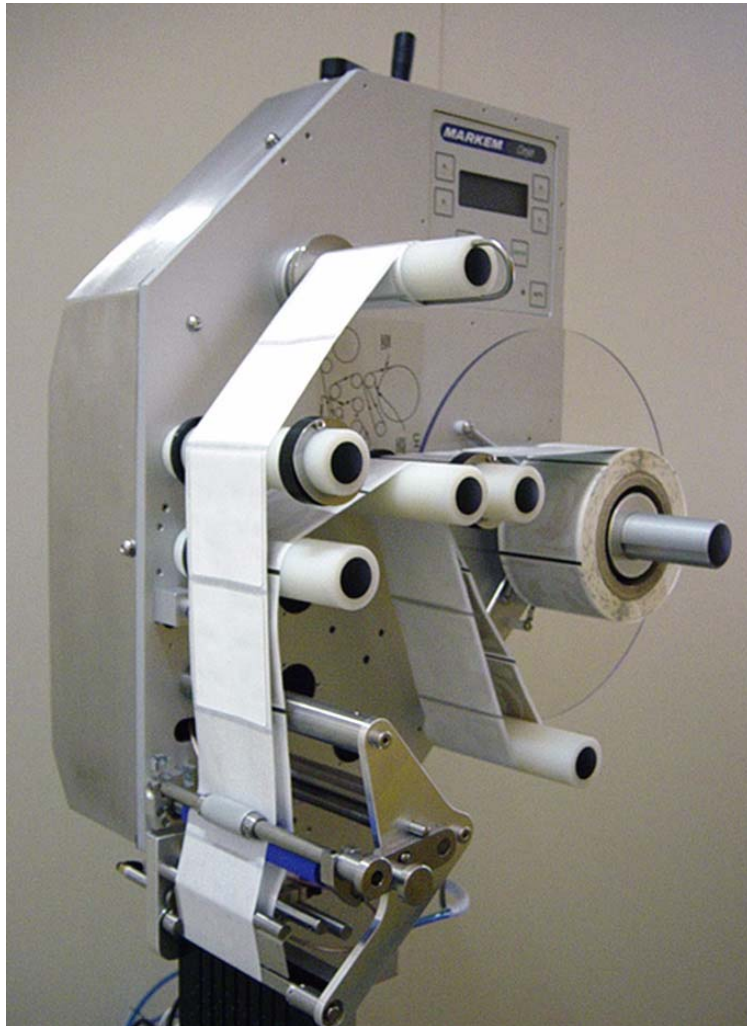# Operation/Service Manual

Cimjet® RFID

MARKEM ®

WARRANTY

All MARKEM products are warranted to be free of defects in materials and workmanship and to conform to MARKEM specifications in effect at the date of shipment to Buyer. Any changes Buyer requests to MARKEM specifications are not effective without advance, written authorization by MARKEM. The warranty period is as follows:

Machines: One year from date of shipment to Buyer or 2000 operating hours, whichever expires first, unless any specific machine is designated on an order or otherwise as Made to Order ("MTO"), in which event the warranty period is 90 days from date of shipment to Buyer.

Ink Jet Orifice Plates (on new machines and as replacement parts): 90 days from date of shipment to Buyer.

Replacement Parts: 90 days from date of shipment to Buyer.

Software: 90 days from date of shipment to Buyer. Warranty does not entitle Buyer to new releases, upgrades or enhancements introduced during the warranty period.

Supply Products: For the period of shelf life of the supplies as stated in the applicable specification standards or one year from the date of shipment to Buyer if not specified.

During the warranty period, MARKEM will, at its option, repair, replace or refund the purchase price of MARKEM products which prove to be defective in materials or workmanship or which do not conform to the applicable MARKEM specifications. Within MARKEM service travel areas for certain products designated by MARKEM, warranty service for machines and parts will be provided at the installation site. In all other cases, products must be returned to a service facility designated by MARKEM.

For products returned to MARKEM for warranty repair or replacement, Buyer shall obtain a return authorization number and shipping instructions from MARKEM and return the product shipping charges prepaid. Shipping charges for the return of products to Buyer shall be paid by MARKEM within the contiguous forty-eight United States and the District of Columbia; for all other locations, the warranty excludes all costs of shipping, customs clearance and any other related charges. All replaced products shall become the property of MARKEM.

The foregoing warranty shall not apply to any custom work performed by MARKEM. The foregoing warranty shall also not apply to defects or non-conformance with MARKEM specifications which result from: (l) improper installation, use, storage, care or maintenance by Buyer; (2) wear resulting from normal use of parts subject to wear, such as ink rolls, offset pads, foil feeds, thermal transfer print heads, etc.; (3) modification, alteration or retiming of a MARKEM machine; (4) cycling a MARKEM machine out of specification; or (5) adding a unit timed or driven by a MARKEM machine; (6) use of products (including supplies) or software not furnished by MARKEM (7) accident, neglect, misuse or abuse; or (8) exposure conditions outside the range of the environmental, power and operating specifications provided by MARKEM.

NO OTHER WARRANTY IS EXPRESSED OR IMPLIED. MARKEM SPECIFICALLY DISCLAIMS ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Determination of the suitability of the products described on the face of the quote and/or invoice is the sole responsibility of the Buyer and MARKEM shall have no responsibility in connection therewith. BUYER WARRANTS THAT HE IS NOT PURCHASING THE PRODUCTS FOR PERSONAL, FAMILY OR HOUSEHOLD PURPOSES. THE REMEDIES PROVIDED HEREIN ARE BUYER'S SOLE AND EXCLUSIVE REMEDIES.

LIMITATION OF LIABILITY: MARKEM SHALL NOT BE LIABLE FOR ANY INDIRECT, SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES, WHETHER BASED IN CONTRACT, TORT OR ANY OTHER LEGAL THEORY, OR FOR THE COST OF SUBSTITUTE GOODS. CONSEQUENTIAL DAMAGES for purposes of this Agreement shall include, without limitation:

1. Loss of use, income or profit, or losses sustained as a result of the injury (including death) to any person or loss or damage to property, including, without limitation, materials manufactured, processed or labeled by the use of the products.

2. Damages arising out of or in connection with delays in delivery, MARKEM's performance, non-performance or breach of this contract, defects in the equipment, failure of the products to perform properly or non-conformance of the products with specifications or the operation, use, installation, repair or replacement of the products.

0874339 Rev. 08 11/03

This guide explains the basic operation and care of the Model Cimjet® RFID System.

To the best of our knowledge, the information contained in this guide was correct at the time of publication. However, continual enhancement of our products can result in some differences between the instructions represented in this guide and your printer.

MARKEM is a registered trademark of MARKEM Corporation.

This guide was written by:

> MARKEM Corporation
> 150 Congress Street
> Keene, New Hampshire 03431 U.S.A.

Reference List

The information on your packing slips can be written below for reference. When contacting MARKEM please give your Model Number, Serial Number, and Customer Account Number.

Model _____ Serial Number_____ Date Installed_____

Customer Account Number_____

Name of MARKEM Representative_____

Options/
Accessories_____
_____
_____
_____
_____
_____
_____
_____

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SECTION 1

General Information

1.0   Welcome to the Model Cimjet RFID

The Cimjet RFID is a high speed, compact RFID tag dispenser and applicator that is compatible with a full range of MARKEM products.

1.1   What is in this Guide?

The Cimjet RFID manual addresses the basic installation, operation and care of the RFID tag dispenser, as well as safety, maintenance, troubleshooting, and service information. For more applicator information, refer to the **Cimjet RFID Blow Applicator Manual (0855906)** and the **Cimjet RFID Tamp Applicator Manual (0855907).**

1.2   Glossary

active tags – tags that use batteries as a source of power (can be either partial or complete power); there are tags with replaceable batteries and tags that have the batteries inside a sealed unit – sometimes called **unitized active tags**

addressability – ability to address bits, fields, files or other portions of storage in a tag

antenna – conductive elements that radiate and/or receive energy in the radio frequency spectrum to or from the tag

bi-directional – a tag that can be read or written from either side

capacity – amount of bits or bytes that can be programmed into a tag; these may be bits accessible to the user, or the total number, including those reserved for the manufacturer (such as parity or control bits)

electronic tag – a tag that has an electronic RFID tag embedded within it

EMC – electromagnetic compatibility

frequency – number of times a signal makes a complete pass through its maximum and minimum values and returns to the same value (cycles)

misread – a condition that exists when the data presented by the reader does not match the corresponding data in the tag

passive tags – tags that do not contain an internal power source; they are externally powered and usually get their power from the carrier signal radiated from the scanner

programming – adding information to or altering a tag

programmability – data and identification information must be entered into tags in order for them to become identifiers of specific objects; this capability is called **programmability**

programmer – tag contents can be changed by a set of electronics in close proximity or in electrical contact with them; those electronics and their packaging are called a **programmer**

RFID – systems that read or write data to RF (radio frequency) tags that are present in a radio frequency field projected from RF reading/writing equipment; data may be contained in one or more bits for the purpose of providing identification and other information relevant to the object the tag is attached to; it uses electromagnetic or electrostatic coupling in the radio frequency portion of the spectrum to communicate to or from a tag through a variety of modulation and encodation schemes

range – distance at which successful reading and/or writing can be attained

read – decoding, extraction and presentation of data from formatting, control and error management bits sent from a tag

readability – ability to extract data under less than optimal conditions

read rate – maximum rate at which data can be read from a tag, expressed in bits or bytes per second

read/write – many applications require that new data, or revisions to data already in the tag, be entered into the tag while it is still attached to its object; tags with this capability are said to be reprogrammable and are called **read/write tags, memory cards,** or **memory modules**

reader – device containing the digital electronics that extract and separate the information from the format definition and error management bits; digital electronics perform the actual reading function; these read electronics may also interface to an integral display and/or provide a parallel or serial communications interface to a host computer or industrial controller

reader/writer – the set of electronics can change the contents of the tags while they are still attached to their object; they are called the **reader/writer** (see **reader**)

reprogrammable – many applications require that new data, or revisions to data already in the tag, be entered into the tag while it is still attached to its object; the ability to read from and write data to the tag while it is attached to its object is called **in-use programming**; tags with this capability are said to be reprogrammable and are called r**ead/write tags, memory cards,** or **memory modules**

scanner – the antennae, transmitter (or exciter) and receiver electronics are integrated in a single package called the scanner; they may be combined with additional digital electronics, including a microprocessor in a package called a **reader**

tag – the transmitter/receiver pair, or the transceiver plus the information storage mechanism, attached to the object, is referred to as the tag, transponder, electronic tag, code plate, and various other terms. Although **transponder** is technically the most accurate, the most common term and the one preferred by the Automatic Identification manufacturers is **tag**

transponder – see **tag**

verify – assure that the desired operation was performed correctly

write – transfer of data to a tag; the tag's internal operation of storing the data, sometimes including the data, in order to verify the operation

write rate – rate at which information is transferred to a tag, written into the tag's memory and verified as being correct; it is quantified as the average number of bits or bytes per second in which the complete transaction can be performed

2.0   Safety Information

2.1   EMC (Electromagnetic Compatibility) Considerations

To maintain the integrity of the EMC precautions taken with the Cimjet RFID, all connecting cables **must** be fully screened, and the screen **must** have 360 degree contact with the metal connector and, in turn, the unit's case at both ends.

2.2   Modifications to Cimjet RFID

Any changes or modifications not expressly approved by MARKEM that could affect FCC Compliance could void the user's authority to operate the Cimjet RFID.

2.3   Electrical Safety

- Incoming supply cable should be rated at 10A minimum for the Cimjet RFID (independent of nominal supply voltage)

Maximum switch-on supply current surge for the Cimjet RFID is as follows: Cimjet RFID Maximum current level = 70A,
Duration = 6ms

Recommended cable protection is as follows:

- MCB (Miniature Circuit Breaker): to IEC 947-2 / EN 60947-2 and BS EN 60898 with a minimum instantaneous release response current of 10x rated current (type D)

- Klockner Moeller type FAZNS 6-2 (6A, 2 pole type D)

- Merlin Gerin type C60 HD 206 (6A, 2 pole type D)

Note: The Klockner Moeller or Merlin Gerin circuit breakers are recommended. An equivalent MCB can be used.

Fuses

- Use 10A HRC or HBC type fuses with a minimum of 95A RMS symmetrical prospective current rating, at a 10ms minimum pre-arcing time, such as ASTA certified to BS88 part 2 'pullcap' type or equivalent.

Electrical safety testing (after installation)

WARNING: **It is essential that the continuity of the protective bonding circuit and the prospective short circuit current level be checked after the machine is installed and the electrical connections, including those to the power supply, are complete. A competent person must carry out these tests.**

Test equipment required: Digital Loop and PSC Tester (such as Robin Model KMP4120 Digital PSC-LOOP Tester)

- Connect tester to incoming mains supply to machine.
- Check that the supply voltage is within specification and that the connections are correctly wired (indicated on the tester).
- Select the 20 ohms scale on the tester and press the **Test** button to check the value of earth fault loop impedance for the power supply provided.

If a class **D MCB** to **BS EN 60898** or equivalent protects the supply, then the maximum impedance should be **2 ohms**.

If the supply is protected by a **BS88** part 2 style fuse, then the maximum impedance should be **5.33 ohms**.

Select the PSC (Prospective Short Circuit Current) test and check that the PSC level does not exceed **1500A**.

WARNING: **Failure to carry out these tests will potentially result in an unsafe installation, and the equipment fault-clearance ability may not function correctly.**

2.4   Machine Safety

The product is designed to conform to all current Machine Safety Regulations. **Please read through this section before operating this machine.**

This feeder is designed for use with the following supply systems that conform to IEC 664 light industrial / domestic installation category II main supply.

- 'TN' (any of following - TN-C, TN-S or TN-C-S) For example: a system having one or more points of the source of energy directly earthed; the exposed conductive parts of the installation being connected to that point by protective conductors

- 'TT' - For example: a system having one point of the source of energy directly earthed; the exposed conductive parts of the installation being connected to earth electrodes electrically independent of the earth electrodes of the source

- It is **NOT** suitable for connection to an 'IT' system. For example: a system having no direct connection between live parts and earth, the exposed conductive parts of the installation being earthed; this, therefore, excludes any 'phase to phase' connected supplies such as what might be available in some factories and/or countries

If either supply fuse (located on the rear of the controller, below the supply connector) is replaced, it **must** be replaced by an HBC Style ceramic fuse with the rating shown as 'T5AH250V.'

WARNING: Installation must only be performed by qualified MARKEM personnel. For customer installations, authorization must be obtained from MARKEM. All relevant Safety Procedures must be followed. Failure to do so may void the warranty.

1. The Cimjet RFID must be disconnected from the main power supply before removing the cover from the I/O interface board. Make sure that any external interlocked machines are also disconnected from the power supply.

2. **DO NOT** touch restrictors/regulators that are mounted inside the rear dispenser cover. These are pre-set at the factory for your safety.

3. **ALWAYS** disconnect the power to the machine before removing any covers. You must remove the plug from the main power supply.

4. **DO NOT** operate the machine with any covers removed. All covers must be in place using the appropriate number of fasteners. It is essential that electrical and non-electrical

connector dust covers provided with the machine are fitted to all unused connectors to protect against dust and dirt and prevent possible static damage to internal components.

5. **DISCONNECT** the air supply before undertaking work on the applicator.

6. **DO NOT** adjust the internal cylinder regulator pressure under any circumstances. Doing so could make the Cimjet RFID unsafe.

7. It is possible for the machine to become unstable when being moved. The machine must be lowered to its lowest possible position before moving, and care must taken to prevent personal injury.

8. Loading tags can present a risk if the machine is mounted high up as the tag reels are heavy. It may be necessary to provide a platform on which to stand, enabling the operator to load tag reels safely, without risk of personal injury. When lowering the machine, be sure a minimum of two people reposition or move the machine and that it is fully supported.

9. Always take care when moving around the machine not to slip, trip, or fall, especially when the machine is used in areas where the floor may be wet or greasy.

10. Be aware of the operating zone required by the Cimjet RFID when working with and near the machine. Allow ample space beyond the applicator operation zone to ensure operator safety. Be certain all reasonable safety precautions have been undertaken; however, when working with or around the machine, take care to avoid potential hazards. If the customer has any safety concerns, guarding must be provided by the customer.

11. Be aware that free items, such as loose clothing or long hair, could become entangled or trapped in the Tag Nip Roller or paper path during the operation of the machine. A warning sticker is fitted locally to highlight the hazard.

12. Beware of the unlikely event of an electronic fault causing an unexpected start-up or overrun of the pneumatic cylinders or feeder drive motors, which could cause possible injury.

13. The regulator mounted inside the rear dispenser cover is set to 1.86 Bar for safety reasons and should only be serviced or replaced by trained personnel. If the cylinder pressure is raised above 1.86 Bar, the customer must provide additional guarding for operator safety.

14. Make sure that the maximum light emission power and classification for any/all laser(s) used on this machine, do not

exceed those specifications stated in the appropriate laser safety standards IEC825. When irregularities are detected in the laser beam generation, internal protective devices must switch the laser beam off.

15. Various safety and warning labels are placed on the Cimjet RFID (see following pages).

WARNING: These labels are provided for your safety and should not be ignored or removed.

16. All fixing screws in all covers must be used to ensure EMC integrity.

2.5   Safety Labels
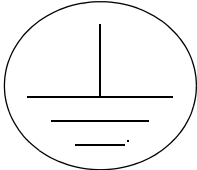
The safety information in this manual is correct to the best of our knowledge, information, and belief at the date of this publication. The information given is designed only as guidance for safe handling use, processing, storage, transportation, disposal and release and is not considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process unless specified in text.

Table 1–1 Safety Labels

Line Voltage Part Number BO5263AA	There is a danger of electrical shock during checks and repair. Remove the power cord from the electrical outlet before performing all checks and repair. All electronic checks must be performed by a qualified technician.
Hot Surfaces Part Number BO5265AA	To prevent mild injury from burns, be careful not to directly touch any surface where this safety sticker is placed.

Table 1–1 Safety Labels

Hazard Warning ⚠ Part Number BO5262AA	Hazard warning safety labels are placed in strategic positions around the machine to highlight potential hazards to the operator.
Earth ⏚ Part Number BO5264AA	Earth labels are placed in strategic positions around the machine to highlight the machines earthing point.
⚡ 115V AC Part Number 34976BA	**Use only 115V** connections where you find this safety label.
⚡ 230V AC Part Number 34977BA	**Use only 230V** connections where you find this safety label.

2.6 Isopropanol Safety

Table 1–2 Isopropanol Safety

Product Name	Isopropanol Wipes
Part Number	BO4985AA
Product Name	Isopropanol Cleaning Kit
Part Number	BO3285AA
Product Name	Isopropanol Top Up Kit
Part Number	BO3286AA
Supplier	MARKEM Technologies Ltd. Alexander Fleming Building, Nottingham Science and Technology Park, University Boulevard, Nottingham, NG7 2RF
Composition/Information on Ingredients	
Identification of the preparation Chemical Name CAS-No EEC No Class Weight%	Isopropanol Wipes Cloth impregnated with 2ml fluid ~PROPAN-2-OL 67-63-0 200-746-9 F:R11<90 Sweden: V:R30 / 322, R313 Non Hazardous Constituents>10 Isopropanol Kits Alcohol ~PROPAN-2-OL 67-63-0 200-661-7

Table 1–2 Isopropanol Safety

Hazards Identification	
Isopropanol Wipes Most Important Hazards	Highly Flammable
Isopropanol Kits Most Important Hazards	Highly Flammable
Specific Hazards	May cause slight eye / skin irritation. May cause irritation of respiratory tract. High concentration of vapors may induce unconsciousness / narcosis. Solvents may degrease the skin.
First Aid Measures	
General Advice	Use in well ventilated areas
Inhalation	Take patient to fresh air. Do not move about. Obtain medical advice.
Skin Contact	Remove spillage with soft tissue and / or wash off skin with cool water. Obtain medical advice in extreme cases.
Eye Contact	Irrigate thoroughly with water for at least 10 minutes. Obtain medical advice.
Ingestion	
Isopropanol Wipes	Wash out mouth thoroughly and obtain medical advice.
Isopropanol Cleaning Kit / Isopropanol Top Up Kit	Drink water and obtain medical advice.

Table 1–2 Isopropanol Safety

Fire Fighting Measures	
Isopropanol Wipes	Carbon Dioxide, Dry Chemical Foam / Water Spray
Isopropanol Cleaning Kit	Water Spray, Dry Powder or Vaporizing Liquids
Isopropanol Top Up Kit	Carbon Dioxide, Dry Chemical Foam / Water Spray
Accidental Release	
Personal Precautions	Remove all sources of ignition. Wear suitable gloves and eye/face protection.
Environmental Precautions	Clean with water and dispose of water and isopropanol according to your local environmental regulations. Otherwise, absorb on an inert absorbent (sand, silica gel, acid binder, universal binder, sawdust) transfer to container and arrange removal by disposal company. Ventilate area to dispel residual vapor.
Handling and Storage	
Handling	Use only in well ventilated areas. Do not breathe vapors or spray mist. Avoid contact with the skin and the eyes. When using isopropanol, do not eat, drink or smoke.
Storage	Keep in a cool, well ventilated place. Keep product and empty container away from heat and sources of ignition. Take precautionary measures against static discharges.

Table 1–2 Isopropanol Safety

Exposure Control/Personal Protection	
Personal Protection Equipment	Respiratory protection; adequate ventilation
Hand Protection	Solvent resistant gloves
Eye Protection	Safety glasses/face shield
Skin and Body Protection	Plastic apron/sleeves/boots (dependent on amount handled)
Physical and Chemical Properties	
Isopropanol Wipes	
Form	Of Liquid
Color	Colorless
Odor	Characteristic
Melting Temperature	-89°C
Boiling Temperature	82°C
Density (g/ml)	0.78
Vapor Pressure	33 mmHg, 20°C
(Density)	(2.07)
Solubility in Water	Miscible in all proportions
Flash Point	12°C
Explosion Limits	Lower: 2.3%, Upper: 12%
Auto Ignition Temperature	425°C

Table 1–2 Isopropanol Safety

Isopropanol Kits	
Form	Liquid
Color	Colorless
Odor	Characteristic
Melting Temperature	-89°C
Boiling Temperature	82°C
Density (g/ml)	0.78
Vapor Pressure	33 mmHg, 20°C
(Density)	(2.07)
Solubility in Water	Miscible in all proportions
Flash Point	12°C
Explosion Limits	Lower: 2.3%, Upper: 12%
Auto Ignition Temperature	425°C

Table 1–2 Isopropanol Safety

Stability and Reactivity	
Stability	Stable; vapors may form explosive mixture with air
Conditions to Avoid	Keep away from heat and sources of ignition
Materials to Avoid	Oxidizing agents, strong bases, aldehydes, ammonia, chlorinated compounds, amines, organic nitro compounds, aluminium
Hazardous Decomposition Products	Peroxides

Table 1–2 Isopropanol Safety

Toxicological Information	
Isopropanol Wipes	
Acute Toxicity	IPA: LD50/oral/rat= 5.04 g/kg LD50/dermal/rabbit = 16.4 ml/kg
Local Effects	May cause skin irritation in susceptible persons
Sensitization	May cause sensitization by skin contact
Long-term Toxicity	Liver injury may occur
Chronic Toxicity	Effects of excessive exposures may include liver toxicity
Isopropanol Kits	
After Inhalation	Irritation symptoms in the respiratory tract
After Absorption	Headache, dizziness, inebriation, unconsciousness, narcosis
After Uptake of Large Quantities	Respiratory paralysis, coma
After Skin Contact	Irritation
After Eye Contact	Irritation
Further Data	LD50 5045 mg/kg oral, rat. No evidence of carcinogenic properties; evidence of reproductive effects

Table 1–2 Isopropanol Safety

Ecological Information	
Isopropanol Wipes	Not readily biodegradable
IPA	LC50/96h fathead minnows = 9600mg/1
Isopropanol Kits	No environmental hazard provided that the material is handled and disposed of with due care and attention
Disposal Considerations	
Waste from Residues/Unused Products	Dispose of as special waste in compliance with local regulations
Regulations 1980, Contaminated Packaging	Store containers and offer for recycling of material according to local regulations

Table 1–2 Isopropanol Safety

Transport Information	
Isopropanol Wipes	
UN-No	1219
Item	3^o(b)
HI/UN No	1219
Proper Shipping Name	Isopropanol
IMO Class	3.2
IMDG Page	3244
EmS	3-06
MFAG	305
Proper Shipping Name	Isopropanol
ICAO Class	3
UN/ID No	1219
Proper Shipping Name	Isopropanol
Isopropanol Kits	
UN-No	1219
IMDG Class	II
IMO	3.2/1219
Packaging Group	II
TATA	1219
Packaging Group	II
Correct Technical Name	Isopropanol (Isopropyl Alcohol)
ADR/RID	3, 3^o(b)

Table 1–2 Isopropanol Safety

Regulatory Information	
Labeling According to EEC Directives	90/492/EEC
Symbol	F Highly Flammable
R Phrase (s)	R11 Highly Flammable
S Phrase (s)	S2, Keep out of reach of children. Keep container tightly closed in a cool, well ventilated place. S7-16, Keep away from sources of ignition - NO SMOKING. S33, Take precautionary measures against static discharges.

2.7   Foreseen Use/Misuse

This manual provides information about Safety, Installation, Operation, Troubleshooting, Illustrated Parts, Electrical Schematics, Recommended Spares and Preventive Maintenance Procedures. Using the Cimjet RFID in any other manner is considered a misuse of the product. Please consult your local MARKEM Business Center before using this Cimjet RFID for anything other than the foreseen use.

Misuses include, but are not limited to:

- Operating a system that is incomplete, cannot be serviced, or has been modified without authorization
- Failing to observe hazard requirements in the manual and/or on safety labels
- Combining or interfacing non-MARKEM equipment with this system, other than as intended
- Permitting a person who has not been fully trained to operate and/or service the system
- Using unspecified supplies or material which may produce unsatisfactory or unexpected results

2.8   MARKEM Training Programs

Operators, maintenance personnel, and service technicians are considered "qualified" when they have gained, through training and experience, an understanding of safe and correct methods of operation, maintenance, or repair.

MARKEM conducts training programs. In addition to ongoing courses about current machine models, customers are invited to inquire about any training need.

2.9   Removal from Service

Follow these instructions to remove the Cimjet RFID tag applicator from service. These instructions also pertain to transporting or storing the applicator.

1. Turn off the power to the Cimjet RFID

2. Disconnect the power cables from the system

3. Disconnect all other cables from the system

4. Disconnect the air supply

5. Carefully move the Cimjet RFID to the desired location and repackage the system in the original shipping containers

3.0   Overview

The Cimjet RFID is a high speed, compact RFID tag dispenser and applicator.

The key features of the Cimjet RFID are:

Different applicator modules to suit specific applications - Front, top, side, or front and side apply. For more applicator information, refer to the **Cimjet RFID Blow Applicator Manual (0855906)** and the **Cimjet RFID Tamp Applicator Manual (0855907).**

- **Left- or right-hand machine orientation to suit the application**
- **Easy loading of tags**
- **Networking and stand-alone operation**
- **Operator and maintenance diagnostics -** On-screen display of **Error** and **Warning** messages with corrective action to be taken
- **Compatibility -** Compatible with the full range of MARKEM products (Cimpak®, SmartDate®, Series 5000, 9096, SmartLase®, Cimjet 300®), all of which can share the same network

Figure 1–1 Cimjet RFID Dispenser (left-hand option shown)

3.1   Components of Cimjet RFID

The Cimjet RFID consists of a Dispenser and an Applicator.

The main components of the Cimjet RFID are shown in **Figures 1-2, 1-3,** and **1-4**. In addition, Cimjet RFID is usually supplied with an adjustable height stand.

3.1.1   Dispenser

The tag dispenser provides the tag supply and can be left-hand or right-hand. It consists of:

- Tag drive
- Sensors for tag control
- Operator interface

The dispenser is the main body of the Cimjet RFID and supports a variety of different mountable applicator modules.

3.1.2   Applicator

Several modular applicators are available to meet your different requirements.

The different applicators apply tags in different ways (for example: air-blow, or telescopic tamp). The choice of applicator also determines the face of the product that is tagged.

The applicator selected may vary from the type shown in the following figures.

For more applicator information, refer to the **Cimjet RFID Blow Applicator Manual (0855906)** and the **Cimjet RFID Tamp Applicator Manual (0855907).**

3.2   Tag Sizes

Tag sizes are applicator-specific.

For more information, refer to the **Cimjet RFID Blow Applicator Manual (0855906)** and the **Cimjet RFID Tamp Applicator Manual (0855907).**

Figure 1–2 Cimjet RFID - Front

Figure 1–3 Cimjet RFID - Rear
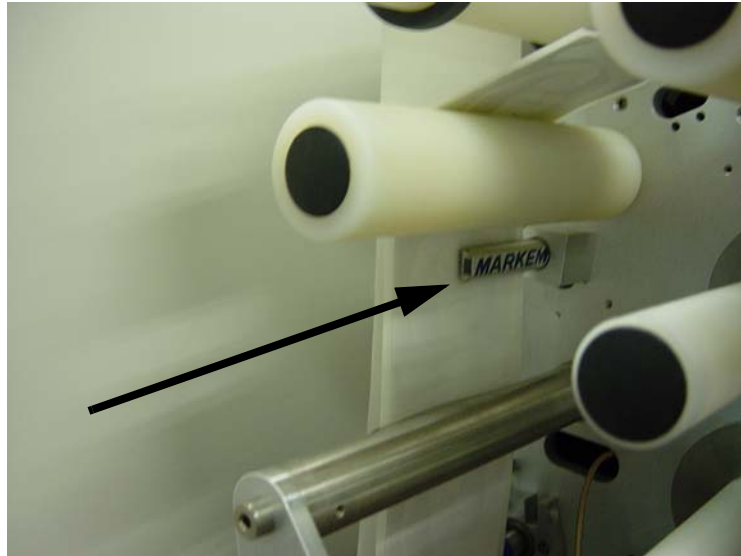
Figure 1–4 Cimjet RFID - Tag Optic

3.3 Beacon Light (Optional)

The beacon light is situated in a prominent position on the Cimjet RFID. The beacon has a three light system: green, blue, yellow.

- When the yellow light is on, the Cimjet RFID has switched out of **Auto Mode** (to **Set Mode**) or there is a fault on the machine
- When the green light is on, Cimjet RFID   is awaiting a signal to start the **Program, Verify, Reject, Apply** sequence
- When the blue light is on, the tag is programmed successfully and is ready to carry out the apply process

3.4 Networking

Cimjet RFID provides options for communicating with PCs and other computers. The methods available are:

- A Serial link to a single PC
- Ethernet link

4.0   Dimensional Drawings (in Millimeters)

Mounting Hole
Pattern Detail

36 □

6.1 Diameter
Clearance x 3

192

164

7

164

226

390

508

164

164

520

120

190/235

230/275
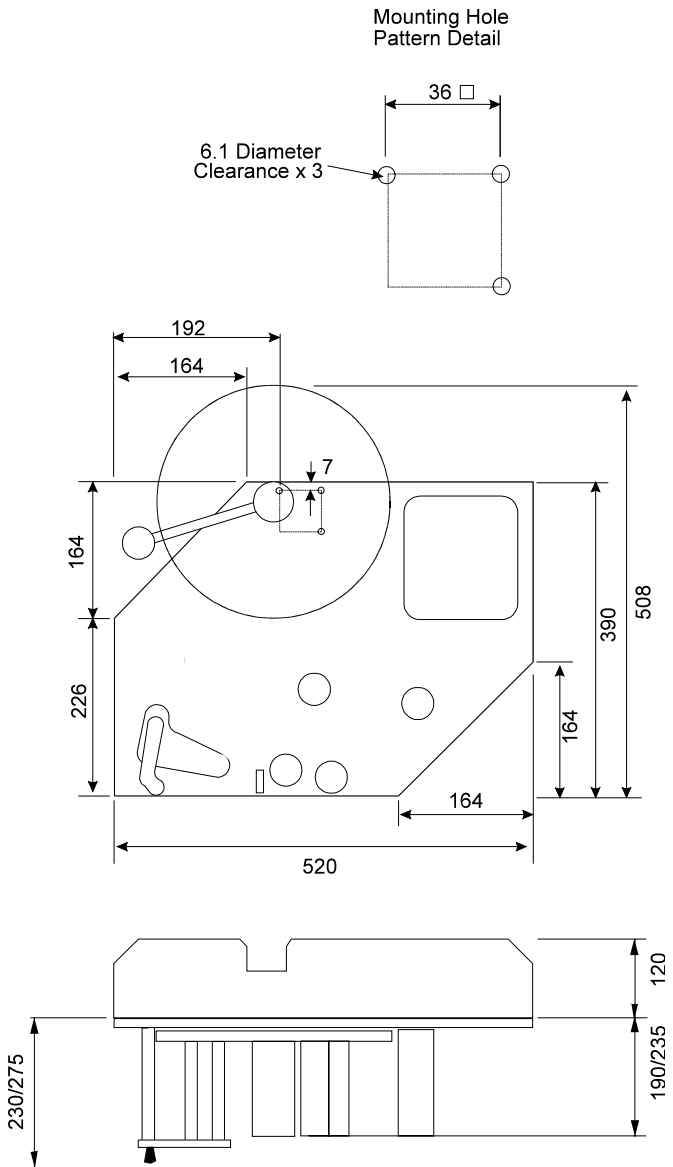
Figure 1–5 Cimjet RFID - Dispenser (applicator not shown)
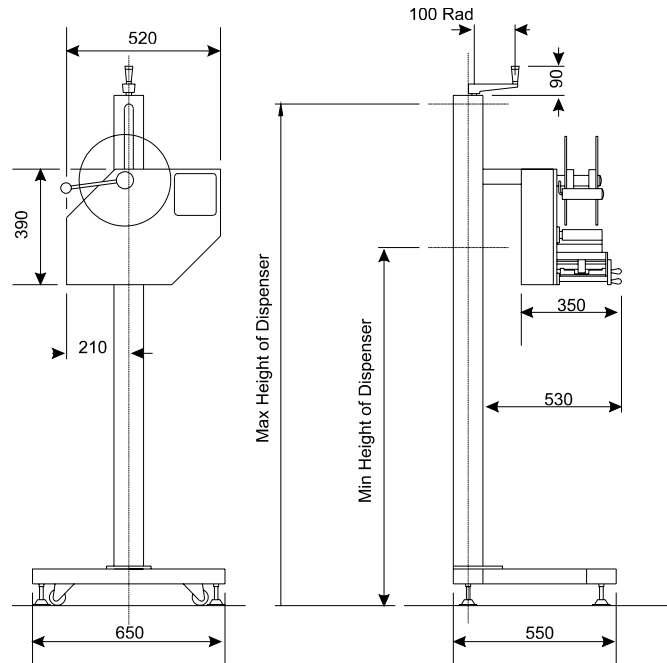
Figure 1–6 Cimjet RFID - Dispenser Stand

SECTION 2

Installation Guide

1.0   Installation of the Cimjet RFID

Installation should only be performed by qualified and trained personnel; customer installation should be sanctioned by MARKEM.

WARNING: Failure to perform installation as stated above will invalidate the machine warranty.

1.1   Installation Requirements

Ensure that the required services and control signals are available:

- Power: 110-240V single phase power supply rated at 300VA continuous (750VA maximum at switch on)
- Compressed air: a dry, clean, non-lubricated air supply at 6.2 Bar (90psi)
- Trigger signals depending on the application
- Sufficient space for installation and operation

WARNING: All applicator cylinders have been factory-set to 1.86 Bar for safety. If the cylinders are operated over 1.86 Bar, the machine must be protected by guarding, supplied by the customer.

SAFETY: Do not adjust the applicator regulator pressure above 1.86 Bar under any circumstances. Doing so could make the Cimjet RFID unsafe.

CAUTION: It is essential that the connector dust covers provided with the machine are fitted to all unused connectors to protect against dust and dirt and prevent possible static damage to internal components.

2.0 Power

The power connector (Type STASEI2) is supplied with the machine and conforms to EC regulations.

2.1 Power Configuration

Before installing the machine, check that the power supply is correctly configured.

The power supply is configured by:

- Power connections to the toroidal transformer located at the rear of the machine
- Fitting of the corresponding fuse

Details of this procedure are given in **Section 7 - Technical Information**.
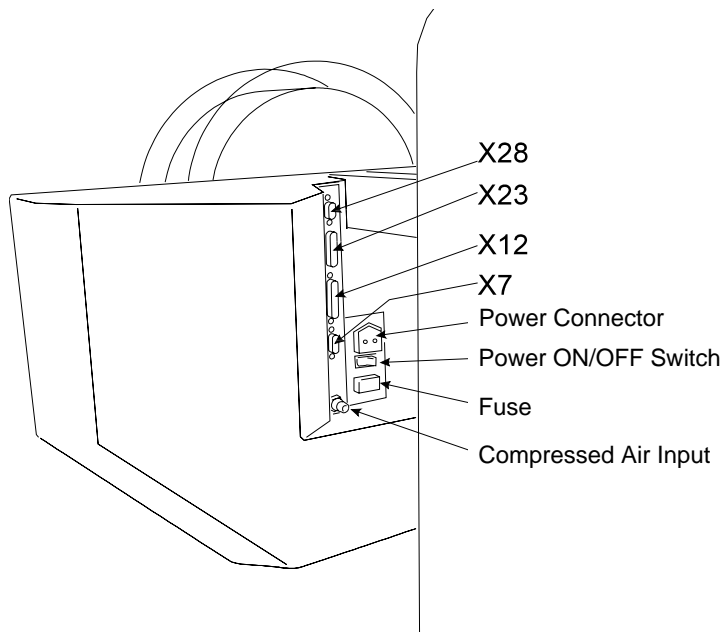
Figure 2–1 External Connectors

For full details of electrical connections, see **Section 7 – Technical Information** and **Section 10 – Parts Illustrations and Electrical Schematics**.

3.0 Air Requirements

A compressed air supply is normally required by the Cimjet RFID to drive the applicator module. This must be set to 6.2 Bar (90psi) with a minimum flow rate of 4cfm (cubic feet per minute) (113 liters/minute) and should be dry, uncontaminated air which should not be lubricated.

3.1 Air Regulator

A filter regulator assembly is fitted to the base of the stand; this is comprised of a manual isolation valve, a water trap and pressure regulator. The air supply is via a 6mm or 8mm flexible pipe.

A single connection is supplied to the main filter regulator unit; from here, the regulated supply goes to the applicator (if air operated) and the unregulated supply goes to the air input on the dispenser.
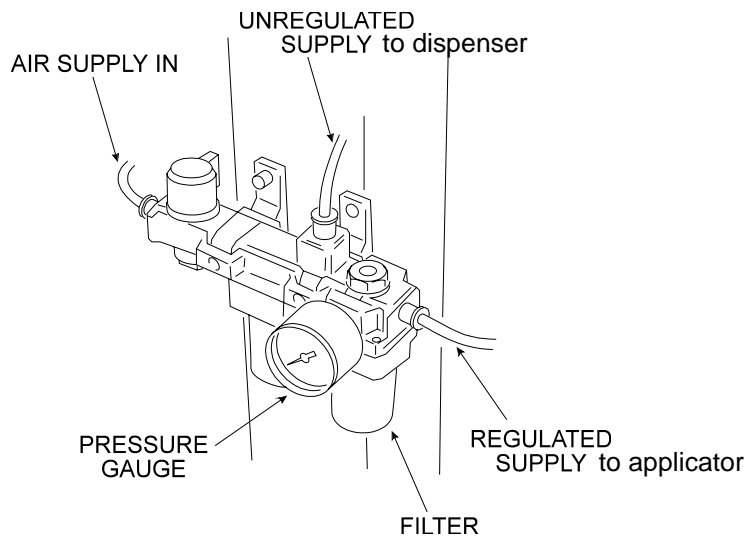
4.0   I/O Interface

Connections for all sensors and solenoids are accessed by removing the rear cover. External I/O is connected via the External I/O connector (25-way D-type connector (X12)) located on the rear of the Cimjet RFID.

For full details, see **Section 7– Technical Information**.

5.0   Positioning the Applicator

The Cimjet RFID is normally supplied with a stand which allows the positioned tag height on the product to be adjusted within a limited range. The applicator height will be determined by the conveyor height and required position of the tag on the product.

Leveling feet are not provided as standard, so care should be taken to align the machine with the product transportation system.

Before final positioning, the machine should be placed so that the applicator arm is square to the product and the position of the machine provides the correct tag position on the product.

CAUTION: If the machine is not secured to the floor, it is possible for the machine to gradually change position during use. It is, therefore, important to mark the provisional position of the machine prior to starting tagging trials.

Installation drawings are available which show the range over which the Cimjet RFID can apply tags. Refer to the previous pages in this section and also to **Section 10 – Illustrations and Schematics**.

For more applicator information, refer to the **Cimjet RFID Blow Applicator Manual (0855906)** and the **Cimjet RFID Tamp Applicator Manual (0855907).**

SECTION 3
Operating Guide

1.0 Preparing Cimjet RFID for Operation

Installation of Cimjet RFID would normally be carried out by a qualified MARKEM service technician. This would usually involve connecting an apply sensor to the product conveyor transport system. The application cycles and type of apply sequence required would also be set up in the Cimjet RFID applicator parameters. For full details on connections, please consult **Section 7 – Technical Information**.

2.0 Operating the Cimjet RFID

Once the Cimjet RFID has been installed and checked for safety, the machine can be loaded with tags ready for use.

3.0 Loading Tags

Cimjet RFID uses inside-wound tags.

To load tags, do the following:

- Load a full tag reel onto the tag supply shaft, ensuring that the tags are facing the correct direction.
- If the tag roll does not have a lead-in with tags on it, remove approximately 1 meter (1.09 yards) of tags from the backing web.
- Manually adjust the outside guide collars on the drive rollers to accommodate the width of the tag roll. The tag roll should not rub on the collars.
- Feed the backing web around the idler rollers, between the optional post and the RF shield, around the peel bar and between the drive rollers (removal of some tags makes this easier). The optional post is provided to guide the label vertically down to the peel bar. It should be used in all cases where it does not interfere with the RF antenna placement.
- Thread the tags onto the machine, ensuring that the tags pass though the tag gap optic. **Do not** stick the tag web to the roller.
- Feed the backing web around the drive roller and secure to the waste web rewind shaft with the clip provided.
- Manually wind the web so that the tag at the peel bar is located 1mm to 3mm (0.039" x 0.118") beyond the peel edge.
- Secure the nip roller.
- Adjust the position of the RF antenna so that it is close to the RF chip in the tag. The antenna should not rub on the tag.
- The reel of tags used on this machine may be heavy. Be sure to take appropriate precautions when loading tags to prevent injury.
- An optional clear plastic disk and clamp are provided to hold the supply roll on the supply shaft.
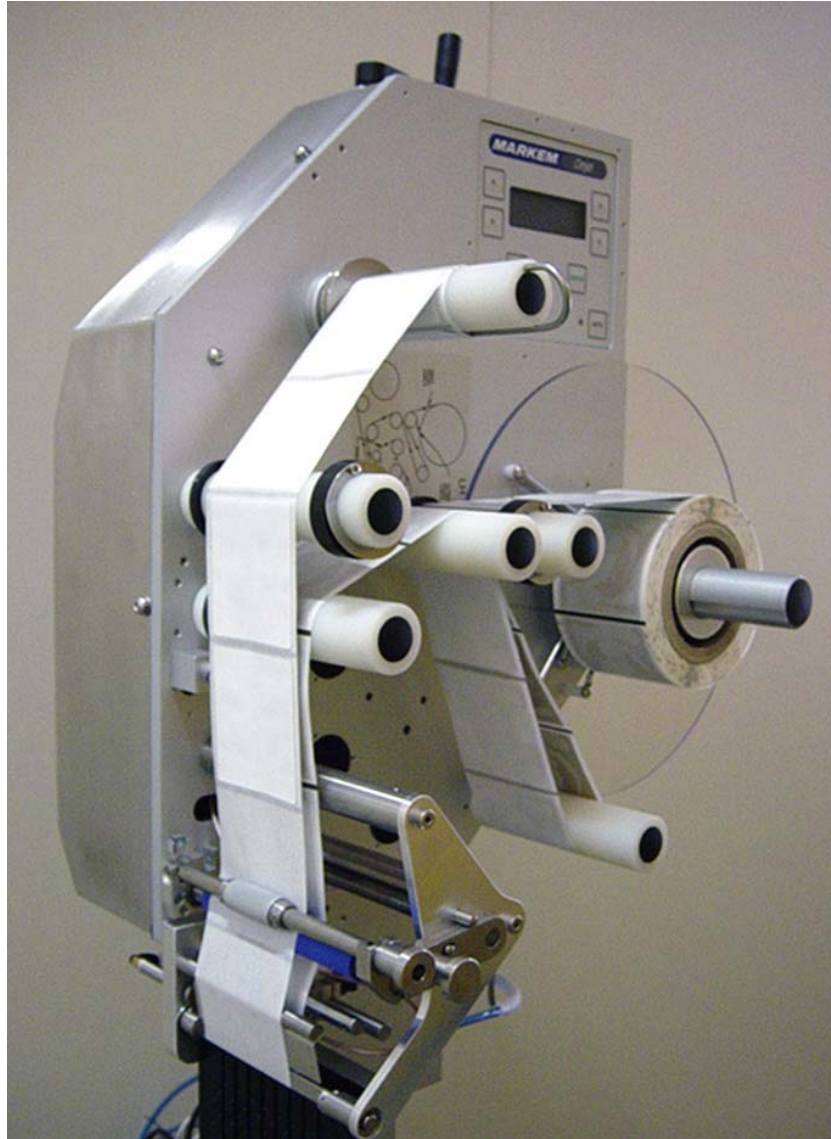
Figure 3–1 Webbing Diagram (left-hand option shown)

4.0 Power-up

To prepare the machine for use:

- To turn the air supply ON; rotate the air supply control valve handle.
- Check that tags are correctly loaded and that the nip roller is latched in position.

WARNING: **Be aware that free items, such as loose clothing or long hair, could become entangled or trapped in the tag nip roller or paper path during the operation of the machine. A warning sticker highlights the hazard.**

- Make sure that the power cable is connected, and switch on the power at the rear of the machine.
- During power-up, the user interface defaults to **Set Mode** and displays the current software version.
- Press **AUTO.**
- The Cimjet RFID automatically feeds Datum tags to set the correct tag stop position and measure the length of the tags in use. The number of tags varies with software versions.

The message: **REMOVE DATUM TAGS, THEN PRESS AUTO** is displayed on the user interface. To continue:

- Remove the tags.
- Press **AUTO.**

The Cimjet RFID is now ready to operate.

5.0   Operator Interface

5.1   Menu Operation

The control panel (user interface) provides:

- Machine setup and fault finding
- Error and Warning Messages

5.2   The Control Panel

This drawing is a representation and is not to scale.
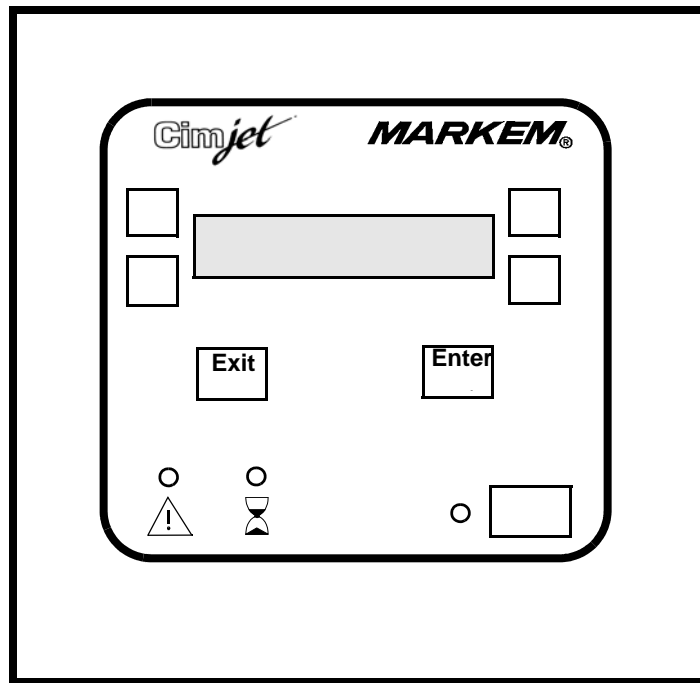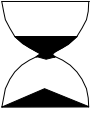
- Four option soft keys
- Liquid Crystal Display (LCD) with 4 lines of 20 characters
- Three fixed keys: **EXIT, ENTER,** and **AUTO**

5.3 Operator Interface LEDs

Three LEDs provide a visual indication of machine status.

LED	Description
Mode LED	Indicates if the machine is in **Auto** or **Set Mode** **Green LED**: **Auto Mode** **Red LED**: **Set Mode**
Machine Busy LED	**Yellow LED**: Cimjet RFID is feeding or applying in **Auto Mode**
Status LED	**Green LED**: Machine OK **Amber / Yellow LED**: Warning, such as low paper **Red LED**: Fault, such as no tags

5.4 Guidelines for Entering Data

Many of the screens in both **Auto** and **Set Mode** require the operator to enter information using the menu.

To select an option:

• Press the 'soft key' next to the required option.

NEXT and PREVIOUS

Generally only one parameter can be displayed on the screen at one time.

To scroll through available options:

• Press **NEXT** to view the next available parameter

• Press **PREVIOUS** to view the previous available parameter

Saving and Discarding Changes

The method of saving and discarding changes depends on the particular screen. Generally, to save changes:

• Press **ENTER**; the new parameter value is saved

To discard changes and retain the previous value:

• Press **EXIT**

Also press **EXIT** to step back up through the menu structure.

6.0   Auto and Set Mode

The Cimjet RFID has two modes of operation:

- **Auto Mode**

Cimjet RFID automatically responds to **Apply** signals. **Application** is triggered by sensors or other inputs. For further details, refer to the Cimjet RFID **Section 7-Technical Information**.

- **Set Mode**

This mode provides a series of menus which allow you to:

    a) Run diagnostic tests

    b) Control applicator parameters such as apply delays, etc.

    c) Set the time and date

Fixed Keys

- ENTER

- EXIT

- AUTO

    This **AUTO** key is used in place of a keyswitch and toggles Cimjet RFID between **Auto** and **Set Mode**.

6.1   Auto Mode

In **Auto Mode**, Cimjet RFID automatically applies tags.

Application is triggered by sensors or other inputs such as PLC control. For details, refer to the Cimjet RFID **Section 7-Technical Information.**
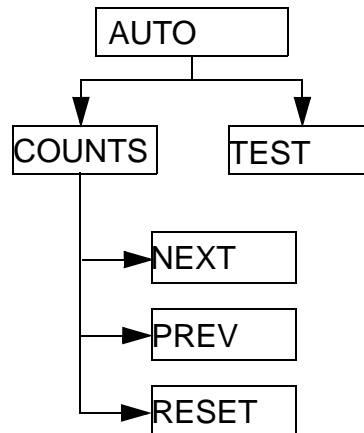
Figure 3–2 Auto Mode Menu Tree

To select **Auto Mode**:

• Press **AUTO**

The **Auto Mode** LED is green and the following LCD screen is displayed:
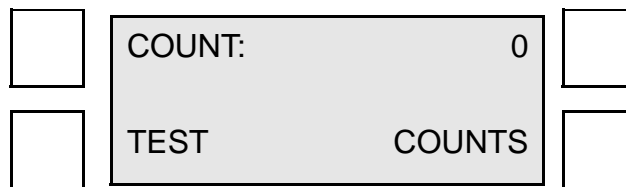
6.2 Set Mode

In **Set Mode**, Cimjet RFID does **NOT** respond to **Apply** requests.
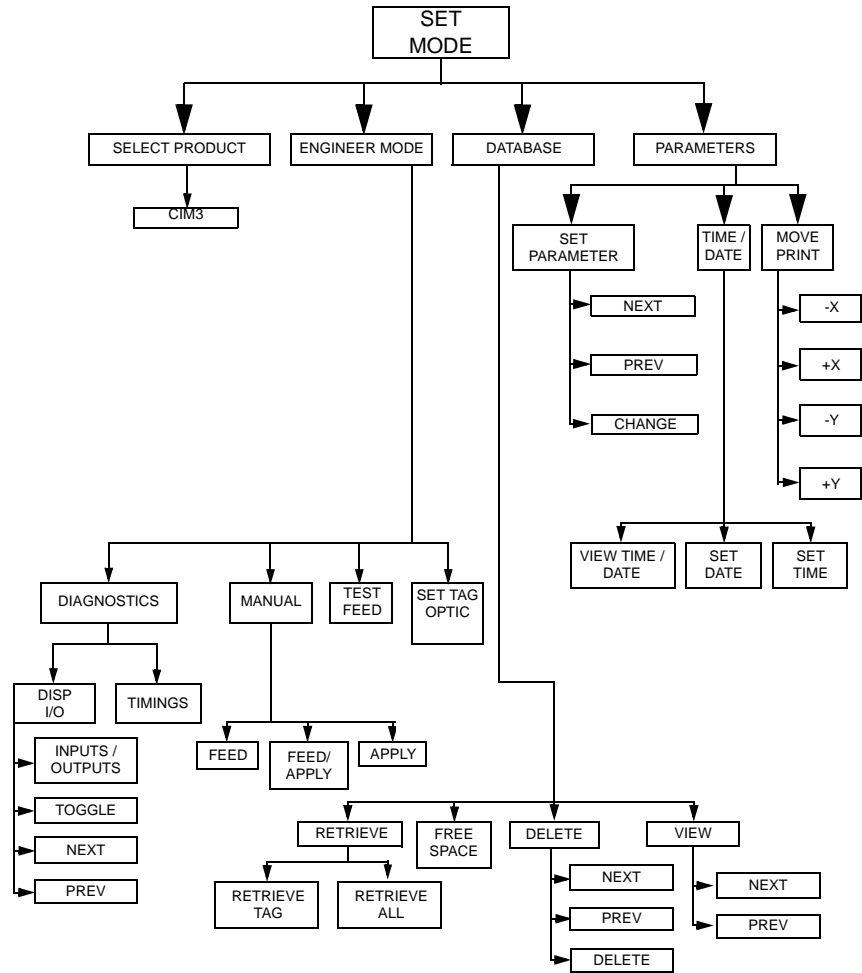
Figure 3–3 Set Mode Menu Tree

Set Mode provides a series of menus which allow you to:

- Run diagnostic tests
- Control applicator parameters
- Set the time and date

Cimjet RFID has a further level of restricted access menus, which give access to other infrequently changed parameters. For further information, see **Section 4 - Restricted Access Mode User Guide**.

To select **Set Mode**:

- Press **AUTO**

The display shows the four main options available:

```
┌──┐  ┌───────────────────────────┐  ┌──┐
│  │  │ SELECT          ENGINEER  │  │  │
└──┘  │ PRODUCT             MODE  │  └──┘
┌──┐  │                           │  ┌──┐
│  │  │ DATABASE      PARAMETERS  │  │  │
└──┘  └───────────────────────────┘  └──┘
```
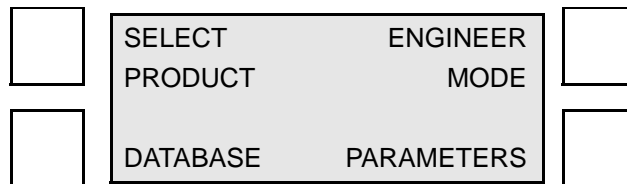
7.0   Engineer Mode

These options provide a number of first line machine maintenance functions:

```
┌───┐  ┌──────────────────────────┐  ┌───┐
│   │  │ DIAGNOSTICS      MANUAL  │  │   │
└───┘  │                          │  └───┘
┌───┐  │                          │  ┌───┐
│   │  │ TEST             SET TAG │  │   │
└───┘  └──────────────────────────┘  └───┘
```
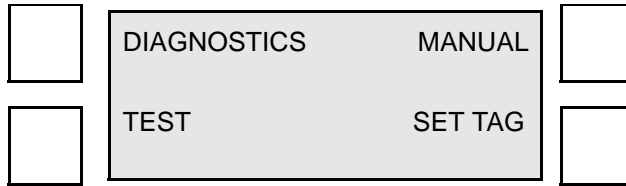
7.1   Diagnostics

```
┌───┐  ┌──────────────────────────┐  ┌───┐
│   │  │ DISP I/O         TIMINGS │  │   │
└───┘  │                          │  └───┘
┌───┐  │                          │  ┌───┐
│   │  │                          │  │   │
└───┘  └──────────────────────────┘  └───┘
```
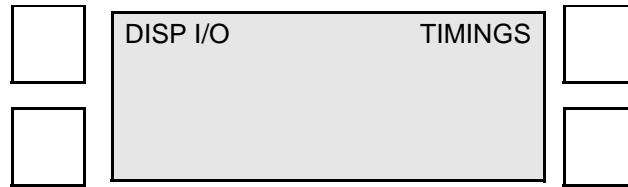
Disp I/O

This screen allows the operator to view the current status of the Cimjet RFID inputs and to test the various Cimjet RFID Outputs.

Full details can be found in **Section 7 – Technical Information**.

7.2   Set Tag Optic

Cimjet RFID feeds tags to automatically determine the optimum setting for the tag sensor. This function can be used, if for example, different tag stock is used.

8.0   Parameters

This option allows the operator to alter various operating parameters:

```
TIME/                        SET
DATE                  PARAMETERS
```

Time / Date

```
VIEW TIME/DATE


SET                          SET
TIME                        DATE
```

•   Enter the required date and time

Time is entered in the 24-hour format.

Set Parameters

This lists the **Set Parameters** available to view and/or change. Other parameters are also available; for further information, refer to **Section 4 - Restricted Access Mode User Guide**.

Table 3–1

Parameter	Description
Apply Delay **25**	This parameter allows the application of the tag onto the package to be delayed. It is used for positioning.
Darkness* **100**	
Feed Speed **Range: *50-250mm/s*** **Default: *15 0mm/s***	Feed speed (mm/s) is the time taken for the tag to pass the nip roll.
Direction* **0**	

*Does not apply to Cimjet RFID

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SECTION 4

Restricted Access Mode User Guide

SECTION 4 Restricted Access Mode User Guide

1.0   Restricted Access Mode User Guide

The **Restricted Access Mode** in Cimjet RFID, has a series of menus. These menus allow the configuration to be altered.

CAUTION: The accessed parameters should only require changing directly after installation. Access parameters must be changed by qualified MARKEM personnel or under close instruction from MARKEM.

2.0   Entering Restricted Access Mode

To enter **Restricted Access Mode**:

•   Select **Set Mode**

•   Press and hold the **ENTER** and **EXIT** keys

After approximately five seconds, the restricted access main menu appears. Release the **EXIT** key first.

The restricted access main menu has four main options:

```
RESTRICTED       MACHINE
SETUP                 INIT


PASSWORD          CYCLE
```
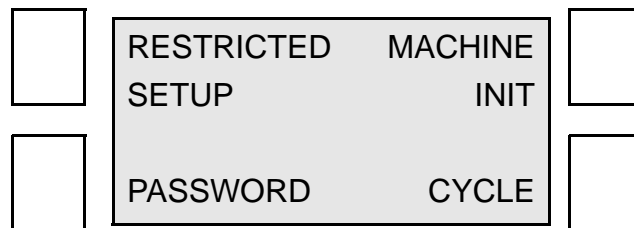
•   Restricted Setup
•   Machine Init (Initialization)
•   Password
•   Cycle

Further details on these menus can be found on the following pages.

3.0 Machine Init (Initialization)

From the main menu:

```
RESTRICTED      MACHINE
SETUP              INIT


PASSWORD         CYCLE
```
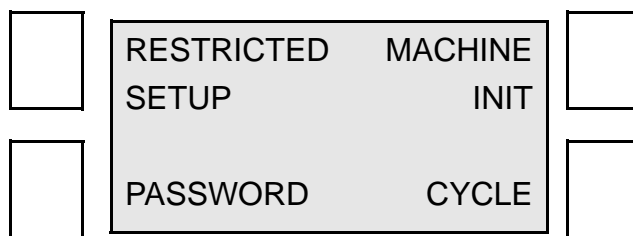
- Press **MACHINE INIT**

The Machine Init menu is displayed:

```
RESET            CLEAR
PARAMS        DATABASE
                 CLEAR
COUNTS      FLASH FILE
```
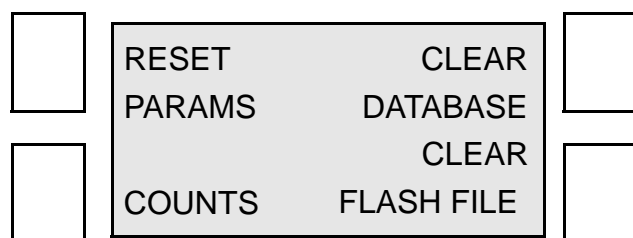
3.1 Reset Params

This option resets all parameters to their default values. The current selected applicator is not changed, but the applicator parameters are set to the corresponding default values.

From the **Machine Init** menu:

- Press **RESET PARAMS**

The following screen is displayed:

```
    RESET PARAMETERS
     ARE YOU SURE?


YES                 NO
```
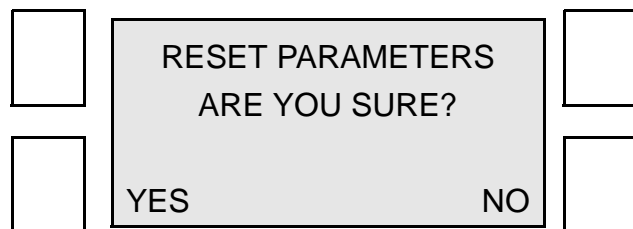
SECTION 4 Restricted Access Mode User Guide

4.0   Password

Cimjet RFID can have password protection of the various **Set Mode** functions.

Passwords are entered using the four soft keys. These keys are:

```
┌───┐  ┌──────────────────┐  ┌───┐
│ 1 │  │                  │  │ 2 │
└───┘  │                  │  └───┘
┌───┐  │                  │  ┌───┐
│ 3 │  │                  │  │ 4 │
└───┘  └──────────────────┘  └───┘
```

An asterik (*) will be displayed for each digit entered, and the **ENTER** key should be pressed when the complete password has been typed.

The passwords for each access level are fixed. The key sequences are given on the last page of this section. This page may be removed if passwords are being used, and if this manual is freely available.

When a password is enabled for a key, Cimjet RFID will request entry of the key sequence before allowing access to the option. The four levels are for access by different user types:

- Level 1 - Operators
- Level 2 - Line Supervisors
- Level 3 - Maintenance Personnel
- SYSTEM - MARKEM Personnel and Line Managers

4.1   Password Configuration

On selection of the **PASSWORD** option from the top level restricted access menu, the following screen is displayed:

```
                        CHANGE
              LEVEL 1

              - ----
   NEXT               PREVIOUS
```
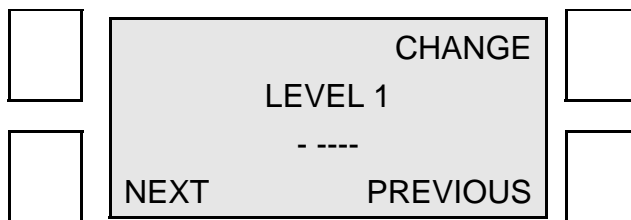
• Select **CHANGE**; the following screen is displayed:

```
   ENABLE          DISABLE
              LEVEL 1

              - ----
      ←                  →
```
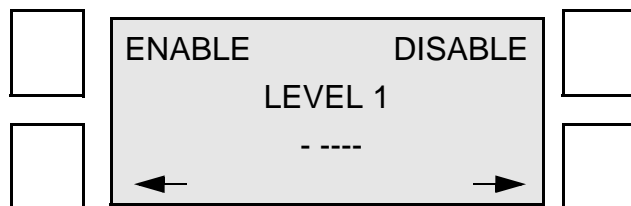
The **NEXT** and **PREVIOUS** keys are used to scroll through the four access levels.

To activate a specific button on any level, press **ENABLE** with the cursor flashing on the required function (- E---) indicates which functions are available to users of this password level.
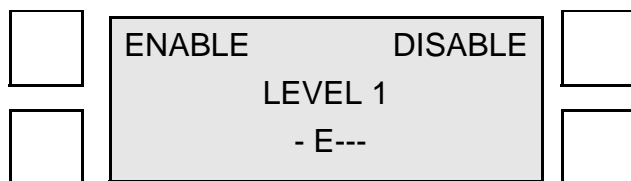
```
   ENABLE          DISABLE
              LEVEL 1
              - E---
```

In the above example, LEVEL 1 has access, via the level 1 password, to the **SELECT PRODUCT** option (**Button 1**).

The underscores on the screen indicate which function button is associated with the button numbers shown at the beginning of this section.

For example, reading from left to right, the first underscore activates the **Restricted Setup** buttons (**ENTER** and **EXIT** pressed at the same time). The next underscores are buttons **1, 2, 3,** and **4.**

Access to the other soft keys and restricted access mode will depend on the other users' protection level.

If all users have a '-' for a particular key (or restricted access), then no password protection will exist on that key.

The protection level for the particular user may then be changed using the soft keys.

Note: The SYSTEM password, when active, will allow access to change the password settings.

4.2   Password Key Sequences

The **Key** sequences for each access level are fixed and are as follows:

- Level 1   –   2-1-1-1
- Level 2   –   2-3-3-1
- Level 3   –   4-1-2-3
- System 4 –   2-4-4-1

CAUTION: If you have password protection to restricted access mode, the SYSTEM user will automatically have access to this mode regardless of the SYSTEM password configuration. The SYSTEM user will be the only user with access to the password configuration menus.

Note: Remove this page if this manual is in common circulation and passwords are in use.

5.0 Cycle

This cycle option allows the various elements of the machine to be set into continuous operation (for example: to continuously cycle the Cimjet RFID unit).

See the main menu below:

```
┌─────────────────────────────┐
│ RESTRICTED       MACHINE    │
│ SETUP               INIT    │
│                             │
│                             │
│ PASSWORD          CYCLE     │
└─────────────────────────────┘
```
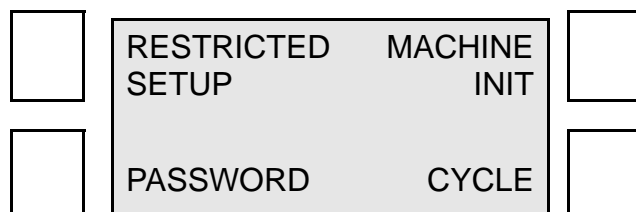
• Select **CYCLE**; the following screen is displayed:

```
┌─────────────────────────────┐
│ FEED              APPLY      │
│           CYCLE             │
│         CYCLES/MIN          │
│ FEED/APPLY         FEED      │
└─────────────────────────────┘
```
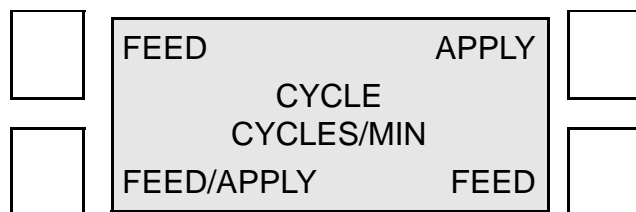
To start a cycle:

• Press the required soft key

To stop the cycle:

• Press the required soft key again

6.0   Restricted Setup

From the main menu:

- Press **RESTRICTED SETUP**

The following screen is displayed:

```
SET NODES


SET                SELECT
PARAMETERS LANGUAGE
```
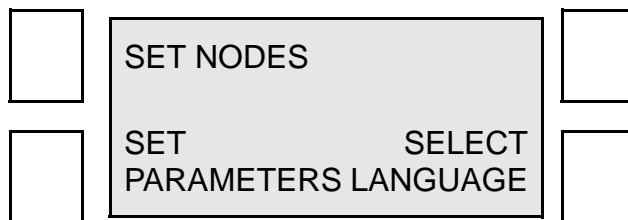
7.0   Set Parameters

This option allows various parameters to be viewed and changed.

From **Restricted Setup** menu:

- Press **SET PARAMETERS**

The **Set Parameters** screen is displayed:

```
FEEDER            COMMS.


MACHINE
OPTIONS              TAG
```
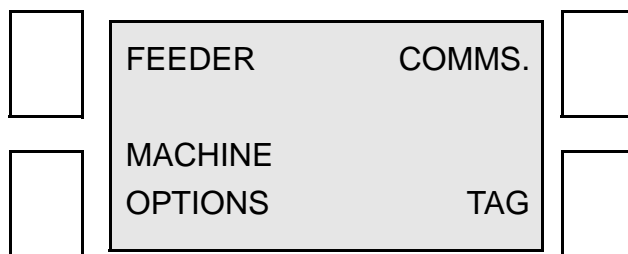
The operator can change:

- Feeder Parameters
- Communications Parameters
- Machine Options

8.0   Communications Parameters

These parameters configure the **Communications** port.

From the **Set Parameters** screen:

- Press **COMMS**

```
FEEDER                    COMMS.

MACHINE
OPTIONS                      TAG
```

The first parameter is displayed:

```
                        CHANGE
              EMULATION MODE
                   CIMCOMMS
NEXT                  PREVIOUS
```
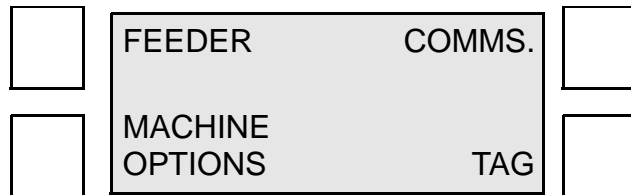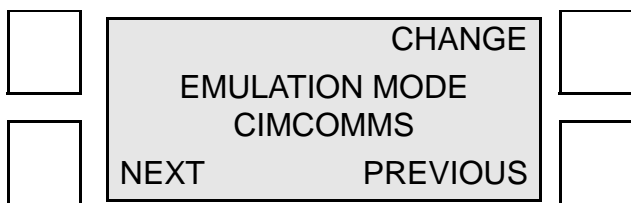
- Press **CHANGE** to select a different option

See the following table for a full list of available communications parameters.

Table 4–1 Communications Parameters

Parameter	Description
Emulation Mode Range: *CIMCOMMS,* *EMULATION Z or S* Default: *CIMCOMMS*	Determines whether the Cimjet RFID Host communication channel is set to respond to **CIMCOMMS** protocol or desktop **EMULATION** protocol
Comms Baud **Range: 2400, 4800, 9600,** **19200, 38400, 57600, 115200** **Default : 19200**	Host communications link baud rate
Comms Link **Range: RS232** **ETHERNET** **Default: RS232**	Host communication link type
Comms Mode **Range: *LOCAL, SLAVE*** **Default: *LOCAL***	In SLAVE mode, the Cimjet RFID responds to remote product select commands
Network Node* **Range: *1 to 31*** **Default: *1 (RS232 operation)***	
Transfer Timeout **Range: *30 seconds to 10 minutes*** **Default: *30 seconds***	This allows the download transfer timeout to be increased

*Does not apply to Cimjet RFID

SECTION 4 Restricted Access Mode User Guide

9.0   Machine Options Parameters

These parameters configure the machine options available.

From the **Set Parameters** screen:

• Press **MACHINE OPTIONS**

```
┌───┐  ┌──────────────────────┐  ┌───┐
│   │  │ FEEDER        COMMS   │  │   │
└───┘  │                      │  └───┘
┌───┐  │ MACHINE              │  ┌───┐
│   │  │ OPTIONS          TAG │  │   │
└───┘  └──────────────────────┘  └───┘
```

The following screen is displayed:

```
┌───┐  ┌──────────────────────┐  ┌───┐
│   │  │ APPLICATOR           │  │   │
└───┘  │                      │  └───┘
┌───┐  │ MACHINE              │  ┌───┐
│   │  │ CONFIG               │  │   │
└───┘  └──────────────────────┘  └───┘
```
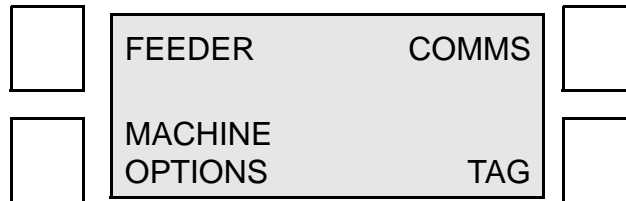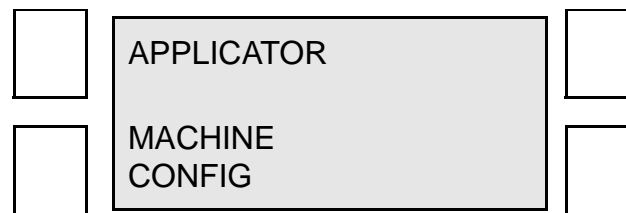
This screen provides access to:

• Applicator Parameters
• Machine Options
• Laser Setup Parameters

9.1 Machine Configuration Parameters

These parameters configure various machine setup options:

From the **Machine Option** screen:

- Press **MACHINE CONFIG**

```
APPLICATOR


MACHINE
CONFIG
```

The first parameter is displayed:

```
                        CHANGE
              MACHINE TYPE
               CIMJET RFID
NEXT                 PREVIOUS
```
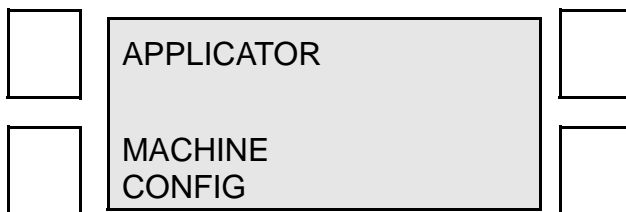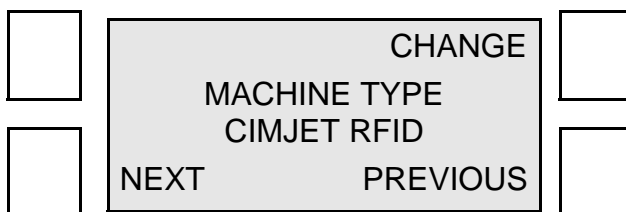
The options can be accessed by using the **NEXT** and **PREVIOUS** soft keys.

Table 4–2 Machine Configuration Parameters

Parameter	Description
Machine Type Range RFID: *306, 311, 312, 313, 314P, 316, 321, 331, 334, 342, 344, 345, 346, 2112, 2113, 2132, 2341, 2422, Cimpak 300* Default: *RFID*	These options are for the Cimjet series machines and define the Applicator type fitted.
Database Mode Range: *LOCAL RAM, Host PC* Default: *LOCAL RAM*	Cimjet RFID has two methods of product selection: **Local RAM Mode**: Cimjet RFID selects tags resident in the local memory **Host PC Mode**: Cimjet RFID requests the required data from the Host PC
Sensor Debounce Range: *0 to 2000* Default: *0*	Delays the response to external sensors This is useful, for example, if the shrink wrap on a product is causing the product sensor to trigger a number of times for each pack. By setting a higher **Sensor Debounce** value, Cimjet RFID only responds to signals that stay on or off for the debounce time.
Enable Counts in Run Range: *Yes, No* Default: *Yes*	Allows the product counts to be displayed on the **RUN Mode** screen.
Test In Run Range: *Yes, No* Default: *Yes*	Most applicators provide a **TEST** option in **RUN Mode** that allows a tag to be fed without an external signal. Set to **No** to disable this function.

Table 4–2 Machine Configuration Parameters

Parameter	Description
Allocation Warning Range: *Off, On* Default: *Off*	If set to **On**, a warning is displayed when an allocation runs out.
Measurement Units Range: *Metric, Imperial* Default: *Metric*	Style in which measurements are displayed, either Metric or Imperial
Filter Select Range: *Off, On* Default: *Off*	If set to **On**, it allows operator to search for a product using a filter. Example: first letter of the product name **A*** or **3*** Only product names beginning with **A** or **3** will be displayed.
Allocation Abort Range: *On, Off* Default: *Off*	An allocation set from CimControl® can be stopped before it is completed.
Log Feed Data* Range: *No, To File, Realtime* Default: *No*	
Status Output Range: *None, Apply complete or Cycle complete* Default: *None*	Used with external control systems
Status Output Reset Range: *Product Select/UD, Apply, Reset Input* Default: *Product Select/UD*	This determines which function will be used to reset the **Status Output.**
CimComms Status Reset Range: *Product Select/UD, Apply, Reset Input* Default: *Product Select/UD*	This determines which function will be used to reset the **CimComms Status Word**. Used with either Cimcomms or ASCII Comms status messages

Table 4–2 Machine Configuration Parameters

Parameter	Description
Compatibility Mode Range: *On or Off* Default: *On*	This determines if the **CimComms Status Reset** function is used or not.
Product Select Input* Range: *On, Off* Default: *Off*	
Key Beep Range: *Yes, No* Default: *No*	When a key is pressed, a 'beep' noise is produced.

Note: For full information on the last five parameters, please see **Section 7 – Technical Information**.

*Does not apply to Cimjet RFID

9.2   Applicator Parameters

These parameters configure various applicator setup parameters.

**Table 4–3 Restricted Setup/Set Parameters/Machine Options/
Applicator**

Parameter	Description
Operation Mode Default: On-demand	Selects from **Auto Apply, Pre-fed,** and **On-demand** Mode. These modes are described in **Section 2**.
Blow Time Default: 50	Sets the duration of the blow used to apply the tag. This should be kept as short as possible while maintaining reliable tag application. It is recommended that the **Blow Time** is on for the time it takes the tag to blow from the grill to the product.
Settling Time Default: 0	This parameter is used to allow the tag to settle to the applicator grill before the tag is applied to the product.
Apply Delay Default: 25	This parameter allows the application of the tag onto the pack to be delayed. Used for positioning.
Head Lift Delay Default: 140	On Cimjet RFID, this is used to time the cylinder for the reject mechanism.
Op Vacuum Delay* Default: 100	

*Does not apply to Cimjet RFID

10.0   Feeder Parameters

These parameters configure options in the Cimjet RFID for tag adjustment, motor speed, and optic sensor position.

Table 4–4 Restricted Setup/Set Parameters/Feeder

Parameter	Description
Darkness %* Default: 100	
Backfeed Speed* Default: 150	
Feed Adjust Default: -50	Adjusts the position of the leading edge of the tag on the peel edge
Backfeed Default: 0	Backfeed must remain at 0 for Cimjet RFID.
Ribbon Sensor*	
Feed Speed Default: 150	Feed Speed (mm/s) is the time taken for the tag to pass the nip roll.
Optic Position Default: NEW	Sensor location prevents tag gap from stopping in front of sensor (refer to **Section 6, paragraph 3.0**).
Optic Adjust Default: 0	If the tag gap happens to stop in the **Tag Gap** sensor, this will cause feed problems. In cases where this happens, the **Tag Gap** sensor can be moved to a new position 10mm (.394") lower. The **Optic Adjust** parameter should then be adjusted by -100 to compensate. **NOTE:** This parameter should not be adjusted for any other reason.
Direction* Default: 0	
Ribbon Save* Default: None	

Table 4–4 Restricted Setup/Set Parameters/Feeder

Parameter	Description
Feeder Hand Range: *LEFT,* *RIGHT* Default: *LEFT*	Defines on which side of the feeder the image is aligned

*Does not apply to Cimjet RFID

SECTION 5

Operating Modes

1.0   Operating Modes

The Cimjet RFID can be fitted with various applicator modules to suit specific applications. The application may require that tags be applied to the top, front, side, front and side or top and side of the product packs.

The type of application required and the number of packs/minute will determine which style of applicator is best suited for the job.

In most cases, the **Apply** sequence is triggered by a sensor mounted on the transport conveyor.

In some special applications, the **Apply** sensor may be dispensed with and the required functions performed using a serial communications link.

Three factors determine the position of the tag on the pack:

- The position of the applicator relative to the conveyor
- The position of the sensor
- The setting of the **Apply Delay** timer

Any one of these factors can affect the position of the tag placement in the direction of the product motion.

A suitable combination of these factors must be determined.

Note: The machine should, in most cases, be mounted square to the products.

2.0   Application Cycle

Three options are normally available, depending on the applicator being used:

Auto Apply: **Feed** sensor only

Pre-feed: **Apply** sensor only

On Demand: **Feed** sensor and **Apply** sensor

Note: Feed and **Apply** sensors will only be operational when the **Run Mode** is implemented, and the dispenser positions the applicator to its **Home** position.

2.1 Auto Apply Mode

The dispenser detects a product by using the **Feed** sensor, and begins to feed a tag.

During feed, an air assist jet is used to ensure that the tag comes into contact with the applicator apply mechanism.

The applicator may be in the form of a vacuum pad or belt-driven applicator.

When the feed is completed, the air assist jets hold the tag to the applicator.

The applicator waits for the apply delay timer to elapse, then activates the apply mechanism

Note: No **Apply** sensor is used.

2.2 On Demand Mode

In this case, the sequence is similar to **Auto Apply**, except that this time both **Feed** and **Apply** signals are used.

The **Feed** sensor is activated and the tag is fed onto the applicator.

After the tag is dispensed, Cimjet waits for the **Apply** signal.

The **Apply** sensor is activated; the applicator waits for the apply delay timer to elapse, and then it applies the tag.

3.0   Connecting External Sensors

3.1   Wiring the Sensors

The **Feed** and **Apply** sensors are connected to Cimjet RFID via the 9 pin D type connector **X23** on the rear of the machine.

Depending upon the installation, different wiring configurations can be used.

In **simple applications** using only **Feed** and **Apply** sensors, wire the sensors directly to **X23**.

In **more complex applications** that require a number of connections to X23, it is recommended that a single multi-core cable be run in conduit to a junction box. The junction box can be mounted at a convenient position and individual cables run to the sensors and conveyor control, etc.

For full connection details, refer to **Section 7 – Technical Information**.

3.2   Testing the Sensors

Viewing the status of the inputs in the **Engineer Mode Diagnostic** screen will test the functionality of the sensors. Take the Cimjet out of **Auto Mode**; depress the **Engineer Mode** button, then depress the **Display I/O** button. The status of the inputs can then be seen.

Passing an object in front of the sensor should cause the status to change from **OFF** to **ON**.

4.0 Positioning Sensors

Depending on the mode of operation, **set via the Restricted Parameters menu**, the Cimjet RFID can use a combination of **Feed** sensor only, **Apply** sensor only, or both **Feed** sensor and **Apply** sensor.

The sensors must be positioned correctly to obtain the best possible results. **Different considerations are required for different operation modes.**

4.1 Auto Apply Sensor Position

This mode is useful for applications where the line speed and pack spacing are constant, and the **Apply** sensor is not required.

In this mode, the **Feed** sensor is used and the tag is applied automatically after the **Apply** delay timer has elapsed.

The **Feed** sensor should be positioned far enough away from the Cimjet applicator (prior to the tag applicator) to allow enough time for the tag to feed onto the applicator.

To achieve this, set the **Apply Delay** timer to zero and position the sensor so that the tag is firmly and fully applied to the pack as early as possible. Make sure it is applied as close as possible to the nearest edge. Use the **Apply Delay** timer to fine-tune the tag's position on the pack.

If the conveyor speed varies, the tag position may differ from pack to pack and, in extreme cases, may even miss the pack completely. This can be avoided by using **On Demand Mode**, which requires both **Feed** and **Apply** sensors.

4.2 On Demand Mode Sensor Position

This option is used when the product conveyor is constantly stopping and restarting, or sometimes slows down due to the weight of the products.

In **On Demand Mode**, a **Feed** sensor triggers the feeding of the tag and an **Apply** sensor triggers the application of the tag.

When the **Apply** sensor is triggered, Cimjet waits for the **Apply Delay Timer** to elapse and applies the tag onto the pack.

The **Apply** sensor position and the **Apply Delay** parameter setting determine the position of the tag on the pack.

The product's pitch (spacing frequency) and speed determine the position of the **Feed** sensor.

The sensor must be mounted far enough away from the Cimjet applicator (prior to the tag applicator) to allow a tag to be fed before the product reaches the applicator. If this distance is greater than the product pitch, steps must be taken to increase the feed speed or to increase the product pitch.

The **Apply** sensor should be mounted as close to the applicator as possible. This **Apply** sensor triggers the application of the tag onto the pack. The location of this sensor will set the position of the tag on the pack.

A user parameter (**Apply Delay**) may be used to delay the application of the tag, but the zero delay tag position is set by the sensor position.

5.0   Fitting the Sensors

When the optimum position of the sensors is determined, mount the sensor firmly in place.

6.0   Apply Delay

The **Apply Delay** can either be set from the **Set Mode Parameter screen** or from the **Restricted Access Mode screen.**

SECTION 6

Preventive Maintenance Guide

SECTION 6 Preventive Maintenance Guide

1.0 General Maintenance and Cleaning

For the best performance of your machine, general cleaning must be carried out as a normal part of machine use.

This section describes cleaning and maintenance procedures which will help to keep the Cimjet RFID in good working condition.

1.1 General Information

Carry out a daily general machine inspection, which should include:

- Check all guards to ensure they are correctly fitted using all required fasteners
- Check that movement is smooth and that slides and cylinders are not damaged
- Check for wear
- Check for trapped cabling and pipes
- Check for inaccurate tag placement

1.2 Positioning of Safety Labels

Labels are placed on the Cimjet RFID in various positions by MARKEM to warn of potential safety hazards. As part of regular maintenance, safety labels must be checked and replaced whenever any are missing or damaged.

Refer to **Section 1 – General Information** for further instructions or information.

2.0   Cleaning of All Rollers

When tags are fed, the tag adhesive may bleed onto the backing web. This adhesive can build up on the feed roller, tag nip, and idler rollers which may eventually cause feed problems.

To prevent these problems, the machine must be cleaned regularly using a suitable cleaning agent such as Isopropanol. Care must be taken when cleaning to prevent damage to the machine and its delicate components. Cleaning agents which will damage rubber or plastic **MUST NOT** be used. If in doubt, consult MARKEM.

It is recommended that the rollers be cleaned regularly every time the tags are replaced and before using the machine if it has not been operated for several days.

- Turn off power to the machine and remove tags
- Use a cotton swab or soft cloth, moistened in Isopropanol, to remove any residue from the feed roller and the idler rollers

Note: NEVER use abrasive materials or sharp instruments such as screwdrivers

Refer to safety information in **Section 1 – General Information** before using the Isopropanol.

3.0   Changing the Tag Size

When the tag **width** size is altered, check the following:

- Reposition all the **outer** tag guide collars to suit the new tag size; the **inner** collar position should not be moved
- Ensure that the web nip roller is in the center of the web

When the tag **height** size is altered, check the following:

- After webbing up the machine, use the **Engineer Mode** to **"set the tag optic sensor"**
- Check that the new tag size gap **does not stop** in the **Gap** sensor
- If the gap between tags does stop in the sensor, the **Gap Optic** sensor should be moved to the second hole position and the **Optic Adjust** parameter changed by minus 100 (-10mm) accordingly
- Adjust the **Feed Adjust** parameters, if necessary, to locate the front edge of the tag at the peel beak
- Adjust applicator if required

4.0   Tag Unwind Brake

A spring-loaded dancing arm and rubber friction brake band are used to control the tag supply.
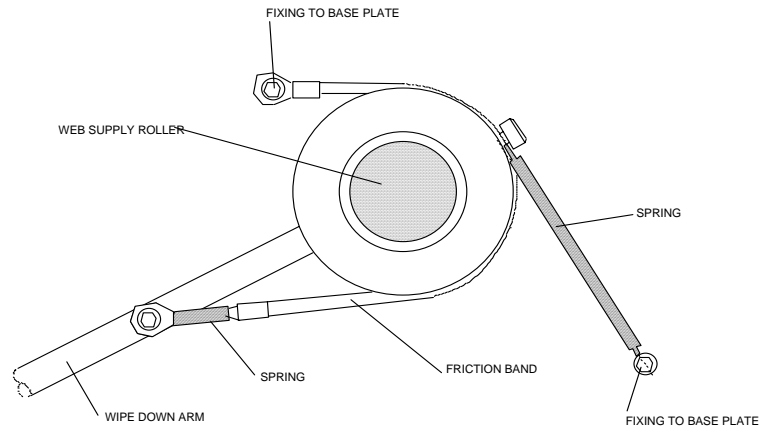
Figure 6–1 Supply Reel Brake for Inside-wound Tags

Each month, check for wear of the rubber friction brake band. If the brake band or the springs are showing signs of wear, or the brake is not operating correctly, the brake band should be replaced.

If the brake is not operating correctly, a heavy supply reel will tend to overrun and introduce slack into the tag supply path.

To replace the brake band:

- Power off the machine
- Turn and lock off the air supply
- Remove the tags from the machine
- Loosen, but do not remove, the two grub screws in the inner locking ring
- Remove the inner locking ring and the inner Perspex disk
- Unscrew the screws that secure the brake band to the dancing arm and base plate and fit the new band

5.0 Clutches

The web take-up roller uses slipping clutches to allow for the differing speeds of rotation required as the diameters of the web take-up change.

A special oiled-felt material is used to provide the best performance over a long period. However, as with any slipping clutch arrangement, the friction material must be periodically replaced.
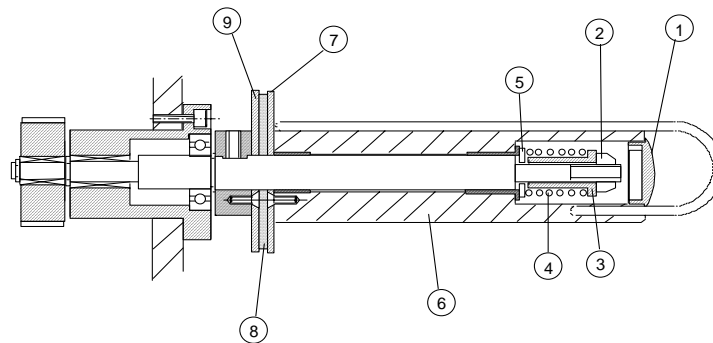
Figure 6–2 Web Rewind Roller and Clutch

The above illustration (not to scale) shows the detail of the web rewind roller and clutch.

5.1 Replacing the Felt Pads

When the clutch felt pads need replacement (between intervals of six months to one year), do the following (refer to **Figure 6-2**):

- Remove the plastic end cap (1)
- Use a box spanner (deep socket nut driver) (10mm A/F) to remove the nut (2)
- Remove spring (4), spacer (3) and washer (5); do not lose or drop these items as they are being removed
- Remove the roller (6) and outer clutch plate (7) by sliding off the central shaft
- Remove the felt washer (8)
- Replace with a new felt washer from the spares kit; this should be oiled already. If the pad has dried out, soak it in Roebuck RB24 oil (from Buck Hickman InOne, U.K.) for 10 minutes, and allow it to drain for 15 minutes before fitting
- Replace the roller, washer, spacer and nut and set the clutch torque (see **Section 6, paragraph 5.2, "Setting the Clutch Torque"**)

5.2   Setting the Clutch Torque

At machine build, the clutch torques are set using a torque gauge. The following procedure should be used to set the torque when a replacement felt is fitted.

Note: To set torque (refer to **Figure 6-2**):

- Remove the plastic end cap (1)
- Use a box spanner (deep socket nut driver) (10mm AF) on the nut (2) to adjust the torque; turn the nut clockwise to increase torque
- To set the torque, first turn the nut counterclockwise until the clutch slips very easily
- Next, use a pull scale or a 3-lb. (13.3 Newton) weight; hook the scale or weight to the U-pin; turn the nut clockwise until the clutch is tight enough to hold a 3-lb. pull at a 90 degree angle to the diameter of the roller (refer to **number 6** in **Figure 6.2**)
- Replace the plastic end cap when the correct movement has been obtained

6.0 Sensor Adjustment

6.1 Low Reel Sensor

An optical sensor is used to detect when the supply reel diminishes below a set level. The sensitivity of the sensor is adjusted by a screw on the sensor.

6.2 Nip Home Sensor

The position of the nip arm is monitored to ensure that the feeder and nip arm are correctly in position before feeding starts.

A small, barrel type, inductive sensor is used to sense the position of the rear of the pivoted nip arm.

To replace this sensor:

- Turn off all power to the machine
- Turn off and lock off the air supply to the machine
- Remove the rear cover

The sensor is located adjacent to the feed roller drive pulley.

- Remove the lock nut and unscrew the sensor
- Close the nip roller
- Screw in the new sensor

Note: There should be a 0.1mm gap between the sensor and the end of nip arm.

- Secure the lock nut
- Reconnect the sensor wiring
- Replace the machine covers
- Power on the machine and use the I/O screen to ensure that the sensor is operating correctly

6.3 Tag Gap Optic

An optical slot sensor is used to determine if the tags are stopping in the correct position. Infrared light is passed from a transmitter to a receiver on the ends of the sensor. The tags are run through this sensor, and the amount of light passing through the tags or tag gap is recorded as a voltage change and stored as a digital figure which is used by the processor.

Cimjet RFID uses stepper motors and will step these at either 8 steps/mm or 12 steps/mm. The backing web in the gap between tags will allow more light to pass through than the backing web and tags together. These voltage levels are used to determine if a tag, backing web and no tags, are present in the sensor.

An example of how this process works is described below:

Tag size 100mm (3.94")

Tag gap 3mm (.118")

Stepper motor 8 steps/mm

When the Cimjet RFID feeds datum labels, the processor will record a constant voltage level for 800 (100mm [3.94"] x 8) steps of the stepper motor and then record a rise in the voltage level for 24 steps (3mm [.118"] x 8).

This is used to inform the processor when to start and stop feeding.

If these levels start to vary, the machine will initiate a tag feed fault.

If the tag gap happens to stop in the gap sensor, this will cause tag feed problems. A second hole position for the gap sensor is provided in the base plate for this condition.

Two possible optic positions are provided. The standard position is the farthest position away from the beak.

If the gap optic has to be moved, the **OPTIC ADJUST** parameter should be set accordingly to minus 100 (-10mm)

After adjustment, reset the gap optic.

The gap threshold voltage is the transition voltage where the processor senses that it is transitioning from a tag to a gap or vice versa. The setting for the threshold voltage should be at the midpoint of the gap voltage and the label voltage.

To view the tag gap optic sensor output voltages:

- Press **ENGINEER Mode**
- Press **DIAGNOSTICS**
- Press **DISP I/O**
- Press **NEXT**; then scroll through the menu until you get to **LABEL GAP**

Manually move the label through the sensor. Note the voltage when the sensor is looking through the gap (just webbing material) versus when it is looking through the label on the webbing material.

Check that the threshold voltage is set midway between the gap voltage and the label voltage.

To check the threshold voltage: In **RESTRICTED SETUP**:

- Press **SET PARAMETERS**
- Press **MACHINE OPTIONS**
- Press **MACHINE CONFIG**
- Press **NEXT** to scroll through to **GAP THRESHOLD VOLTS**
- Press **CHANGE** to change the value

7.0   Drive Belts

Cimjet RFID has a single drive system:

• Tag web drive

Tag Web
Drive
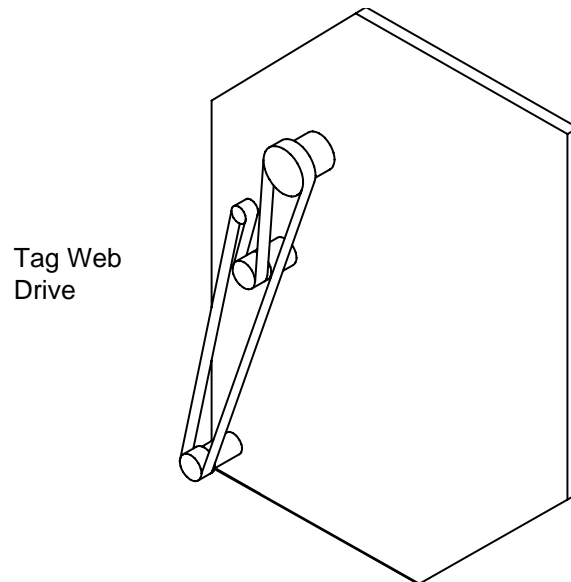
Figure 6–3 Web Drive

The illustration shows the position of the stepper motor used and the path of the timing belt.

To remove the web drive belt:

• Loosen all four screws on the stepper motor
• Remove the belt tension by rotating the eccentric cam; loosen the eccentric's fixing screw on the FRONT of the Cimjet RFID and rotate it using the tommy bar hole provided
• Remove the belt

To replace the web drive belt:

Feed the belt into position.

- Remember to tighten the motor screws before checking the belt tension
- Do not put an excessive amount of tension on the belt as this places undue strain on the motor bearings and will lead to premature wear

There should be approximately 15mm (.591") of movement in the belt.

8.0   Maintaining the Compressed Air

The compressed air supply to the machine may contain moisture. A water trap is provided in the main pressure regulator, and this will require draining at regular intervals prior to machine use.

Carry out the following procedures:

- Check the water level in the water trap
- Place a suitable container under the water trap and drain by pressing the valve pin in the base of the filter
- Check all of the air lines for leaks, security and condition
- Replace any defective air lines or connectors

SECTION 7

Technical Information

1.0   Power Configuration

Before installing the Cimjet RFID, ensure that the power supply is correctly configured.

The power supply is configured by:

- Power connections to the Toroidal transformer located at the rear of the machine

The Cimjet RFID is normally configured with the necessary power connections and fuse fitted to suit customer requirements. If the requirements change, the Cimjet RFID can be quickly reconfigured by modifying the power connections.

1.1   Power Connector

A STASEI2 type connector is used for power. Single phase live, neutral and earth connections are required.

- Pin 1 – Live
- Pin 2 – Neutral
- Ground pin – Earth

Ensure that the securing screw for the outer cover is always fitted.

The power requirements are 110 - 230V AC, Single phase rated at 375VA continuous, 750VA maximum at switch on.

1.2   Power Connections

The power connections are made at the terminal located at the rear of the machine.The connection arrangement depends on the supply voltage. The machine can be configured for 115V or 230V by adding or removing the wire link provided. Connect the live (brown) wire, neutral (blue) wire and appropriate link as shown.
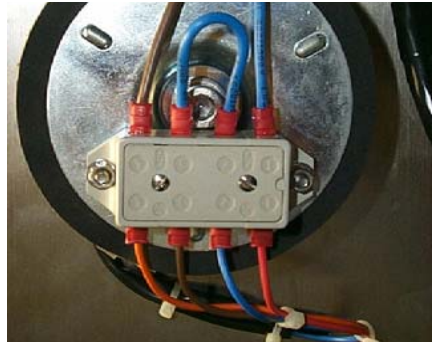
Figure 7–1 Power Terminal
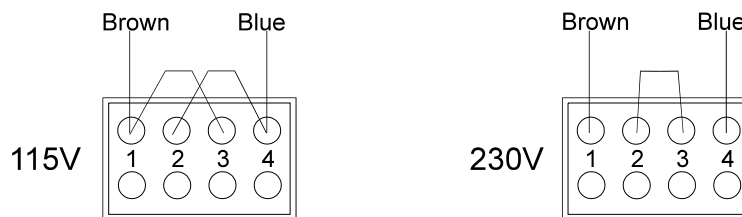
Figure 7–2 Power Connection Arrangement

2.0 The Cimjet RFID Main Processor Board

TB1, X29, X30 and X40 are on the other side of the Control
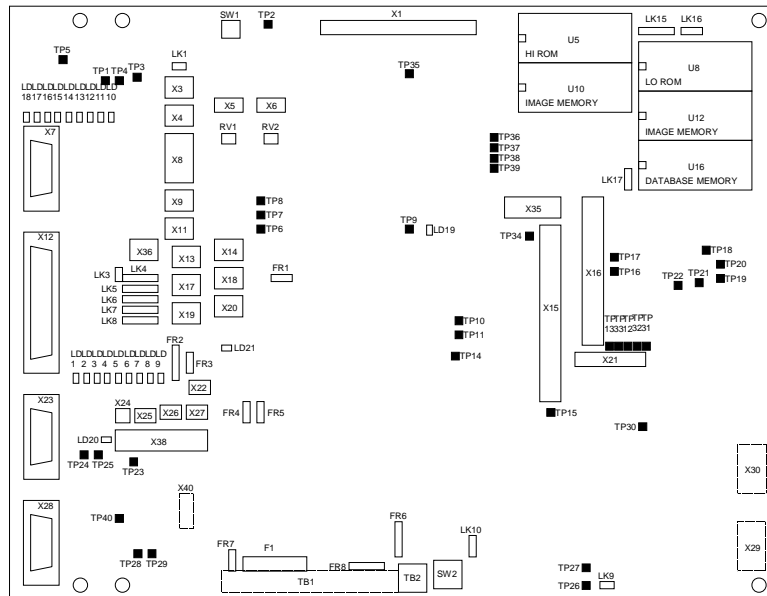
Figure 7–3 Cimjet RFID Main Processor Board

The main processor board is situated on the rear of the dispenser. This board provides all the processing power, I/O buffering and power for the feed control and general machine control for the Cimjet RFID.

Details on the board main components are provided in the following paragraphs:

- On-board Connectors
- LEDs
- Links
- Test Points
- Fuses
- Firmware and RAM
- Sensor Voltage Adjustment

2.1   On-board Connectors

Table 7–1 On-board Connectors

Connector	Function
TB1	Main Power Connector – 12-way
X1	Expansion I/O Connector
X2	
X3	Head Lift Solenoid
X4	Totalizing Counter 1 – 24VSOL 2 – Output
X5	Gap Optic Drive 1 – Drive 2 – 0VA 3 – +5VA 4 – Sense
X8	Beacon Outputs 1 – Ready (N/O) 2 – Warning (N/O) 3 – Fault (N/C) 4 – 0VP
X9	Output #5 (N/C) – 2-way Molex Connector 1 – Signal 2 – 0VP
X10	
X11	Output #5 (N/O) – 2-way Molex Connector 1 – Signal 2 – 0VP
X12	External I/O Connector – 25-way D-type Socket
X13	Output #8 (N/O) – 2-way Molex Connector 1 – Signal 2 – 0VP

Table 7–1 On-board Connectors

Connector	Function
X14	Output #8 (N/C) – 2-way Molex Connector 1 – Signal 2 – 0VP
X16	Operator Interface
X17	Output #9 (N/C) – 2-way Molex Connector 1 – Signal 2 – 0VP
X18	Output #7 (N/O) – 2-way Molex Connector 1 – Signal 2 – 0VP
X19	Reject Mechanism Solenoid Output #9 (N/O) – 2-way Molex Connector 1 – Signal 2 – 0VP
X20	Output #6 (N/O) – 2-way Molex Connector 1 – Signal 2 – 0VP
X22	Head/Nip Open – 3-way Molex Connector 1 – 24VS 2 – Signal 3 – 0VS
X23	External Sensor – 9-way D-type Connector
X24	Applicator Input #3 – 2-way Molex 1 – 24VSNS 2 – Signal
X25	Low Paper – 3-way Molex Connector 1 – 24VS 2 – Signal 3 – 0VS

Table 7–1 On-board Connectors

Connector	Function
X26	Applicator Input #2 – 3-way Molex 1 – 24VS 2 – Signal 3 – 0VS
X27	Applicator Input #1 – 3-way Molex 1 – 24VS 2 – Signal 3 – 0VS
X28	External Host Comms Connector – 9-way D-type Connector
X29	Web Motor Drive – 4-way Molex
X31	Internal Microprocessor Pins 1 - 36
X32	Internal Microprocessor Pins 37 - 72
X33	Internal Microprocessor Pins 73 - 108
X34	Internal Microprocessor Pins 109 - 144
X35	Internal JTAG Port
X36	Auxiliary 24V Output – 2-way 1 – 24VP 2 – 0VS
X37	
X38	SPI Interface Connector – 20-way
X39	
X40	Ethernet Option Connector – 12-way

2.2   Input and Output LEDs

Table 7–2 Input LEDs

Input LED	Function
Main Processor Board	
LD1	Feed and Apply Input
LD2	Spare External Input # 1
LD3	E-stop Monitor
LD4	Guards Monitor
LD5	Applicator Input # 3 Spare External Input # 2
LD6	Low Paper
LD7	Applicator Input # 1
LD8	Applicator Input # 2
LD9	Head/Nip Open

Table 7–3 Output LEDs

Output LED	Function
Main Processor Board	
LD10	Fault
LD11	Warning
LD12	Reject
LD13	Busy
LD14	Applicator Specific
LD15	Applicator Specific
LD16	Applicator Specific
LD17	Applicator Specific
LD18	Applicator Specific

2.3 Processor Board Links

Table 7–4 Processor Board Links

Link Number	Function
LK1	Battery Link
LK2	
LK3	Dump Valve Link (Default Link in) Remove this link to enable remote dump valve control via X12 connector
For links LK4 to LK8, configure respective outputs for: Link positions – 1-2,3-4 +24V Link positions – 2-3,4-5 Volt-free operation (Default)	
LK4	Ready Output – 5-way link
LK5	Fault Output – 5-way link
LK6	Warning Output – 5-way link
LK7	Reject Output – 5-way link
LK8	Spare Output #1 – 5-way link
LK9	Motor Safety Interlock (Default Link in) Remove link to enable remote enable/disable of the motor voltage via X12 connector
LK11 – LK14	
LK 15	Boot ROM configuration (Default A) A = On Board ROM (U2 & U3) B = Socketed ROM (U5 & U8)
LK16	Expansion ROM configuration for U5/U8 (Default A) A = Flash B = EPROM

Table 7–4 Processor Board Links

Link Number	Function
LK17	Bootstrap link (Program upgrade via RS232) A = Default B = Bootstrap enabled

2.4 Test Points

WARNING: **Only qualified personnel are allowed to use the Test Points to check the board operation. All precautions must be taken to prevent possible injury and/or damage to the product.**

Table 7–5 Test Points

Test Point	Function
TP1	0VP
TP2	0V (Logic supply)
TP3	Reject Mechanism Solenoid – PWM Switched Output
TP4	Reject Mechanism Solenoid – On/Off Switched Output
TP5	Counter Out – Output for Optional Hardware
TP7	Tag Gap – Analogue Sensor Output
TP8	Tag Gap – 0V
TP10	0VP
TP11	24V – Regulated 24V Supply
TP14	35VU – Unregulated Supply used to generate both 24V and 5V Supplies
TP15	+5V Logic Supply
TP16	Paper Steps – Stepper Clock Signal – Tag Web
TP17	Direction Paper – Stepper Direction Signal – Tag Web
TP18	Paper Stepper Ref. – Stepper Current Demand – Tag Web
TP22	0V – (Logic Supply)

Table 7–5 Test Points

Test Point	Function
TP23	232/485 – Output for RS232/485 Selection for Comms Port (Active High for RS232)
TP24	TX Data (TXD0) – Comms Port RS232 Output Data
TP25	RX Data (RXD0) – Comms Port RS232 Input Data
TP26	+VM – Motor Voltage (Nominally +42V Unregulated)
TP27	0VM – Motor Voltage Ground
TP28	0VI – Isolated 5V Supply Ground
TP29	5VI – Isolated and Regulated 5V Supply
TP35	SYSCLK – 20MHz Clock to PLD Device
TP36	Development Use Only
TP37	Development Use Only
TP38	Development Use Only
TP39	Development Use Only
TP40	Ethernet Enable (Active Low)

2.5   Fuses

Table 7–6 Fuses

Fuse	Function
FR2	24V I/O and Beacon Supplies – 1.35A
FR3	24V Solenoid Supply – 0.75A
FR4	24V SPI Supply – 0.75A
FR5	24V Sensors Supply – 0.75A
FR6	Motor/Reject Supply – 4A
FR7	5V Isolated Supply – 0.17A
FR8	5V and 24V Supplies – 5.0A

2.6   Firmware and RAM

The Cimjet RFID board supports three different options for machine control software. The software is stored in two ROMS. These will either be Flash ROM or EPROM and will be tagged with a "P" number indicating the software version. The devices will also have a tag indicating HI or LOW.

CAUTION: These devices are sensitive to static, and care should be taken not to touch the pins on the external devices.

These options are as follows:

- On-board Internal Flash ROM
- External (Pluggable) Flash ROM
- External PROMs

These various options require that the appropriate links are set.

See previous pages in this section for the correct configuration.

The devices and the sockets both carry an indent or positioning mark; these indents should be matched to ensure the devices are inserted in the correct orientation. Inserting them in the wrong orientation will damage them.

The on-board and external flash programs can be upgraded to the latest version by downloading from a PC; the EPROM versions will require new EPROMs to be fitted.

Contact your local MARKEM Business Center or Agent for details.

2.7   Switch Settings and Potentiometers

SW1 Board Reset

Potentiometers RV1 and RV2

These are used to set the voltage levels for the **Tag Gap** sensor. The default settings are characteristic of standard tags but may not be appropriate for all applications.

The voltage settings can be viewed on the **Engineer Mode Diagnostics Screen,** and the appropriate adjustments can be made to the voltage potentiometer by passing a tag with backing web, or backing web only in the **Gap** sensor.

The recomended settings are as follows:

RV1 Tag Sensor Calibration

- Tag and Backing Web <0.5V
- Web Only (Tag Gap) >1.5V, <2.5V
- Empty >4.0V

3.0   External Connectors

Input and output connectors are provided on the rear of the Cimjet RFID.

CAUTION: **It is essential that the connector dust covers pro-vided with the machine are fitted to all unused connectors to protect against dust and prevent possible static damage to internal components.**

X28
X23
X12
X7
Power Connector
Power ON/OFF Switch
Fuse
Compressed Air Input
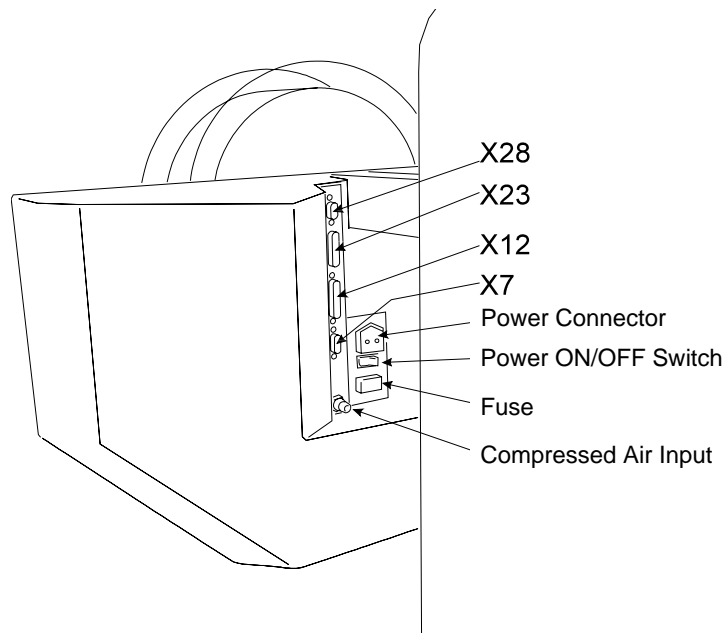
3.1 X28 Communications (Comms)

This is a 9-pin miniature D-type connector.

The X28 port supports RS232 and RS485 comms.

It provides communication to CimControl, Host PC, Mainframe or PLC and is also used for **Emulation Mode**.

Figure 7–4 shows suitable RS232 cables for connecting your PC to the Cimjet RFID. For RS485 wiring details, please refer to **Section 10 – Parts Illustrations and Schematics**.

Table 7–7 Comms Port Connections

Pin Number	Description
1	TXD0/485+
2	RXD0/232
3	TXD0/232
4	RXD0/485-
5	0V (Isolated)
6	No Connection
7	RXD0/485+
8	0V
9	TXD0/485-
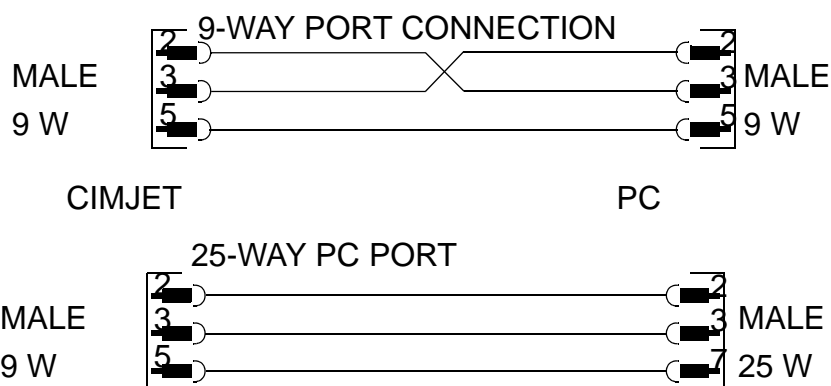
Figure 7–4 PC to Cimjet RFID - RS232 Cable

3.2 X23 External Sensor Connection

This is a 9-pin miniature D-type connector.

The X23 sensor port provides connection to external sensors, such as the **Feed** and **Apply** sensors.

The wiring requirements depend on the type of applicator used.

Table 7–8 External Sensor Connections

Pin Number	Description
1	+ 24V
2	Feed Sensor Input
3	0V
4	+ 24V
5	Laser Gate Input (LAS-G-IN) Optional Serial/Laser Board Required
6	0V
7	Product Gone Sensor (Spare Input SP-EXT-IN1)
8	Apply Sensor (Spare Input SP-EXT-IN2)
9	0V

The Inputs are designed to operate with PNP sensors or volt-free contacts. If external voltage is used, it must not exceed 30VDC.

Where volt-free contact is used, the contact should be wired between the input pin and one of the 24V supplies on the connector.

For example: Feed signal Pins 1 and 2

3.3 X12 External I/O

This is a 25-pin miniature D-type connector.

The X12 connector is used for additional machine control and monitoring signals, such as fault and warning signals, which can be used for controlling beacons or for linking to the conveyor control system.

Machine outputs can be configured to operate as volt-free contacts or as 24VDC outputs. The mode of operation for each output may be configured individually. A link on the mother board is used to select the operating mode **(refer to Section 7, paragraph 2.3 Processor Board Links)**.

- The volt-free outputs can source up to 1 amp at a maximum of 30 VDC
- In 24V mode, the Cimjet can supply up to 1 amp total across all the outputs using the 24V supply

A number of additional connections are provided:

Motor Safety

When LK9, on the mother board, is removed, the motor safety connections on X12 must be connected. The relay or output used must be capable of dealing with 35VDC at 3 amps.

Dump Valve Interlock

When LK3 on the processor board is removed, this allows the two dump valve interlock connections on X12 to be used to control the dump valve output. Dump valves are only used on applicators requiring a hard-wired dump valve to make the machine safe.

The external contact must be capable of handling 0.25 amps at 24 VDC.

Safety Module Connections

The 24V, 0V, E-stop and guard connections allow an optional safety module to be provided for applicators where the level of risk requires a hard-wired safety circuit. The N/O or N/C state indicates the state of the circuit when the Cimjet RFID is powered up and operating in a fault/warning free condition.

Note: N/O = Normally Open, C = Common, N/C = Normally Closed

Table 7–9 Safety Module Connections

Pin Number	Description	
	Volt-free Mode	+24V Mode
1	Ready (RDY) (N/O)	Ready (+24V) (LK4)
2	Ready (C)	0V
3	Fault (N/O)	Fault (+24V) (LK5)
4	Fault (C)	0V
5	Fault (N/C)	Fault (+24V)
6	Warning (N/O)	Warning (+24V) (LK6)
7	Warning (C)	0V
8	Warning (N/C)	Warning (+24V)
9	Reject (N/O)	Reject (+24V) (LK7)
10	Reject (C)	0V
11	Busy (N/O)	SPOUT (+24V) (LK8)
12	Busy (C)	0V
13*	+5V	
14*	0V	
15	Motor Safety **+** (+42V) (LK9)	
16	Motor Safety **-** (42V - SW)	
17	Dump Valve Interlink (24V) (LK3)	
18	Dump Valve Interlink (24V - SW)	
19	+24V	
20	E-stop (Monitor I/P Only)	
21	Guards (Monitor I/P Only)	
22	0VP	
23*	TXD2 (RS232 Optional)	
24*	RXD2 (RS232 Optional)	
25*	GND (RS232 GND)	

* Pins valid when optional serial/laser board installed

4.0   Status Output

The status output can be configured to inform an external control system of various conditions.

- An example is when the Cimjet RFID has completed feeding the last tag or when the Cimjet RFID has completed an apply cycle; the status output can then be reset by one of the user options in the restricted access menu, machine configure parameters.

- 24V Output (N/O) or (N/C) contacts switched by the Cimjet RFID

- Connections on **X44** (N/O) or **X45** (N/C) **–** 2-pin Molex connectors on the serial/laser board

  - Pin 1 – +24V

  - Pin 2 – 0V

For further information on status signals, please refer to the **CimComms Protocol Documentation**, which is obtainable from MARKEM or can be downloaded from MARKEM.com:

http://www.markem.com/index.jsp

5.0   Status Reset Input

In some cases, it is necessary to have secure interlocking of the Cimjet RFID with external control systems. The **Status Outpu**t is used to do this.

For example, it may be necessary for the external control system to know when the Cimjet RFID has finished feeding the last tag in order for it to accept the next feed tag signal. The **Status Output** can be configured to do this. This output can be reset by several different means, one of which is by the **Status Reset Input**.

This input is normally switched by the external control system.

Note: This is only available if the optional serial/laser board is fitted.

Connections on **X43 –** 3-pin Molex connector on the serial/laser board

*   Pin 1 – 24V DC
*   Pin 2 – Signal
*   Pin 3 – 0V

Signal can either be volt-free, using pins **1** and **2,** or a 24V signal from an external source such as a PLC, using pins **2** and **3**.

This option can be activated from the **Restricted Access\Machine Configure** parameters.

For further information on status signals, please refer to the **CimComms Protocol Documentation**, which is obtainable from MARKEM or can be downloaded from MARKEM.com.

http://www.markem.com/index.jsp

6.0   Display I/O

The **Diagnostic Display I/O** function allows the operator to monitor the status of the machine inputs and to activate the machine outputs for testing purposes.

These functions can be accessed from the **Engineer Mode** screen under Diagnostics.

- Select **ENGINEER MODE**

```
┌───┐ ┌─────────────────────────┐ ┌───┐
│   │ │                ENGINEER │ │   │
└───┘ │                    MODE │ └───┘
┌───┐ │                         │ ┌───┐
│   │ │ DATABASE   PARAMETERS   │ │   │
└───┘ └─────────────────────────┘ └───┘
```
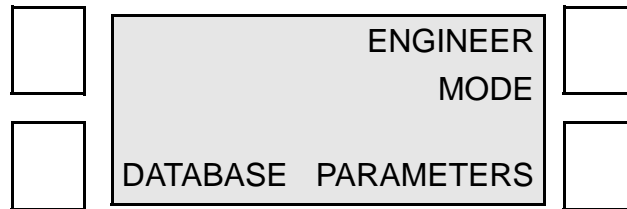
- Select **DIAGNOSTICS**

```
┌───┐ ┌─────────────────────────┐ ┌───┐
│   │ │ DIAGNOSTICS    MANUAL   │ │   │
└───┘ │                         │ └───┘
┌───┐ │ TEST           SET TAG  │ ┌───┐
│   │ │ FEED            OPTIC   │ │   │
└───┘ └─────────────────────────┘ └───┘
```
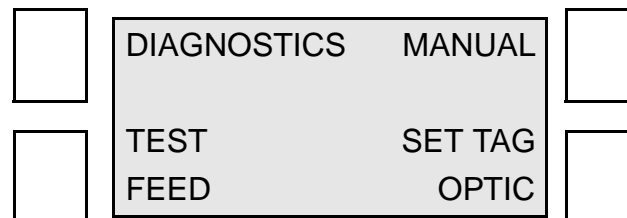
The I/O screen can be extremely useful when fault finding.

A full description of the functionality of the inputs and outputs follows:

7.0   Inputs

The functionality of various sensors and other inputs can be tested by viewing their status on the **Engineer Mode - Diagnostic** screen.

• Select **Disp I/O** from the **Engineer Mode - Diagnostic** screen

```
DISP I/O              TIMINGS
```
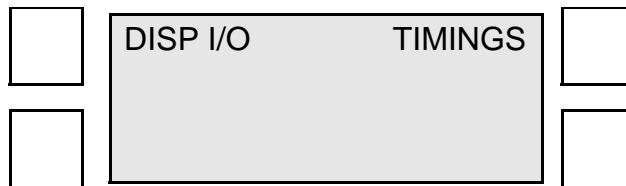
The **inputs** screen is displayed:

```
INPUTS                      1


FEED                      ON
NEXT              PREVIOUS
```
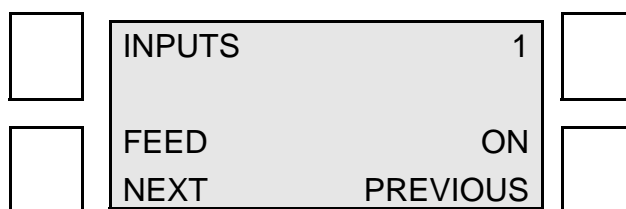
The status of **Applicator Inputs** depends on the type of applicator fitted. The applicator inputs are listed in the individual applicator sections, **Table 7-10.**

Table 7–10 Diagnostic Screen - Inputs

Input	Description
Feed	Indicates the condition of the **Sensor** signal to start the feed or feed and apply sequence Status: On/Off
Spare Input	Applicator-specific
Spare Input	Applicator-specific
Spare Input	Applicator-specific
Apply	Indicates the condition of the **Sensor** signal to start the apply sequence Status: On/Off
Low Web	Indicates the condition of the **Low Paper** warning sensor Status: On/Off
Spare Input	Applicator-specific
Spare Input	Applicator-specific
Nip Closed	Indicates the condition of the feeder and **Feed Roller Nip** sensor. Status: On/Off
Status Reset	Indicates the condition of the **Status Reset** function; this can be a signal from an external device, such as a PLC Status: On/Off
Tag Gap	Indicates the voltage levels from the **Tag Gap** sensor; these levels will change as tags or backing web are present in the sensor Status: 0V - 4.5V

Table 7–10 Diagnostic Screen - Inputs

Input	Description
Serial Laser* Chan 2	
Database Size	Displays the size of database fitted, such as 512K
Software Version	Displays the current release of firmware being used in the machine, such as P2850 - 11/07/01
Board Revision	Displays the type of processor board fitted, such as REV D

*Does not apply to Cimjet RFID

8.0   Outputs

- Select **Disp I/O** from the **Engineer Mode - Diagnostic** screen

DISP I/O	TIMINGS
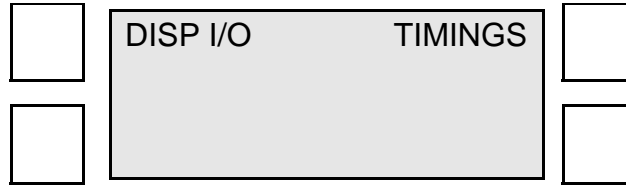
To select the **Outputs** screen:

- Press the soft key next to **INPUTS**

INPUTS	1
FEED	OFF
NEXT	PREVIOUS

The **Outputs** screen is displayed:
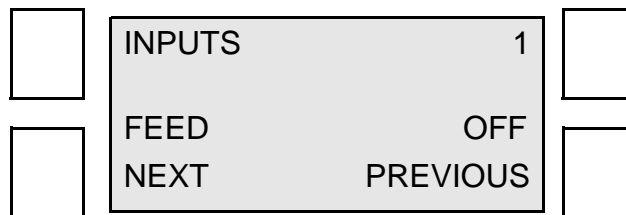
OUTPUTS	TOGGLE
READY	OFF
NEXT	PREVIOUS
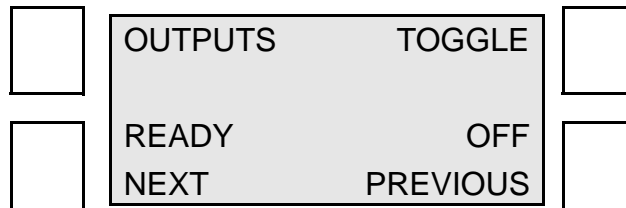
The condition of the outputs can be changed by using the **TOGGLE** soft key.

OUTPUTS	TOGGLE
READY	ON
NEXT	PREVIOUS
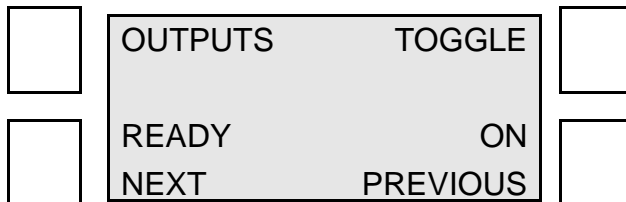
Table 7–11 Diagnostic Screen - Outputs

Output	Description
Ready	An input for the conveyor PLC or for a Beacon lamp
Warning	An input for the conveyor PLC or for a Beacon lamp
Reject	An input for the conveyor PLC or for a Beacon lamp
Machine Busy	An input for the conveyor PLC or for a Beacon lamp
Spare Output	Applicator-specific
Spare Output	Applicator-specific
Spare Output	Applicator-specific
Spare Output	Applicator-specific
Spare Output	Applicator-specific
Reject Mechanism	Activates the **Reject Mechanism**
Status Output	Status output is activated after a **status comms** message has been sent; output can be tested by activating the **Toggle** soft key

ASCII Comms connections

The **ASCII Comms** function can be initiated from a Transport control PLC or other host system. In all cases, the RS232 connections are the same.

The **ASCII Comms** option should be selected in the **Laser** parameters.

The **ASCII Comms** connections are the same as for a Wand scanner; the distinction between the two options is made when setting up the laser parameters.

The **ASCII RS232 Comms** are connected via the 25-way, external I/O connector (X12) on the rear of the machine.

- Pin 23 – TXD2 (RS232 Optional)
- Pin 24 – RXD2 (RS232 Optional)
- Pin 25 – RS232 Ground

9.0   Pneumatics

9.1   Air Requirements

A compressed air supply is required by the Cimjet RFID to drive the applicator module. This must be air at 6 Bar and should be: **dry, uncontaminated air, and not lubricated**.

A filter regulator assembly is fitted to the base of the stand; this is comprised of a manual isolation valve, a water trap, pressure regulator, and dump valve. The air supply is via a 6mm or 8mm flexible pipe.

9.2   Compressed Air Requirements

WARNING: Do not adjust the regulator pressure under any circumstances. Doing so could make the Cimjet RFID unsafe.

A filter regulator is provided as standard and includes:

- Isolation value (non-lockable)
- Pressure regulator
- Pressure indication dial (0-10 bar)
- Filter (micro mesh)
- Water trap

The **unregulated** supply goes to the Cimjet RFID **dispenser**.

The **regulated** supply goes to the **applicator**.
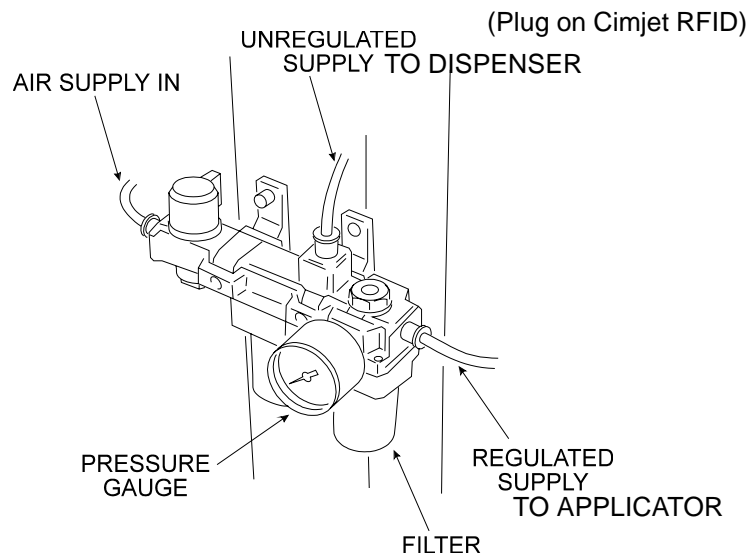
Figure 7–5 Air Filter/Regulator Unit

A 6mm (.236") push fitting is provided to accept flexible pipe.

The supply should be at 6.2 Bar (90psi). It should also be dry, clean, and not lubricated.

The regulator unit provides:

• a regulated air supply for the applicator

The **Tag Reject Mechanism** has a separate **air regulator** which is mounted inside the dispenser cover next to the solenoid valve that operates it.
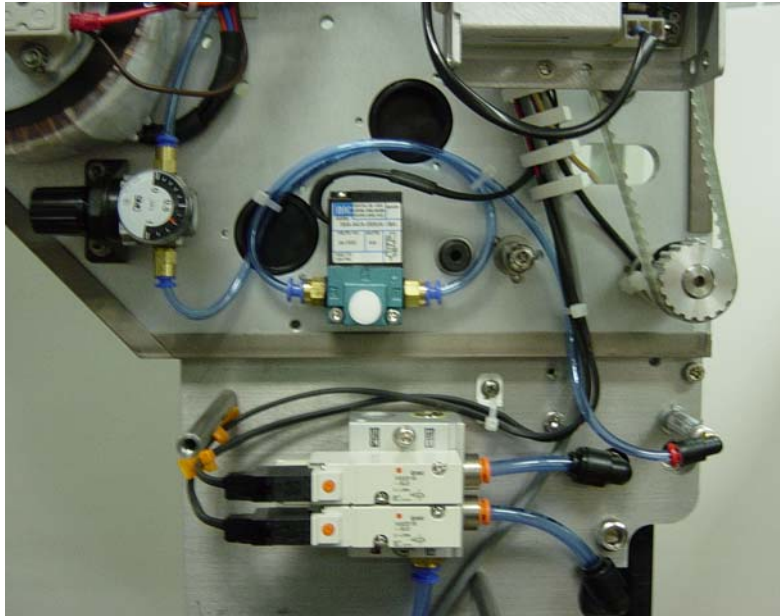
Figure 7–6 Air Regulator and Solenoid Valve for Tag Reject Mechanism

The air pressure for the **Tag Reject Mechanism** does not normally have to be adjusted and should be set to 3.5 to 4.0 Bar.

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SECTION 8

Troubleshooting Guide

SECTION 8 Troubleshooting Guide

1.0   Error Messages in Auto Mode

If a fault occurs, the Cimjet RFID comes out of **Auto Mode** and the error message is displayed. This includes a suggestion on how to clear the fault. For example:

```
FAULT 03:   NIP OPEN
   CHECK NIP
     THEN PRESS AUTO
```
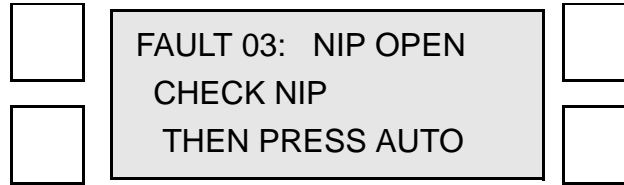
When Cimjet RFID is in error, the **machine ready output** is opened and the **fault output** closes.

The following tables list the errors that can occur, together with the remedial action required to rectify the fault. If the fault cannot be cleared, refer to **Section 7 – Technical Information** for further details, or seek qualified MARKEM technical assistance.

2.0 Power-up Error Messages

These errors can be generated when the Cimjet RFID is powered up. If the battery backed RAM is corrupt, one of the following messages will be displayed:

Table 8–1 Power-up Error Messages

Message	Indication/Action
Parameters Lost	**Setup parameters are corrupt** Check all setup parameters to ensure correct operation
Memory Lost	**Parameter database has become corrupt** Re-power the machine while pressing the **Enter** and **Exit** keys at the same time; this will clear any corruption in the processor

3.0   Start-up Error Messages

Table 8–2 Start-up Error Messages

Message	Action
Low Web	Indicates that the tag supply is getting low; this is only a visual warning and does not stop Cimjet RFID operation
No Web	The **tag gap** sensor is not detecting tags. If tags are loaded, check that the tags are passing through the **tag gap optic** sensor. If tags are present, reset the **tag gap optic** from the **Engineer Mode Parameters**
Nip Open	Ensure that the nip roller has been secured back in place
Missing Tag	The Cimjet RFID has detected that there are tags missing from the web. This can cause products to be untagged. Check the tag stock for missing tags and replace the reel if necessary.

4.0 Other Error Messages

You may see other errors, such as a **CYLINDER FAULT**, which are associated with the applicator.

A complete list of all Cim* series machine error messages follows:

Table 8–3 Other Error Messages

Fault Number	Description/Action
01	**NO WEB** CHECK TAG SENSOR THEN PRESS AUTO
03	**NIP OPEN** CHECK NIP THEN PRESS AUTO
04	**CYLINDER FAILED TO RETURN HOME** PRESS AUTO
05	**MISSING TAG** CHECK TAG SUPPLY THEN PRESS AUTO
06	**MISSING GAP** CHECK TAG SENSOR THEN PRESS AUTO
07	**PACK SPACING** INCREASE SPACING THEN PRESS AUTO
08	**LOW AIR** CHECK AIR SUPPLY THEN PRESS AUTO
09	**E-STOP** RELEASE E-STOP THEN PRESS RESET TO CLEAR
10	**PAD NOT HOME** PUSH PAD HOME THEN PRESS AUTO
11	**GUARD OPEN** CLOSE GUARD THEN PRESS RESET

Table 8–3 Other Error Messages

12	**NO PRODUCT DETECTED** PRESS AUTO
17	**WARNING: ALLOCATION COMPLETED** SEND NEW ALLOCATION OR PRESS AUTO TO CLEAR
18	**APPLICATOR ARM NOT HOME** PRESS AUTO
19	**NO TAG HAS BEEN DETECTED ON THE APPLICATOR** PRESS AUTO
20	**PAD HAS FAILED TO RETURN HOME** PRESS AUTO
22	**CYLINDER 1 TIMED OUT** PRESS AUTO
23	**CYLINDER 2 TIMED OUT** PRESS AUTO
24	**PAD ROTATE TIMEOUT** PRESS AUTO
25	**APPLICATOR OBSTRUCTED IN CYCLE** PRESS AUTO
26	**NO REJECT TAG AVAILABLE** PRESS AUTO
31	**SENSOR MODE/CYCLE 1 EXPECTED/CYCLE 2 DETECTED.** PRESS AUTO
32	**SENSOR MODE/CYCLE 2 NOT DETECTED** PRESS AUTO
33	**SENSOR MODE/PALLET PRESENT/ REMOVED IN CYCLE 1** PRESS AUTO
34	**SENSOR MODE/CYCLE 2 INPUT BEFORE EXPECTED** PRESS AUTO

Table 8–3 Other Error Messages

35	**PLC MODE/CYCLE 2 DETECTED/ NO CYCLE 2 DEFINED** PRESS AUTO
36	**HOST PRINT/CYCLE 2 DETECTED/ NO CYCLE 2 DEFINED** PRESS AUTO

5.0   Communications Problems

If you cannot download information from your host PC, check the following:

RS232 and RS485

- The correct cable is in use
- The cable is connected to the correct host port on the Cimjet RFID
- Ensure that the cable has no broken wires or shorts between wires
- Check that the communications parameters for the Cimjet RFID and the host computer match

    These are:

    Communications Speed (Baud Rate)
    This is set in **Restricted Access Mode**
    Data Bits, Stop Bits and Parity
    Cimjet RFID always uses 8 data bits, 1 stop bit and No parity

- The Cimjet RFID is set for the correct communications type, such as RS232 or RS485

- The correct protocol is being used, such as (CIMCOMMS or EMULATION) in restricted mode

- If a non-MARKEM host system is being used, ensure that it is controlling **TX-enable** correctly and that there are no pauses in the middle of message transmissions

6.0   Tag Feed Problems

Tag feed problems can be caused by several things such as:

- Machine being incorrectly webbed
- Drive belts slipping
- Stepper motor stalling
- Faulty gap sensor
- Incorrect parameter settings

If, for example, the stopping position was consistently wrong, the most likely cause would be the parameter settings, such as the feed distance.

If the stopping position is inconsistent, the cause is more likely to be another possibility, such as the drive belt slipping or stepper motor stalling.

6.1   Incorrect Tag Stopping Position

If the tag stopping position is incorrect after datum tags have been fed and the stop position is consistent, check the following:

- **FEED ADJUST** parameter
- **BACKFEED** parameter (should always be set to 0 for Cimjet RFID)

See the print parameter information in **Section 4 – Restricted Access Mode User Guide**.

6.2   Erratic Tag Feeding

If the tags are feeding erratically, the **gap optic** settings may need adjusting. To set the **gap optic**, carry out the following procedure:

- Press **ENGINEER MODE**
- Press **SET TAGS OPTIC**

The machine will now feed datum tags and will determine the **optimum sensor signal** for the tag/web and web.

- Ensure that the **Outer** tag guide collars are set to the width of the tag size being used, as this will stop the tag from tracking in and out of the gap sensor

Note: Do not adjust the **Inner** collars as these are set to a fixed distance from the baseplate.

6.3 Inconsistent Tag Stopping Position

6.3.1 If the Tag Stops in the Correct Position

If the tag stops in the correct position when datum tags are fed, but the stop position is inconsistent **after** this, do the following:

- Check that the tag gap is not stopping in the **Tag Gap Optic**; this may be purely coincidental because of the tag size, but it will cause feed problems
- If this happens, move the sensor to the alternative position on the baseplate and amend the **Optic** adjust parameter accordingly

See the feed parameter information in **Section 4 – Restricted Access Mode User Guide**.

- Drive problems, such as drive slippage, could also cause variations in tag stop position
- Check that the nip roller is positioned in the center of the tag
- Check that the drive roller is clean
- Check that the dancer arm is operating

6.3.2 If the Tag Stops in an Inconsistent Position

If the tag stops in an inconsistent position **after** a datum feed, the gap sensor threshold voltage may need to be adjusted.

Press **ENGINEER Mode**

Press **DIAGNOSTICS**

Scroll through **DIAGNOSTICS** to **INPUTS**

Scroll through **INPUTS** to **LABEL GAP**

Move the label up and down through the label gap sensor

- Record the voltage when the sensor is looking through the gap
- Record the voltage when the sensor is looking through the label

Calculate: (gap voltage + label voltage) ÷ 2 = gap threshold voltage

To check the threshold voltage: In **RESTRICTED SETUP,**

- Press **SET PARAMETER**
- Press **MACHINE OPTIONS**
- Press **MACHINE CONFIG**
- Press **NEXT** to scroll through menu to **GAP THRESHOLD VOLTS**
- Press **CHANGE** to update the threshold voltage value to the calculated threshold voltage

7.0   No Driving of Tags

Check the following:

- Ensure that the clutches are operating correctly
- Check for broken drive belts
- If there is no motor voltage, check fuses and motor voltage test point
- Ensure the external motor control link is in position - LK9 on the main PCB

8.0   Motor Stalling

Tag feed problems could also be caused by the motor stalling.

The following problems may be the cause:

- The machine is webbed up incorrectly
- The brake band mechanism is too tight
- Incorrect drive belt tensions
- Incorrect clutch tensions
- Loose connections to the stepper motors
- Seized rollers or loose drive pulleys

SECTION 9

Recommended Spares

SECTION 9 Recommended Spares

1.0   Recommended Spares

Preventive Maintenance Spares Kits are listed below. These are followed by General Spares Kits.

1.1   Preventive Maintenance Spares Kits

Table 9–1 Roller Cleaning

Part No.	Qty	Description
5824648	100	Cleaning Pads

Table 9–2 Maintenance Parts – 100mm (3.94")

Part No.	Qty	Description
33110BA	1	Felt Washer Kit
1116540	1	Nip Roller Assembly
33817BA	1	Two-sensor Assembly
5825198	1	Brake Band
5564717	1	100mm (3.94") Wide Idler Roller Assembly

1.2 General Spares Kits

Table 9–3 Basic Spares Dispenser Parts

Part No.	Qty	Description
31A104A	1	Tag Gap Sensor
5943412	1	Nip Latch Knob
31A58A	1	Nip Sensor
B03876AA	1	Low Web Sensor
B04297AA	1	Spare Main Fuse (T5A)
32621BB	1	Operator Panel Assembly
35146BA	1	LCD Display Assembly
5564342	1	Solenoid Assembly

1.3 Left-hand Change Parts

Table 9–4 Left-hand Change Parts

Part No.	Description
B05281AA	452-906 Blank Insert
B03636AA	453-886 Screwlock 8mm 4
B00215AA	Fastening M5 x 10mm Cap
B00216AA	M3 Plain Washer
B00217AA	M3 Shakeproof Washer
B001171AA	M3 Full Nut
B05088AA	M3 Ext Star Lock W'R RS
B03697AA	M3 x 20 Skt Set Screw
5824954	CIM300 LH Cover Assembly
5710372	LH Outside/inside Wound
5364271	D Connector Strip LH
5710264	Ident. Label LH

Section 10

Parts Illustrations and Electrical Schematics