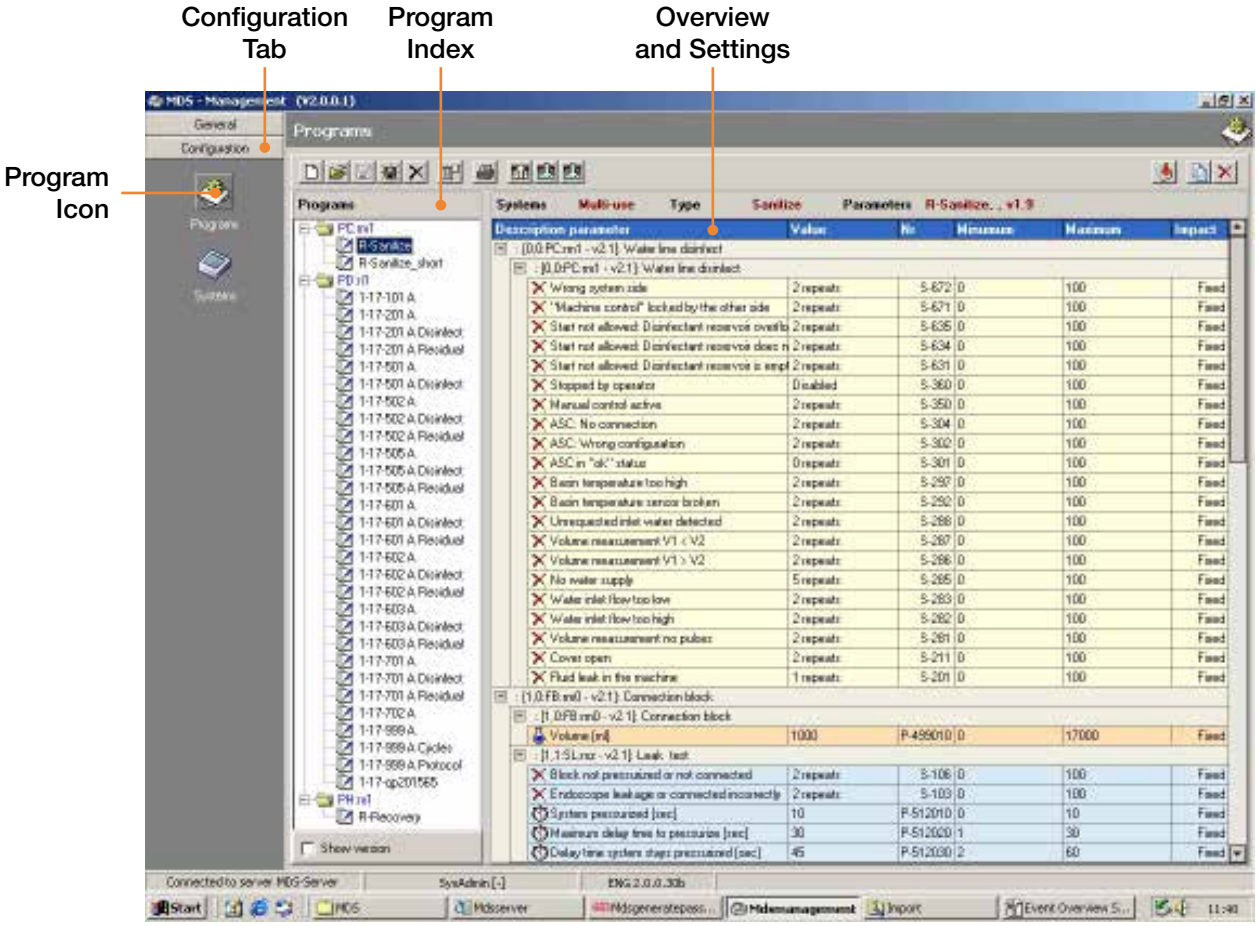


Figure 14 Programs Screen

The **Program** window shows a list of program folders. The folders are labeled with the following codes:

PD Instrument disinfection programs

PH **Recovery** program after an interrupted disinfection

PC Water line disinfect parameter sets

To select a specific program, follow these steps:

1. Click the **Plus Sign** in front of a folder to view the programs inside.
2. Select the program you want by clicking on the name.
3. Click on the **Open File** button.
4. The parameter overview and settings for the program appears in the next window to the right.

SYSTEMS

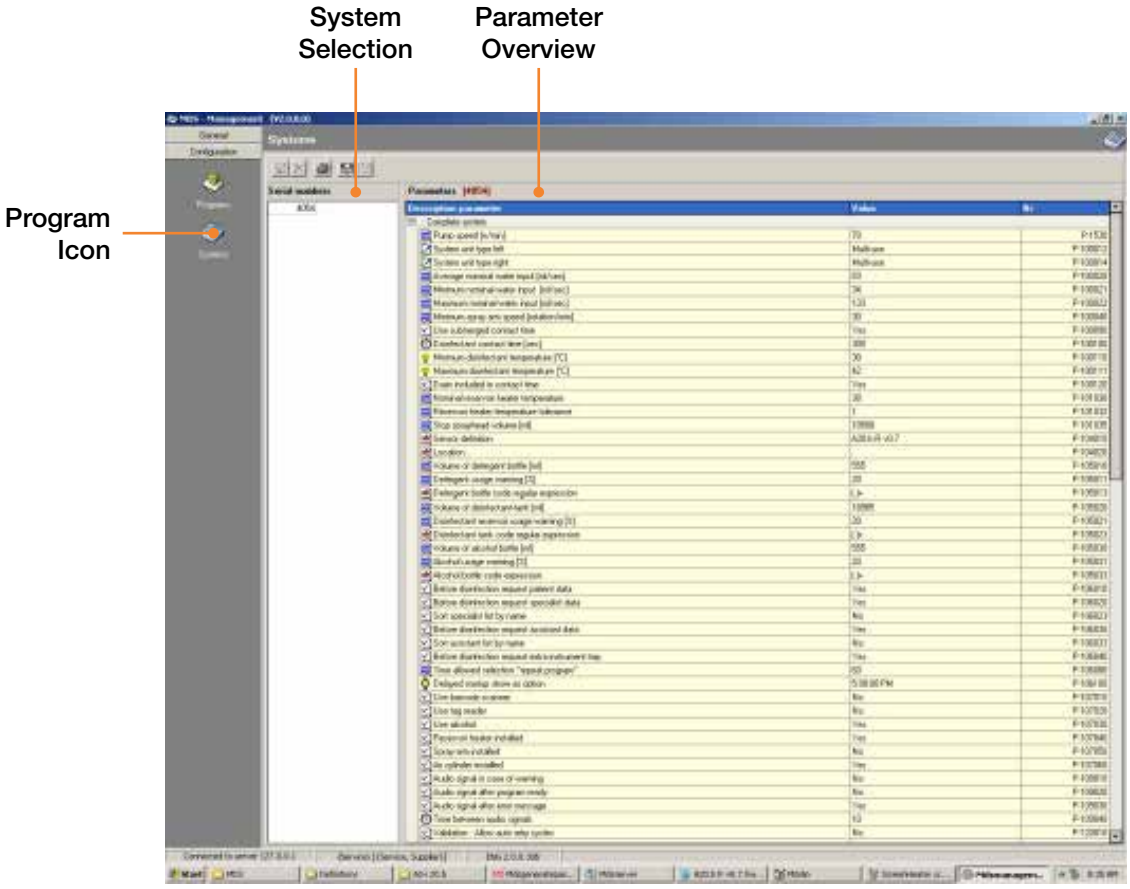


Figure 15 System Window

System settings may be adjusted as desired with the **Server** application. Some settings may require calibration before use.

The **System Overview** gives one or more machine numbers, which via the **Server** application are connected to the central **Management** database.

ADVANTAGE PLUS™ Reprocessor machines are selected by their serial number. This can be found on the name plate inside the front door. To select a machine and its parameters, follow these steps:

1. Select the machine by clicking on the serial number in the **System Overview** window.
2. Click on the **Open** button on the icon bar.
3. The parameter overview appears in the **Parameter Overview** window.
4. A description of each parameter function appears in the tables below.

Table 1 System Parameters

Parameter	Function
For patient disinfection data call-ups	If set to “Yes,” the requirement to enter patient data is activated and appears on the screen.
Specialist/assistant	If set to “Yes,” the requirement to enter physician or assistant data is activated and appears on the screen.
Sort list by name	If set to “Yes,” overviews for physicians and assistants are sorted alphabetically by name in the selection screen. If set to “No,” the overview is sorted by number.
Time allowed for selection (seconds) (Repeat Program)	If a run did not proceed correctly, then the program can be restarted. If this occurs within the time input, then all input data is automatically re-entered, except the operator login and password.
Audio signal	If set to “Yes,” an audible signal sounds for a warning, error, and when the program is done.
Delayed Startup show as option	Set the time when the **Delayed Startup** option will be displayed when setting up a disinfectant cycle to run.

Table 2 Left/Right Parameters

Parameter	Function
Machine program (Monday through Sunday)	Select the day to automatically execute the machine cleaning program.
Machine program (time period)	Start time for the automatic start. Either basin may have a delayed start of up to two hours.
Water Line Disinfect program parameter set	Parameter set to be used when **Water Line Disinfect** program has been scheduled.

LIO EXPERT OPERATION

Introduction

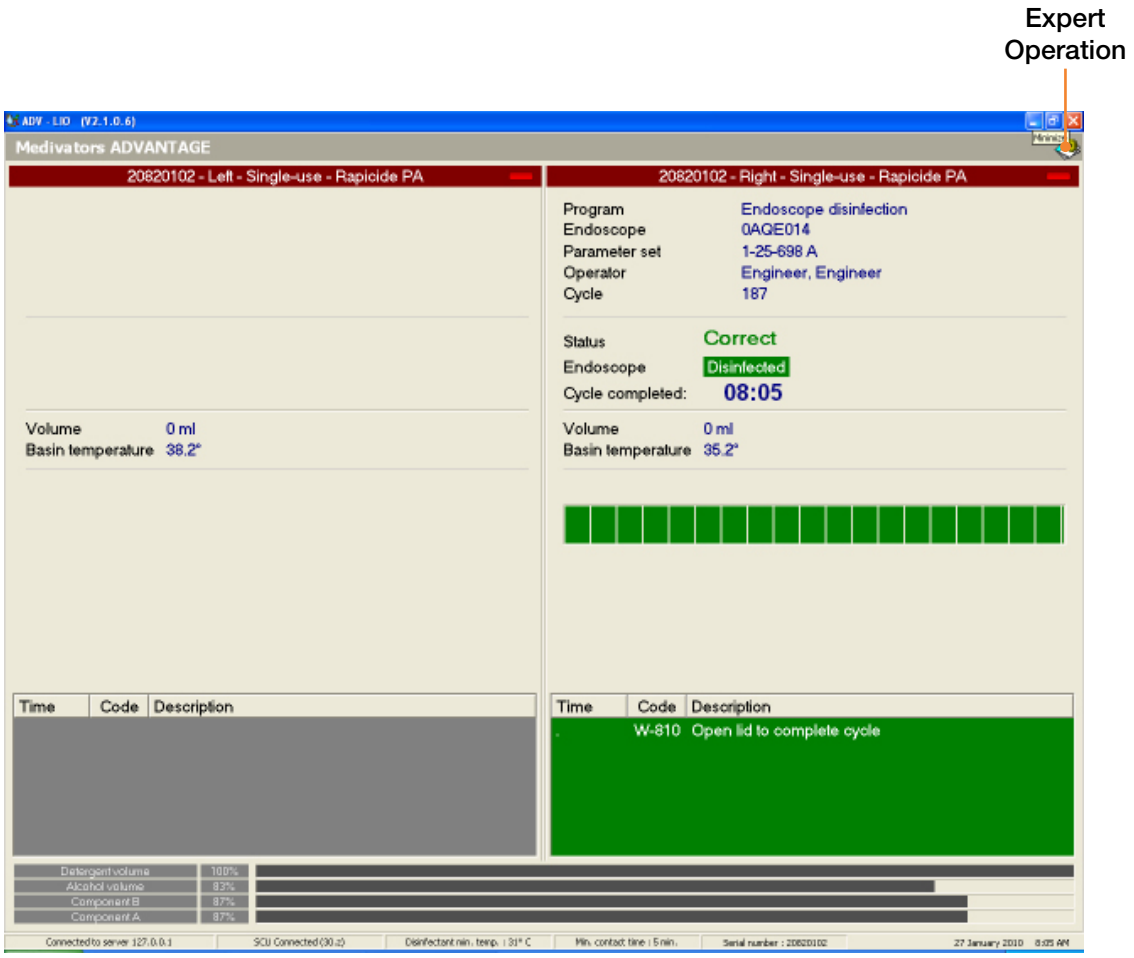


Figure 16 ADVANTAGE PLUS™ Reprocessor LIO Window

Expert Operation is a special application of the **LIO** program. It is used to carry out operations that fall outside the normal use of the ADVANTAGE PLUS™ Reprocessor.

Expert Operation is launched by double-clicking on the icon in the upper right of the window. A login window appears and shows the names of the operators who have access rights to the program.

System

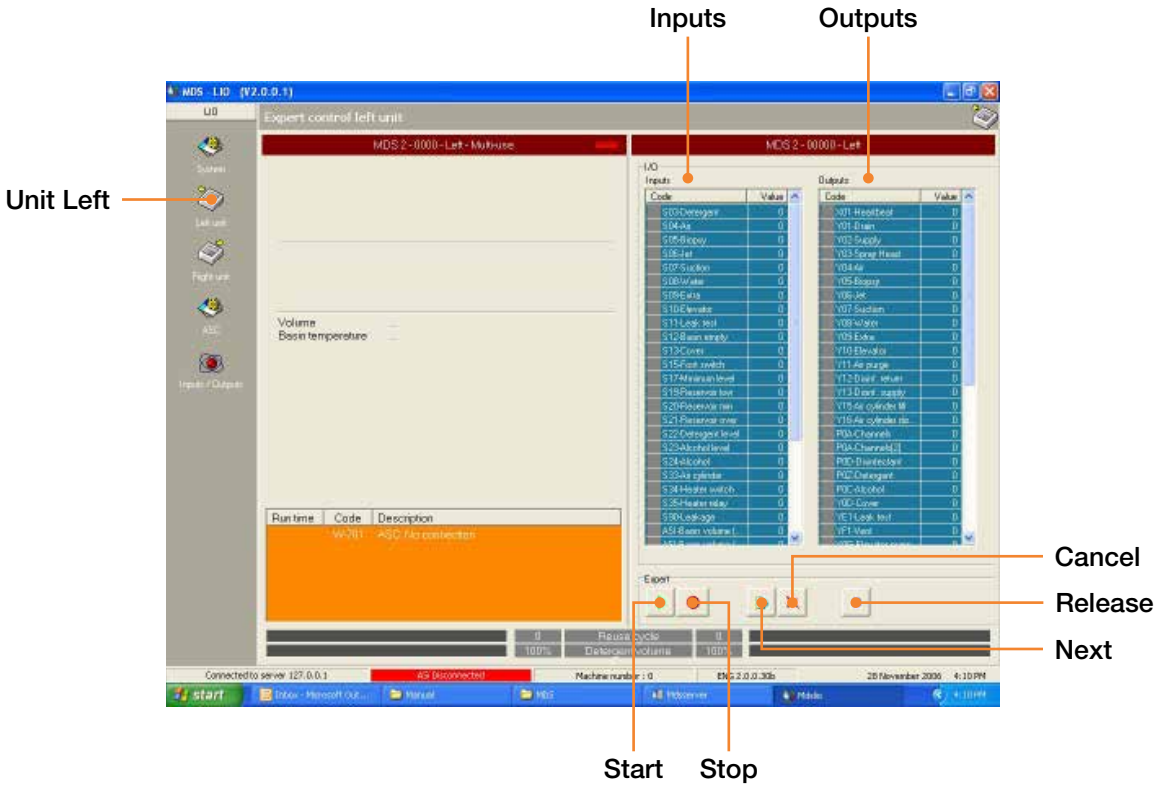


Figure 17 Unit Left Expert Operation

- Selecting either the **Unit Left** or **Unit Right** icons allows that half of the system to be monitored and manually operated:
- If a sensor sends a signal to an input, the indicator turns green.
- Double-clicking on an output allows it to be manually driven. The indicator turns red when the output is activated and report W-800 appears in the status field.
- Pressing the **Start** or **Stop** button affects an already active program. Clicking the **Stop** button sends the program to the final step in the process.
- Pressing the **Next Step** button sends the program to the following step in the process. This is useful when simulating an error report or testing a component after a repair.
- **Release All (*Reset*)** must be pressed to undo all manual operations. You may also need to double-click on the output.

WARNING: THE RESET BUTTON MUST BE PRESSED BEFORE ANOTHER PROGRAM CAN BE STARTED.

SCU

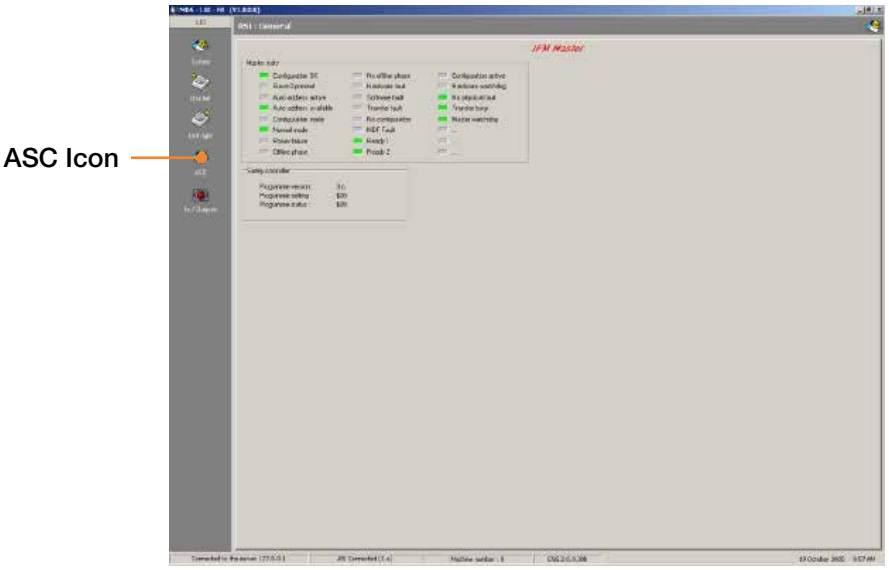


Figure 18 ASC Window

Clicking the **ASC** icon opens the status overview for the SCU master and safety controller.

In the overview, master states are marked gray, green, or red. A state that is gray is inactive, a green state is running OK, and deviations are red.

In the safety controller field, the version number of the safety controller software is reported.

Inputs/Outputs

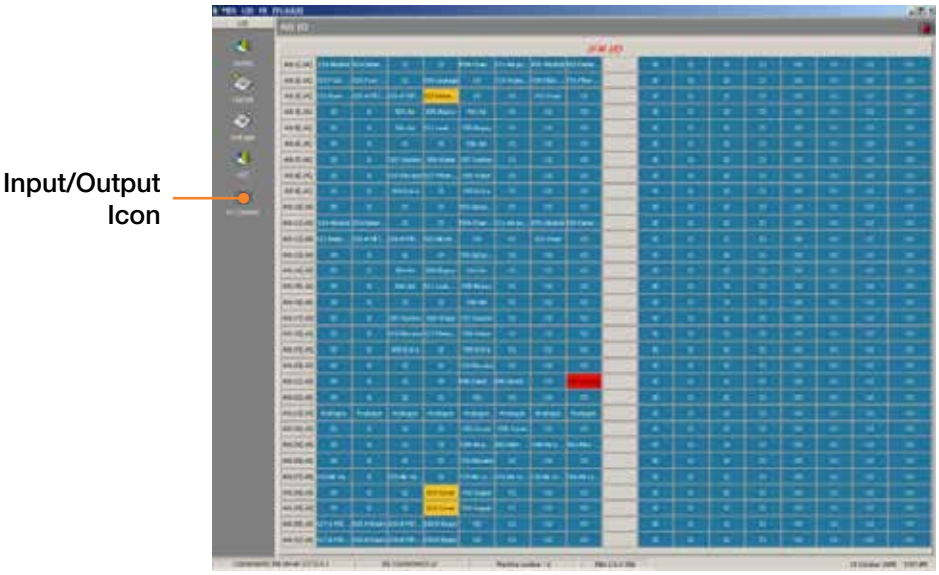


Figure 19 Input/Output Window

You can see input and output status onscreen by clicking the **In/Outputs** icon. The data comes from the IFM-ASi controller in the ADVANTAGE PLUS™ Reprocessor The controller communicates between the ADVANTAGE PLUS Reprocessor and the PC.

NETWORKING

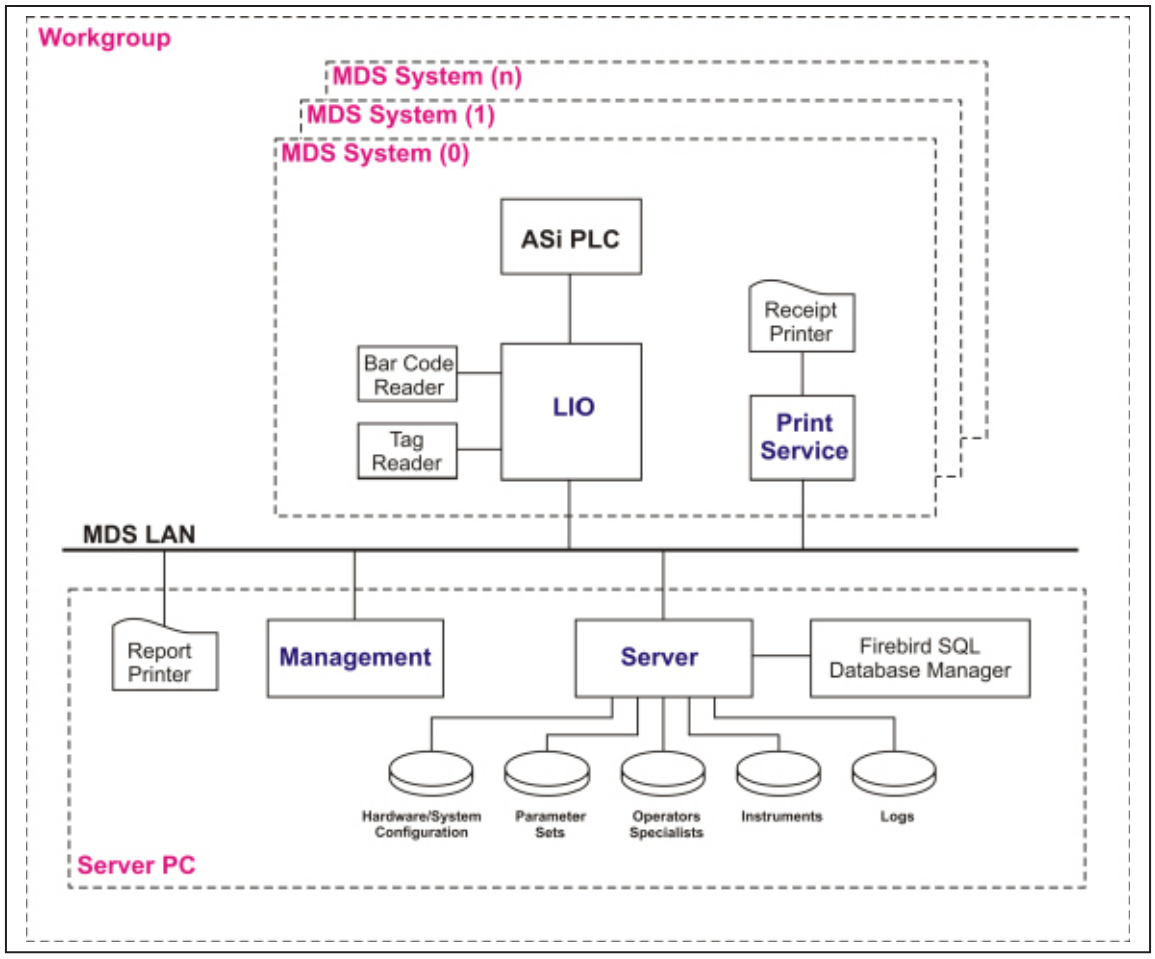
The ADVANTAGE PLUS™ Reprocessor shall be capable of being networked with other ADVANTAGE PLUS Reprocessor units on a local area network. One PC, either part of an ADVANTAGE PLUS Reprocessor unit or a separate stand-alone PC, may be used as the Server. The other ADVANTAGE PLUS Reprocessor units are considered Clients of the Server. The Server PC would run the **Server** and **Management** applications and contain the ADVANTAGE PLUS Reprocessor database where all parameters and cycle results are stored. The Clients would run the **LIO** and **PrintService** applications. In the way each ADVANTAGE PLUS Reprocessor unit (Client) could independently initiate and execute the **Disinfection**, **Recovery** or **Water Line Disinfect** programs with the cycle results being printed to its dedicated receipt printer, while all access to management and administrative functions (parameters, users, cycle logs, etc.) would only be possible through the one Server PC.

To create a network of ADVANTAGE PLUS Reprocessor units, each ADVANTAGE PLUS Reprocessor unit (Client) and the Server PC must be connected to a hub and assigned a unique IP address. In addition, a unique Workgroup must be created and each Client and the Server PC must be configured to belong to this Workgroup. Once the Workgroup has been established, the appropriate applications of the ADVANTAGE PLUS Reprocessor PC software can be loaded on each unit, starting with the Server PC. During the install, when asked for the “Server name or server IP-address” each unit should enter the computer name of the Server PC. Finally, each Client should allow the ADVANTAGE PLUS Reprocessor folder, where the ADVANTAGE PLUS Reprocessor executable applications reside, to be “shared”. All these changes can be done through the Control Panel of each unit.

INTEGRATION TO HIS VIA XML DATAOUTPUT SOLUTION

The ADVANTAGE PLUS Reprocessor **HIS Interface Application** will run as a Windows Service and is connected to an Advantage database. The ADVANTAGE PLUS Reprocessor **HIS Interface Application** can connect to an Advantage database on the ADV software platform or the ADV.Net software platform. Every time a) an endoscope is unloaded from an ADVANTAGE PLUS Reprocessor or b) a chemical bottle is changed in an ADVANTAGE PLUS Reprocessor reservoir, the Advantage database will be updated and the HIS Interface service will receive a notification. When this notification is received, the service will query the database for all the information pertinent to the AER event. This information will be compiled into an XML file that will be uploaded to a location specified in the service’s configuration file.

The application includes a Graphical User Interface (GUI) to configure settings for 1) connecting to the Advantage database, 2) specifying a target location to store the XML files, and 3) licensing the application.



A detailed step-by-step description of the network setup process is described below:

Network Setup

This set of Instructions describes how to set up a network of ADVANTAGE PLUS™ Reprocessor as clients connected to a single server PC. It is assumed the PCs are running Windows XP and the ADVANTAGE PLUS Reprocessor PC software has not been installed on any of the machines.

Server (Database PC)

1. Connect PC to HUB
2. Go to Control Panel > System > Computer Name
3. Click on **Change…**, and change name if necessary. (MDS-Server)
4. Select **Workgroup** and enter **MDS**. Click **OK**.
5. Go to your Control Panel > Network Connections.
6. Click with your right mouse button on **Local Area Connections** and select **Properties**.
7. Select **Internet Protocol (TCP/IP)** and click on **Properties**.
8. Select **Use the Following IP Address** and enter an IP address, for example 254.169.0.1 (MDS-Server). If Subnet Mask is blank, enter something like 255.255.255.0, then click **OK**.
9. Install the **Server**, **Management**, **Database Server** and **Setup Database** applications from the MDS PC software setup file. Enter the computer name when asked for the “Server name or server IP-address”.

Client (ADVANTAGE PLUS™ Reprocessor)

10. Connect PC to HUB
11. Go to Control Panel > System > Computer Name
12. Click on **Change…**, and change name if necessary.
13. Select **Workgroup** and enter **MDS**. Click **OK**.
14. Go to your Control Panel > Network Connections.
15. Click with your right mouse button on **Local Area Connections** and select **Properties**.
16. Select **Internet Protocol (TCP/IP)** and click on **Properties**.
17. Select **Use the Following IP Address** and enter an IP address, for example 254.169.0.10 (MDS 4010). If Subnet Mask is blank, enter something like 255.255.255.0, then click **OK**.
18. Install the **LIO** and **PrintService** applications from the MDS PC software setup file. Enter the name of the Server PC (MDS-Server) when asked for the “Server name or server ip-address”.
19. Go to the ADVANTAGE PLUS™ Reprocessor folder in **Program Files**, click on your right mouse button and select **Sharing and Security…**.
20. Select **Share this Folder** and click **OK**.

Both PCs (Server and Client)

21. Restart Windows on both PC’s.
22. Open **My Network Places** from your desktop and click on Entire Network > Microsoft Windows Network. You should see a MDS folder with two PC’s inside (the shared MDS-Server and MDS-4010 folder).

Server (Database PC)

23. Start the **Server** application on the Server PC.

Client (ADVANTAGE PLUS Reprocessor)

24. Start **LIO** on the ADVANTAGE PLUS Reprocessor PC.

If the ADVANTAGE PLUS Reprocessor PC software has previously been installed on the ADVANTAGE PLUS Reprocessor units, these instructions should be followed instead of those described above.

Both PCs (Client and Server)

1. Take a HUB.
2. Connect each PC with a network cable to the HUB.
3. Make sure both computers have a unique computer name (for example MDS-Server and MDS-4010).
4. Go to your Control Panel > System > Computer Name
5. Click on **Change…**, and change name if necessary.
6. Select **Workgroup** and enter **MDS**.
7. Go to your Control Panel > Network Connections.
8. Click with your right mouse button on **Local Area Connections** and select **Properties**.
9. Select **Internet Protocol (TCP/IP)** and click on **Properties**.
10. Select **Use the Following IP Address** and enter an IP address, for example 254.169.0.10 (MDS 4010). If Subnet Mask is blank, enter something like 255.255.255.0, then click **OK**.
11. Do the same for the second PC (or server), for example 254.169.0.1 (MDS-Server). If Subnet Mask is blank, enter something like 255.255.255.0, then click **OK**.

Client (ADVANTAGE PLUS™ Reprocessor)

12. Go to **Start** on your taskbar and select **Run…** and then enter **regedit**.
13. In the **Registry Editor** open <HKEY_LOCAL_MACHINE> > <SOFTWARE> > <MDS>
14. Select **LIO** folder and double-click on **ServerAddress**. Change the **value data** to the name of the server (for example MDS-Server).
15. Select **Management** folder and double-click on **ServerAddress**. Change the **value data** to the name of the server (for example MDS-Server).
16. Go to the ADVANTAGE PLUS™ Reprocessor folder in **Program Files**, click on your right mouse button and select **Sharing and Security…**.
17. Select **Share this Folder** and click **OK**.

Both PCs (Client and Server)

18. Restart Windows on both PC's.
19. Open **My Network Places** from your desktop and click on Entire Network > Microsoft Windows Network.
20. You should see a ADVANTAGE PLUS Reprocessor folder with two PC's inside (the shared MDS-server and MDS-4010 folder).

Server (Database PC)

21. Start the **Server** application on the Server PC.

Client (ADVANTAGE PLUS Reprocessor)

22. Start **LIO** on the ADVANTAGE PLUS Reprocessor PC.

NOTES

APPENDIX A

REGISTRATION FORMS

Sample registration forms are provided for system administration functions.

NOTES

ADVANTAGE PLUS™ REPROCESSOR

Instrument Registration Form

Endoscope Code	
Instrument Type	
Brand	
Barcode	
Type Code	
Serial Number	
Internal ID	
Tag Code	
Date	
Endoscope Code	
Instrument Type	
Brand	
Barcode	
Type Code	
Serial Number	
Internal ID	
Tag Code	
Date	
Endoscope Code	
Instrument Type	
Brand	
Barcode	
Type Code	
Serial Number	
Internal ID	
Tag Code	
Date	

NOTES

ADVANTAGE PLUS™ REPROCESSOR

Operator Registration Form

Name	
Login Name	
Group	
Barcode	
Tag Code	
Staff Code	
Password	
Date	
Name	
Login Name	
Group	
Barcode	
Tag Code	
Staff Code	
Password	
Date	
Name	
Login Name	
Group	
Barcode	
Tag Code	
Staff Code	
Password	
Date	

NOTES

ADVANTAGE PLUS™ REPROCESSOR

Physician Registration Form

Name	
Staff Code	
Barcode	
Specialist or Assistant	
Date	
Name	
Staff Code	
Barcode	
Specialist or Assistant	
Date	
Name	
Staff Code	
Barcode	
Specialist or Assistant	
Date	
Name	
Staff Code	
Barcode	
Specialist or Assistant	
Date	
Name	
Staff Code	
Barcode	
Specialist or Assistant	
Date	

NOTES

APPENDIX B

REPLACEMENT PART NUMBERS

REPLACEMENT PART NUMBERS

Description	Order #
Accessory Bags	CB12-0002
Active Vapor Management Filter	MF01-0068
Air Filter (pkg. 8)	MF01-0028
Air Compressor Filter Kit	3-9-452
Basin Drain Filter (pkg. 12)	MF01-0059
Basin Drain Filter Hook (ea.)	5-6-170
Barcode Tags (100-199)	67199-157
Barcode Tags (200-299)	67199-158
Barcode Tags (300-399)	67199-541
Barcode Tags (400-499)	67199-660
Disinfection block (ea.)	78399-902
Water Pre-Filter 1 Micron Nominal	MF01-0070
Water Pre-Filter 0.4 Micron Nominal	MF01-0071
Water Filter 0.1 Micron Absolute Bacterial Retentive	MF01-0069
Sampling Cups	ML02-0121
Silicone Oil	17599-496

APPENDIX C

WARRANTY

NEW PRODUCT WARRANTY

Limited Warranty

Subject to the terms below, Medivators Inc. (the “Company”) warrants that its products (the “Products”) will conform to the Company’s written specifications (where applicable) and will be free from defects in material and workmanship under normal use and service for the following periods (the “Warranty Period”):

Endoscope reprocessors and associated equipment, and Irrigation Pumps: fifteen (15) months from date of shipment from the Company or one (1) year from the date of installation, whichever occurs first.

Consumables, accessories, and Product service parts, including, but not limited to, endoscope hookups, filters, printers, printer supplies, test strips, accessory bags, and service parts for products: ninety (90) days from the date of installation or one hundred and twenty (120) days from the date of shipment, whichever occurs first.

Disposable Products: warranted for single use. The Warranty Period will not in any case exceed the expiration date on the Product label.

The warranty does not cover, and the Company will have no warranty obligation whatsoever with respect to, any damage to a Product caused by or associated with: (i) external causes, including without limitation, accident, vandalism, acts-of-God, power failure or electric power surges, (ii) abuse, misuse or neglect of the Product by the customer or use of unauthorized third party filters or other consumables and accessories, (iii) usage not in accordance with product instructions, (iv) the customer’s failure to perform required preventive maintenance, or (v) servicing or repair not authorized by the Company.

Limitation of Remedy

The warranty obligation of the Company hereunder is limited to (at its option) (i) the repair or replacement of the defective Products or any parts it deems defective, or (ii) a refund of the purchase price. This will be customer’s exclusive remedy for a covered defect.

In order to recover under the warranty, the customer must notify the Company in the state (if in the U.S.A.) or the country of installation, of the defect (describing the problem in reasonable detail) prior to the expiration of the Warranty Period and within thirty (30) days of discovery of the defect. Upon receiving the Company’s official “Returned Material Authorization” (RMA), the customer must promptly return the defective part or Product to the Company (or the service center indicated on the RMA), freight and insurance prepaid. The Company will not be responsible for any damage during shipment.

Warranty Disclaimer

THE WARRANTY ABOVE IS THE COMPANY'S ENTIRE WARRANTY OBLIGATION TO THE PURCHASER OF PRODUCTS. IT IS IN LIEU OF ALL OTHER WARRANTIES OF THE COMPANY, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, AND THE COMPANY DOES NOT REPRESENT OR WARRANT THAT ANY PRODUCT WILL MEET CUSTOMER'S REQUIREMENTS. THE COMPANY'S RESPONSIBILITY FOR DEFECTS IN A PRODUCT IS LIMITED SOLELY TO REPAIR, REPLACEMENT OR REFUND OF THE PURCHASE PRICE AS SET FORTH IN THIS WARRANTY STATEMENT.

TO THE EXTENT PERMITTED BY LAW, THE COMPANY SHALL NOT, UNDER ANY CIRCUMSTANCES, BE LIABLE TO CUSTOMER FOR CONSEQUENTIAL, INCIDENTAL, INDIRECT, PUNITIVE OR SPECIAL DAMAGES OR LOSSES, INCLUDING WITHOUT LIMITATION, DAMAGES ARISING OUT OF OR IN CONNECTION WITH ANY MALFUNCTIONS, DELAYS, LOSS OF PROFIT, INTERRUPTION OF SERVICE, OR LOSS OF BUSINESS OR ANTICIPATORY PROFITS, EVEN IF THE COMPANY HAS BEEN APPRISED OF THE LIKELIHOOD OF SUCH DAMAGES OCCURRING.

This Warranty gives the customer of Products specific legal rights, and customers may also have other rights which vary from jurisdiction to jurisdiction.

In no event shall the Company's liability exceed the original purchase price of the covered Product.

No representative or agent of the Company has any authority to bind the Company to any other representation or warranty with respect to the Products, and the customer accepts the Products subject to all of the terms above.

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