DOMINO

Ax Series – QMM User Manual

Electronic Technical Report

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Modification Record

Issue	Date	Author	Changes
0.1	29th Jan 2016	Greg Dorsett	First draft of document for electronic signature review
1.0	8th Feb 2016	Greg Dorsett	Minor updates after review
2.0	23rd Feb 2016	Greg Dorsett	Updates after review by RN Electronics
3.0	16th May 2016	Adhi Narayanan	Updates to Sections 2 and 6 in response to comments from FCC/IC Certification Body. References to "Galileo" now replaced by "Ax Series".

Contents

1.   Introduction

This document is the user manual for the Quality Management Module (QMM) which is a combined radio frequency identification (RF ID) tag reader and fluid level sensing system. This system is exclusive to the Ax Series range of continuous inkjet (CIJ) printers. The system has been implemented to protect the consumables used within the printer. This includes the ink and make up cartridges and the iTech module (ITM). The system also provides a fluid level sensing capability for the make-up module (MUM) which contains solvent and the ITM which contains ink.
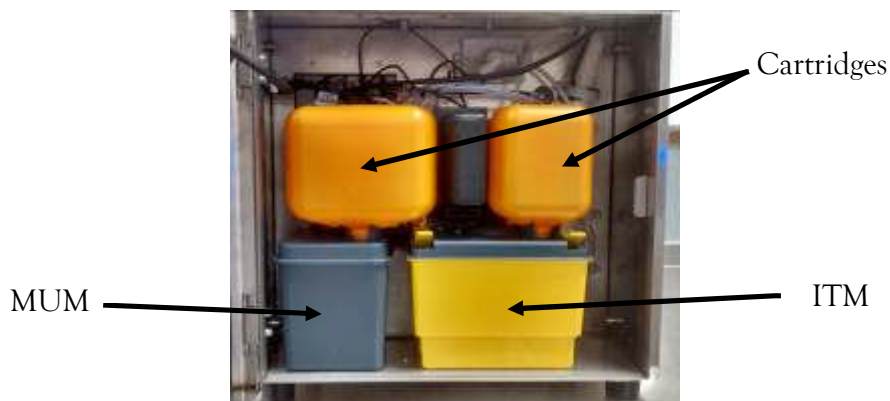

Figure 1 – Ax Series Printer

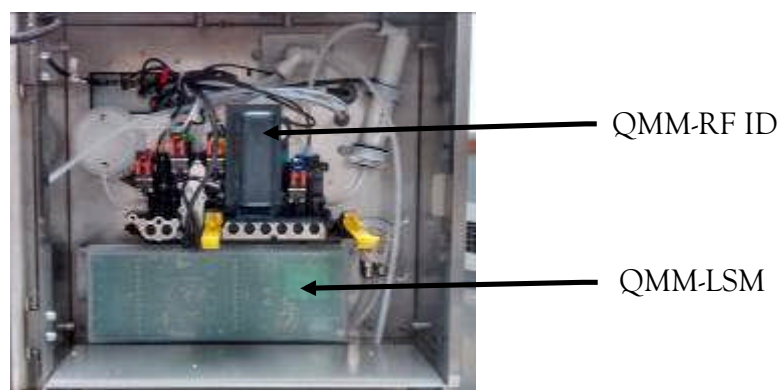Figure 2 – Inside the Ax Series Printer Showing Cartridges, MUM and ITM

Figure 3 – Quality Management Module within Printer

2.   System Overview

The RF ID and level sensing module (LSM) sub system, known as the QMM, installed into Domino CIJ printers provides communication to RF ID tags fitted to ink and make up cartridges and the ITM. These are replaceable service items within the printer. The MUM contains solvent but is not a service replaceable item, so does not have an RF ID tag. The system also provides fluid level information for the MUM and ITM.

The QMM has been designed specifically for the Domino CIJ printer and cannot be retro fitted to other Domino products and is not suitable for installation in third party printers.

The system comprises two units, the QMM-RF ID unit and the QMM-LSM unit connected by a single cable. The top QMM-RF ID module is detachable from its bracket for easing access to the solenoids and ink manifold.


Figure 4 – Quality Management Module

The two modules are fully sealed to IP54 against the ingress of dust and fluids and have been manufactured in materials which are tolerant to chemical attack from Methyl Ethyl Ketone (MEK) and acetone solvents and inks.

The system is powered and communicates with the printer via a single universal serial bus (USB) cable. The QMM-RFID unit cannot operate independently from the QMM-LSM unit. The QMM-RFID connector (see section 3) and pin-out is unique to this unit which prevents third party devices being connected.

The QMM-RF ID unit has integrated tricolor light emitting diodes (LEDs) which indicate the status between the QMM and the cartridge and ITM tags.

3.   Installation

The QMM sub system is installed in four steps. Ensure the machine is powered off and the power cord is removed:
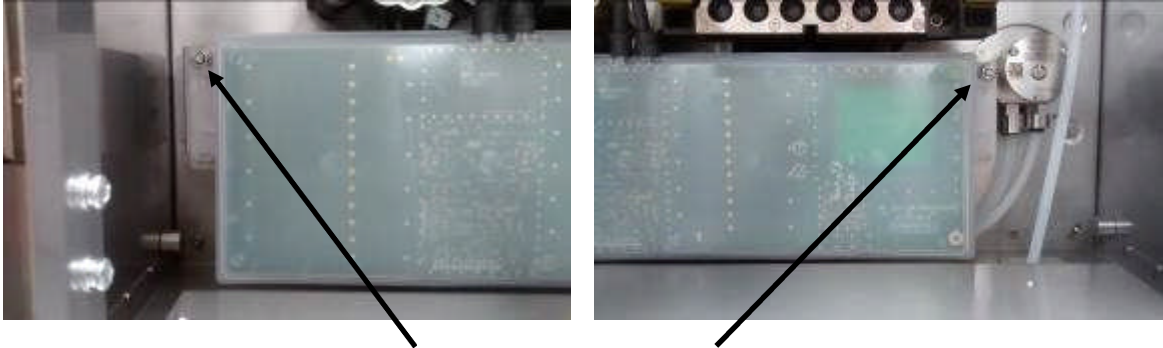
- Place the QMM-LSM module into the printer on the brackets provided. The lugs on the QMM-LSM module should locate into the holes within each bracket. Secure the module with two M4 nuts (Domino part number 1-0140414).
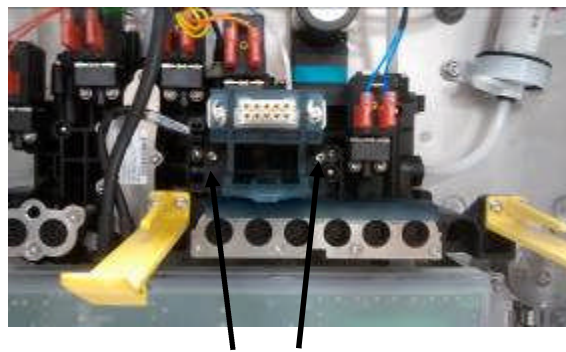
- Locate the QMM-RF ID bracket onto the ink block of the printer. There are two location bumps on the back of the bracket which line up the bracket on the ink block. Secure the bracket in place with two M3 x 10mm torx screws (Domino part number EPT020362).
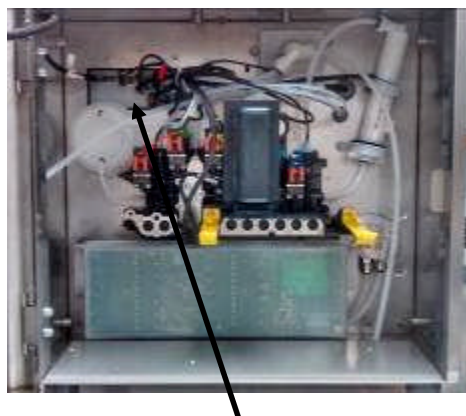
- Plug in the USB cable into the ink interface printed circuit board (PCB) USB socket on top left of the back wall of the ink enclosure.

- Slide the QMM-RF ID module onto the bracket until the release tang snaps into place to lock the module in place.
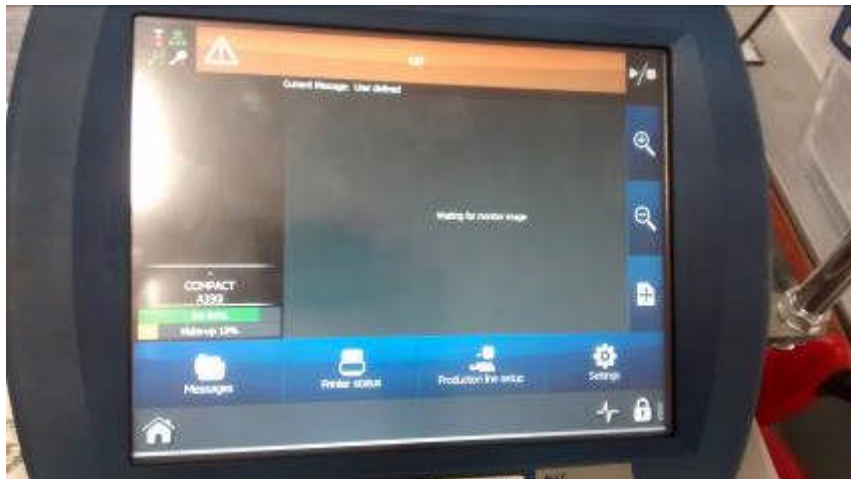
Carry out a calibration procedure as described in section 4.

4.   Calibration

1. Turn on the printer by pressing the left hand power button.

2. Allow the machine to boot up to the home screen, as shown below.

3. Open the door and remove the two cartridges, the grey MUM and the yellow ITM.

    The solvent cartridge is removed by twisting clockwise (seen from above). The ink cartridge is removed by twisting anti-clockwise (seen from above). The cartridges will self-seal when removed.

    The ITM requires the yellow latches to be lifted before the unit can be pulled out of the machine.

    The MUM has a retaining thumb screw which should be removed first. Withdraw the MUM and remove the plastic pipe. This is removed by pushing in the black retaining collar into the MUM and pulling out the pipe.
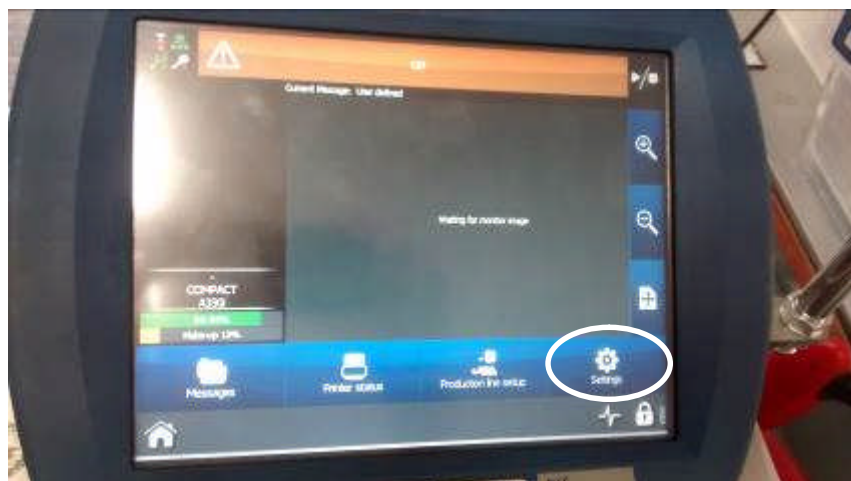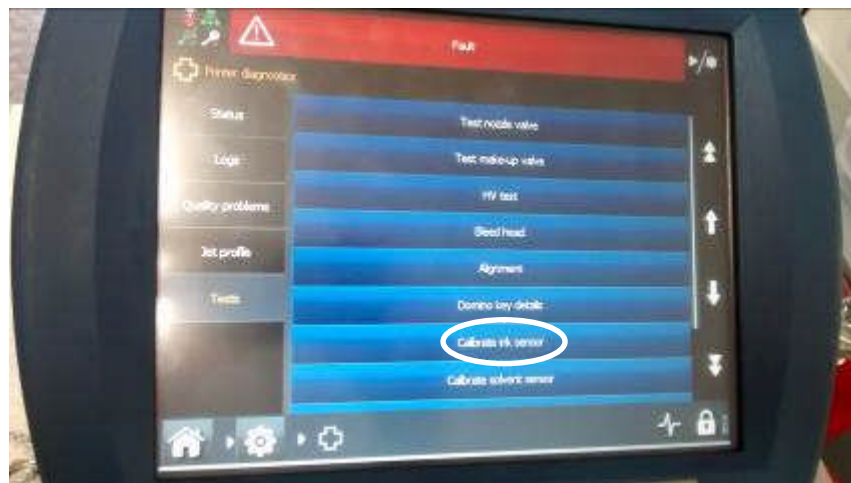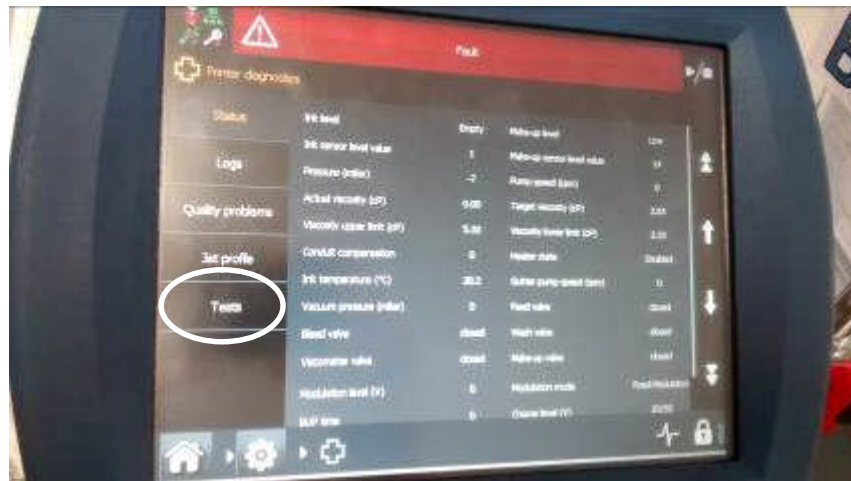
**CAUTION: TAKE CARE WHEN REMOVING MUM AND ITM
AS FLUID WILL SPILL OUT OF THESE IF NOT KEPT LEVEL**

4. Place a clean and empty MUM and ITM in the printer.

5. Close the door of the printer.

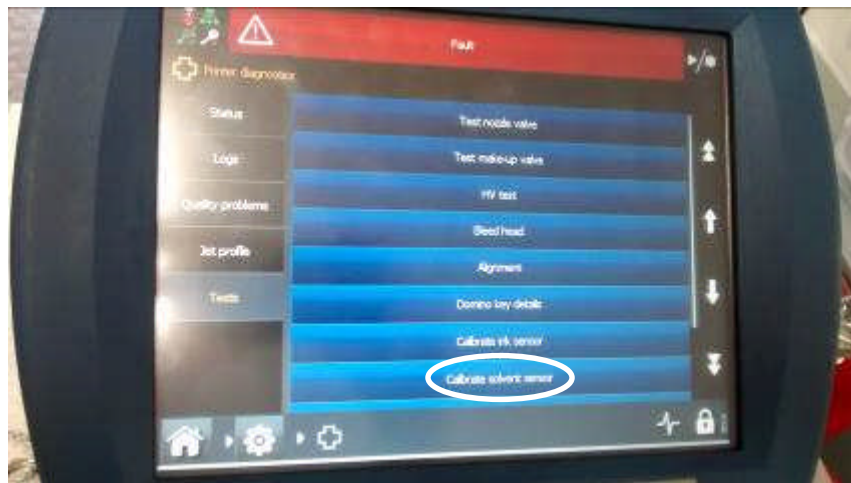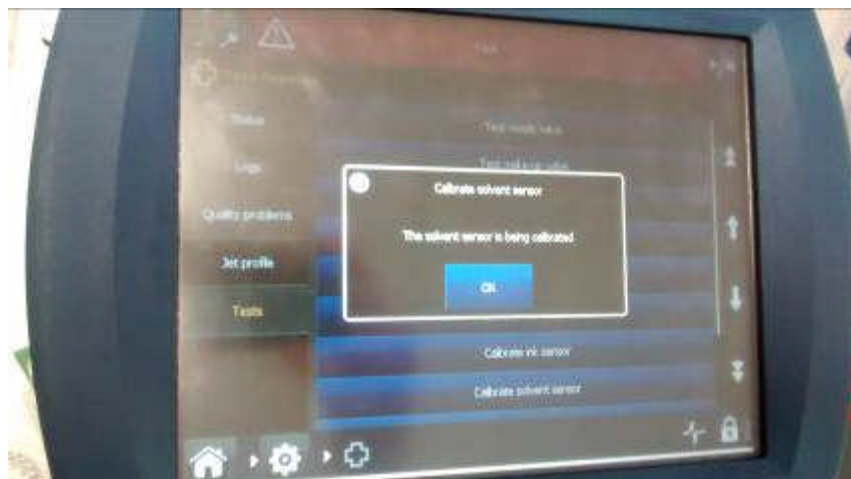6. From the touch screen select SETTINGS > DIAGNOSTICS > TESTS > CALIBRATE INK SENSOR.

7. When the pop up screen is displayed, press OK.

8. Select CALIBRATE SOLVENT SENSOR.

9. When the pop up screen is displayed, press OK.

10. Press the 'Home' key and check the ink and Make Up values have returned to 1%.
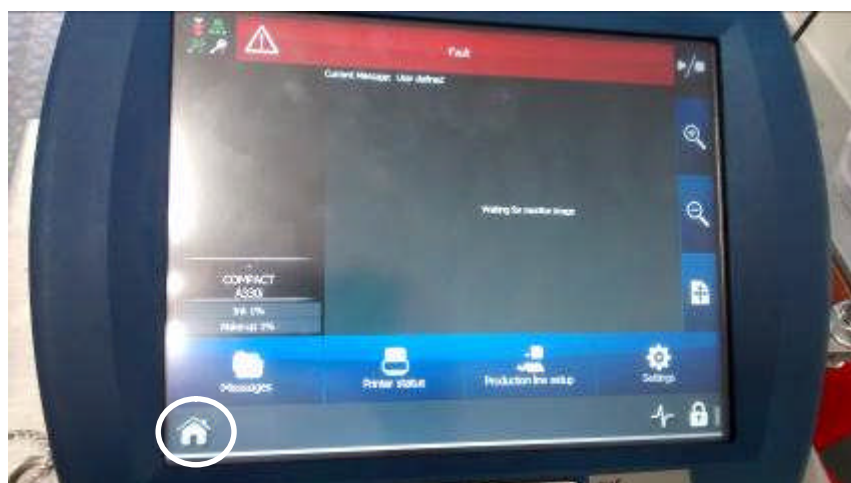
11. Open the door and remove the empty clean MUM and ITM.

12. Replace the original MUM, ITM and cartridges. Close the door.

13. Turn the printer off by holding the power button in for longer than 10 seconds.

14. Turn the printer on by pressing the power button and allow to boot to the home screen.

15. Check the levels on the touch screen. (MUM and ITM full to the chicken feeder levels should display around 85% ink and solvent).

16. The calibration procedure is complete.

5. Operation

The QMM is transparent in operation to the user except when a new cartridge or ITM is fitted. When a new cartridge or ITM is fitted to the printer, the following procedure should be adopted:

- Remove the old cartridge or ITM, if already fitted. The LED associated with that container will turn amber when a cartridge or ITM is not fitted.

- Offer the replacement cartridge or ITM to the printer without inserting the unit into its final position to allow the RF ID tag to be read. Failing to observe this may result in contamination of the ink system and subsequent printer shutdown.

- The LED for the associated container will flash green whilst the tag data is being read.

- When the LED turns green, the cartridge or ITM has been deemed acceptable and can be fully inserted into to its normal operational position.

- If the ink type is incorrect or the tag is indicating an empty or obsolete cartridge or ITM, the LED will turn red. A new cartridge or ITM should be inserted.

- If the tag is faulty such that the QMM system cannot read the data, the LED will remain amber. A new cartridge or ITM should be inserted.

- Follow any on screen instructions given by the printer.

In normal use, the LSM information is displayed in graphical form on the home page of the user interface. Tag data for each ink container and the ITM is available to a service engineer through the user interface at the following location:

SETTINGS > ADVANCED > INK DETAILS

6.   Compliance Statements

The QMM module has been tested to FCC 15.209 radiated limits for a class B digital device. The QMM will be installed within the printer which is tested as a Class A digital device.

This device complies with Part 15 of the FCC Rules and Industry Canada licence exempt RSS standard(s). Operation is subject to the following two conditions:

> 1. This device may not cause interference, and
> 2. This device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

> 1. l'appareil ne doit pas produire de brouillage, et
> 2. l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Class B device:
NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur
in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

The equipment has been tested and found to comply with the Specific Absorption Rate (SAR) and Radio Frequency (RF) field strength limits as detailed in RSS-102.

In accordance with RSP-100 section 3.2 & FCC CFR47 **§15.212**, the printer (host product) label shall contain the following statement:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
Contains FCC ID: 2AHFK-EPT012462
Contains IC: 21200-EPT012462

Below is an example of the printer (host product) label containing the statement above.

7. Glossary

Term	Definition
CIJ	Continuous Inkjet
FCC	Federal Communications Commission
IC	Industry Canada
ITM	iTech Module
LED	Light Emitting Diode
LSM	Level Sensing Module
MEK	Methyl Ethyl Ketone
MUM	Make Up Module
PCB	Printed Circuit Board
QMM	Quality Management Module
RF	Radio Frequency
RF ID	Radio Frequency Identification
SAR	Specific Absorption Rate
USB	Universal Serial Bus

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