



Australian Government

National Standards Commission

12 Lyonpark Road, North Ryde NSW 2113 Australia

Cancellation

Supplementary Certificate of Approval No S334

This is to certify that the approval for use for trade granted in respect of the

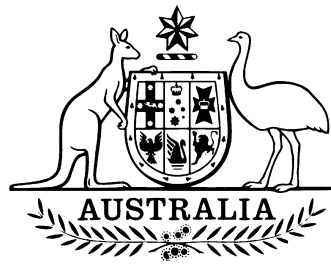
Email Model Midas MAM Bulk Flowmetering Control System

submitted by Diamond Key International Pty Limited
110 Henderson Road
Rowville VIC 3178

has been cancelled in respect of new instruments as from 1 January 2004.

Signed by a person authorised under Regulation 60
of the National Measurement Regulations 1999 to
exercise the powers and functions of the
Commission under this Regulation.

A handwritten signature in black ink, appearing to be "J. H. C.", written over a light-colored rectangular background.



National Standards Commission

12 Lyonpark Road, North Ryde NSW

Supplementary Certificate of Approval

No S334

Issued under Regulation 60
of the
National Measurement Regulations 1999

This is to certify that an approval for use for trade has been granted in respect of the

Email Model Midas MAM Bulk Flowmetering Control System

submitted by Diamond Key International Pty Limited
110 Henderson Road
Rowville VIC 3178.

NOTE: This Certificate relates to the suitability of the pattern of the instrument for use for trade only in respect of its metrological characteristics. This Certificate does not constitute or imply any guarantee of compliance by the manufacturer or any other person with any requirements regarding safety.

CONDITIONS OF APPROVAL

This approval becomes subject to review on 1 October 2001, and then every 5 years thereafter.

Instruments purporting to comply with this approval shall be marked NSC No S334 and only by persons authorised by the submitter.

Instruments incorporating a component purporting to comply with this approval shall be marked NSC No S334 in addition to the approval number of the instrument.

It is the submitter's responsibility to ensure that all instruments marked with this approval number are constructed as described in the documentation lodged with the Commission and with the relevant Certificate of Approval and Technical Schedule. Failure to comply with this Condition may attract penalties under Section 19B of the National Measurement Act and may result in cancellation or withdrawal of the approval, in accordance with the Commission's Document NSC P 106.

The Commission reserves the right to examine any instrument or component of an instrument purporting to comply with this approval.

Auxiliary devices used with this instrument shall comply with the requirements of General Supplementary Certificate of Approval No S1/0/A.

DESCRIPTIVE ADVICE

Pattern: approved 24 September 1996

- An Email model Midas MAM control system for use in a Commission-approved liquid-measuring system.

Variants: approved 24 September 1996

1. With up to 7 Email model Midas MAS units.
2. With an Email model MBD indicator.
3. With an Email Omega series computer.

Technical Schedule No S334 describes the pattern and variants 1 to 3.

Variant: approved 10 October 2000

4. With a DKI model MMAC unit.

Technical Schedule No S334 Variation No 1 describes variant 4.

FILING ADVICE

Supplementary Certificate of Approval No S334 dated 28 March 1997 is superseded by this Certificate, and may be destroyed. The documentation for this approval now comprises:

Certificate of Approval No S334 dated 15 January 2001
Technical Schedule No S334 dated 28 March 1997 (incl. Test Procedure)
Technical Schedule No S334 Variation No 1 dated 15 January 2001
Figures 1 to 4 dated 28 March 1997
Figures 5 and 6 dated 15 January 2001

Signed by a person authorised under Regulation 60 of the National Measurement Regulations 1999 to exercise the powers and functions of the Commission under this Regulation.

A handwritten signature in black ink, appearing to read "Jim Bennett". The signature is written in a cursive style with a large initial "J" and "B".

National Standards Commission

TECHNICAL SCHEDULE No S334

Pattern: Email Model Midas MAM Bulk Flowmetering Control System.

Submitter: Email Petroleum Systems
88-94 Canterbury Road
Kilsyth VIC 3175.

1. Description of Pattern

An Email model Midas MAM control system (Figure 1) for use in a Commission-approved liquid-measuring system.

1.1 The Controller (Figure 2)

The model Midas control system incorporates a model MAM (Midas Arm Master) controller with metrological firmware Version 1.3. The MAM has a preset facility, a calibration facility, an electronic volume conversion for temperature facility, and a multi-point linearisation correction facility.

The controller may be interfaced with up to eight Commission-approved flowmeters fitted with compatible Commission-approved pulse output devices; the flowmeters may be either positive displacement, turbine or mass type. A 100 Ω platinum resistance temperature probe (RTD) for each flowmeter may also be interfaced with the controller. The RTD is required for systems that employ volume conversion. When interfaced to a mass flowmeter the controller is configured to display measurements in mass units.

When the preset facility is used the controller shall be interfaced with the flow control valve in a Commission-approved liquid-measuring system. The preset facility is not for trade use and the preset display is so marked.

The maximum flow rate (L/min or kg/min) of the flowmeter shall be no greater than the result of 60 000 pulses per minute produced by the pulse output device, divided by the meter K-factor in pulses per litre or kg.

1.1.1 Calibration Facility

Calibration is achieved by means of a nominal K-factor setting in the range 0.1000 to 999.99 pulses per unit quantity.

1.1.2 Volume Conversion For Temperature Facility

The electronic volume conversion for temperature facility may be used to convert the measured volume to volume at 15°C, within the following ranges:

(a) When used with generalised products;

Density	654 kg/m ³ to 1074 kg/m ³
Liquid Temperature	-10°C to 50°C

(b) When used with liquefied petroleum gas (LPG);

Density	500 kg/m ³ to 580 kg/m ³
Liquid Temperature	-10°C to 50°C

Volume conversion for temperature to 15°C is mandatory for LPG.

The volume conversion is based on Table 54B (generalised products) or Table 54 (LPG) of the ASTM-IP *Petroleum Measurement Tables*.

NOTE: During normal operation, with the conversion facility enabled, the indicator displays unconverted volume, however converted volume, average temperature and the density at 15°C for which the volume conversion device is set, may be viewed after being accessed via the Service Function Mode Button, under the lockable flap shown in Figure 2. Alternatively the instrument may be configured to display the converted volume.

1.1.3 Volume Conversion Parameter Display

The density and average temperature may be obtained by two means:

(a) Via the service functions

The current density programmed and the average temperature of the last delivery may be obtained via the service functions with the following procedure:

- Open the lockable flap on the front of the MAM unit.
- Press the Service Function Mode Button to gain access to the service functions.
- Select the "Product functions".
- Use the "↓" key on the keypad to select the register desired.

"DENS"	Density
"DEG-A"	Average temperature of last delivery
- Press "CLR" to exit.

(b) Via the standard user functions

The user may if desired get information during the delivery on the product flow rate, product temperature, product density or K-factor, whilst in delivery mode, with the following procedure:

- Press the “0” key. The MAM displays the description of the field in the bottom (Interlock) row of the MAM display.
- Press the “←” or “→” key until the name of the desired parameter is displayed.
- When the desired parameter name is displayed, press the “↓” key to display the current value of the parameter. The “↑” key will then return to the parameter name display.

Press “CLR” to return to normal display. The normal display returns automatically when flow halts for any reason.

1.1.4 Linearisation Facility

The multi-point linearisation correction facility may be used to linearise the meter calibration curve as a function of flow rate.

Up to 5 field calibration meter factors (M-factors) as a function of flow rate can be programmed through the calibration function. Linear interpolation is used between the entered M-factors, up to a maximum input frequency of 1 kHz. These M-factors are specified as a variation from the nominal K-factor, and are usually in the range 0.990 to 1.010.

1.1.5 Display

A display check may be initiated via the Service Function Mode Button and once initiated it causes all segments to illuminate for approximately 5 seconds after which the display jumps to the idle indication.

Volume (resettable)	99999 units in 1.0 units
Preset (resettable)	99999 units in 1.0 units

Note: The totaliser function, which is accessed via the service functions, is a 9 digit value, but is viewed 5 digits at a time.

The preset value and the amount delivered can be displayed as whole numbers or with a permanent decimal point, marked on the display face (e.g. 999.99 units in 0.01 units).

The display shall be marked with approved units of measurement appropriate to whether the flowmetering system is measuring volume or mass

A 4-digit alphanumeric display for system status displays, error messages, etc., accessed via the service keypad for operator and manager prompts is also utilised.

1.1.6 Power Supply

The instrument operates with 240 or 110 V AC (nominal) mains supply. If power is disconnected, the displays are retained for a period of at least 15 minutes.

1.1.7 Controls and Indications

- (a) A display and keypad for selecting up to 8 loading-arms.
- (b) A manual (wipe-through type) magnetic card reader.

1.2 Operating Procedure

- (a) Connect the required interlocks.
- (b) Authorise the delivery via an authorised magnetic identification card.
- (c) Select the loading-arm and the compartment number if required.
- (d) Preset the required volume.
- (e) Commence the delivery by pressing the START button.

When all interlocks are disconnected, the transaction is considered complete.

1.3 Markings and Notices

- (a) The following information shall be clearly and permanently marked on one or more permanently attached nameplates:

Manufacturer's name or mark	
Model number	
Serial number	
NSC approval number	NSC No S334
Liquid density range (*)-..... kg/m ³
Density for which the conversion device is set kg/m ³

- (*) Mandatory when volume conversion for temperature facility is used.

- (b) The preset display is marked 'Preset Indication Not For Trade Use'.
- (c) When displaying the converted volume, the indicator reading face is marked 'Volume Delivered Converted to 15°C', or 'Litres at 15°C', or 'Reference Temperature 15°C'.

1.4 Verification/Certification Provision

Provision is made for the application of a verification/certification mark.

1.5 Sealing Provision

Provision is made for sealing the "Calibration mode" button, which is under the lockable flap on the front of the MAM unit (Figure 2).

2. Description of Variants

2.1 Variant 1

The Midas control system may incorporate up to 7 Email model MAS (Midas Arm Slave) display units one for each flowmeter. The MAS units look the same as the MAM units shown in Figure 2, except that they are marked 'MIDAS MAS' rather than 'MIDAS MAM'. Figure 3 shows a typical system for this variant and including variants 2 and 3. The MAS units have no controlling functions.

The preset facility is not for trade use and the preset display is so marked.

Systems may include a Midas Annunciator Panel which is a display device only.

2.2 Variant 2

The Midas control system may incorporate a model MBD (Midas Bay Display) unit (Figures 3 and 4) which may be used for data entry as well as showing loading arm status.

2.3 Variant 3

The Midas controller may be interfaced with an Email model Omega 3000 supervisory computer (Figure 3) which uses a UNIX operating system. The Omega computers are also described in the documentation of NSC approval No S191A. The computer uses Release 7.0 (or later) software, depending on the administrative and management facilities provided. The release number is displayed on the Omega VDU, within a window on the top-left-hand side of any standard character-based login.

The converted volume, average temperature and density setting are also recorded on the supervisory computer, and printed on the data logger.

The Omega computer system passes various parameters such as K-factors, meter factors, density factors, and flow profile settings to the controller when necessary. Every time this occurs, a data logger records the event both electronically and by printing to the logger.

TEST PROCEDURE

Instruments shall be tested in conjunction with any tests specified in the approval documentation for the instrument to which the pattern is connected, as appropriate, and in accordance with any relevant tests specified in the Inspector's Handbook.

Maximum Permissible Errors at Verification/Certification

The instrument is approved for use as accuracy class 0.5 in loading-rack installations.

The maximum permissible errors applicable are:

For loading-rack systems (class 0.5);

- ±0.5% for converted volume; and
- ±0.3% for unconverted volume; and
- ±0.2% for the conversion device.

Reference conditions for petroleum liquids are specified in Australian Standard 2649 - 1983, *Petroleum Liquids and Gases - Measurement - Standard Reference Conditions*.

1. The meter should be tested against a proving device for unconverted volume.
2. Check the volume for temperature conversion using Table 54B (generalised products) or Table 54 (Liquefied Petroleum Gas) of the ASTM-IP *Petroleum Measurement Tables*.

TECHNICAL SCHEDULE No S334
VARIATION No 1

Pattern: Email Model Midas MAM Bulk Flowmetering Control System.
Submittor: Diamond Key International Pty Limited
110 Henderson Road
Rowville VIC 3178.

1. Description of Variant 4

The DKI model MMAC (Midas Multi Arm Controller) unit (Figure 5) which houses a model MAM (Midas Arm Master) controller (as described for the pattern) and up to 5 model MAS (Midas Arm Slave) units (as described for variant 1) allowing the MMAC to be used with up to 6 loading arms.

Figure 6 shows a typical system incorporating an MMAC, as well as items described for variants 2 and 3.

The pre-set facility is not for trade use and the pre-set displays are so marked.

Provision is made for sealing the calibration mode button located under the lockable flap on the side of the MMAC housing.



National Standards Commission
Notification of Change
Supplementary Certificate of Approval No S334
Change No 1

The following change is made to the approval documentation for the

Email Model Midas MAM Bulk Flowmetering Control System

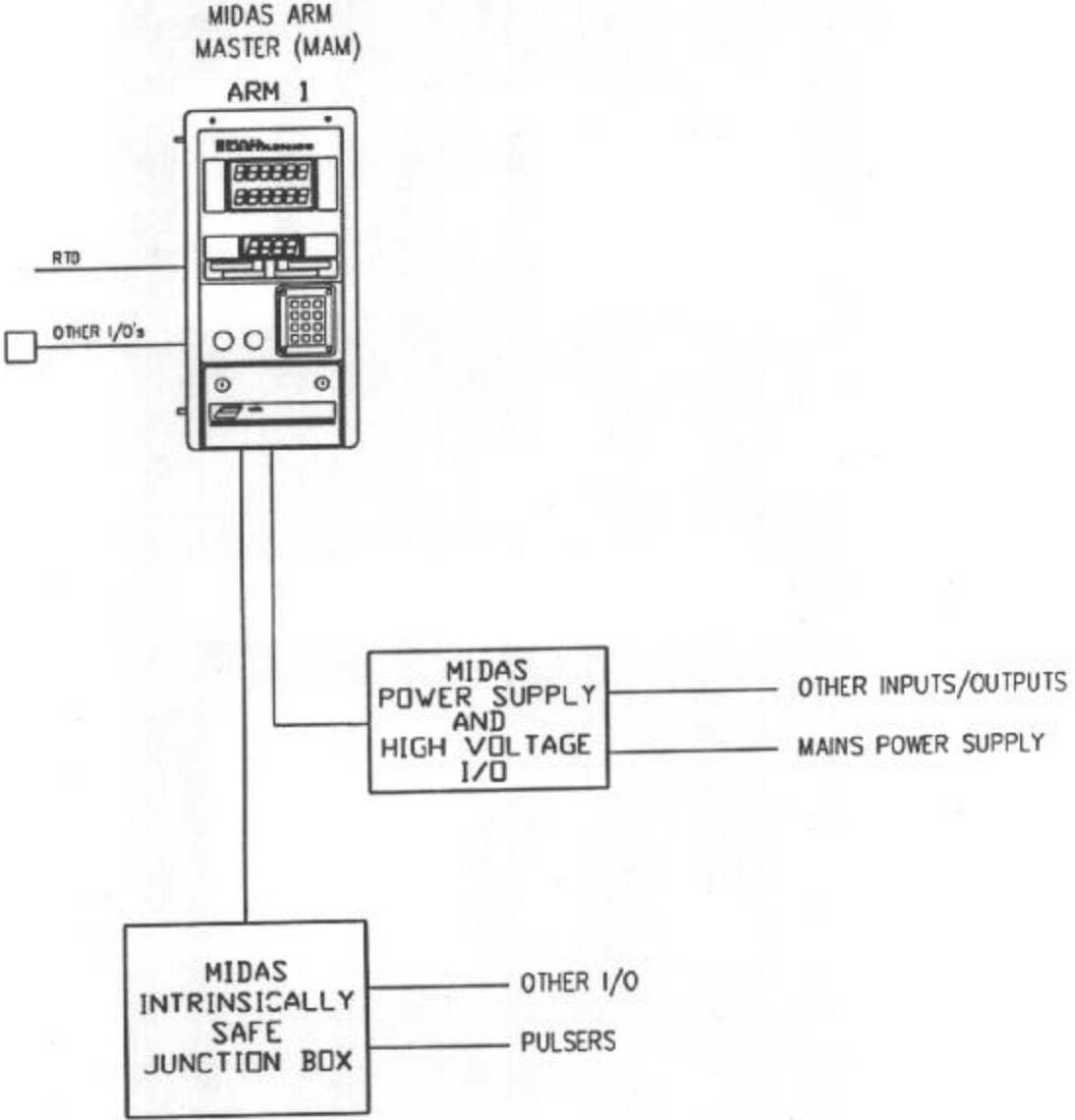
submitted by Email Petroleum Systems
88-94 Canterbury Road
Kilsyth VIC 3137.

In Supplementary Certificate of Approval No S334 and its Technical Schedule, both dated 28 March 1997, all references to the submitter should be amended to read;

Diamond Key International Pty Limited
110 Henderson Road
Rowville VIC 3178.

Signed and sealed by a person authorised under Regulation 9 of the National Measurement (Patterns of Measuring Instruments) Regulations to exercise the powers and functions of the Commission under this Regulation.

FIGURE S334 - 1



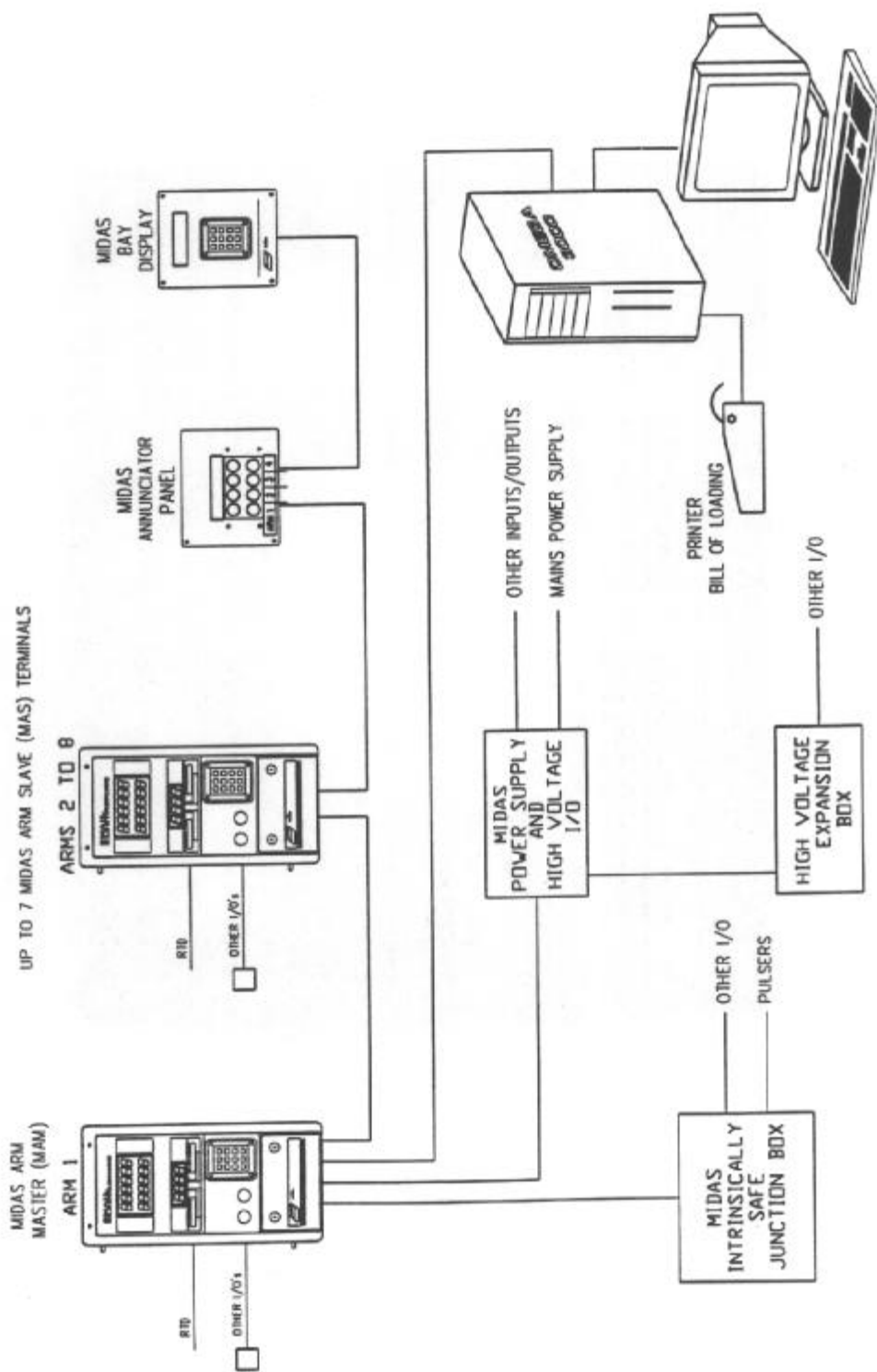
Typical Email Midas MAM System

FIGURE S334 - 2



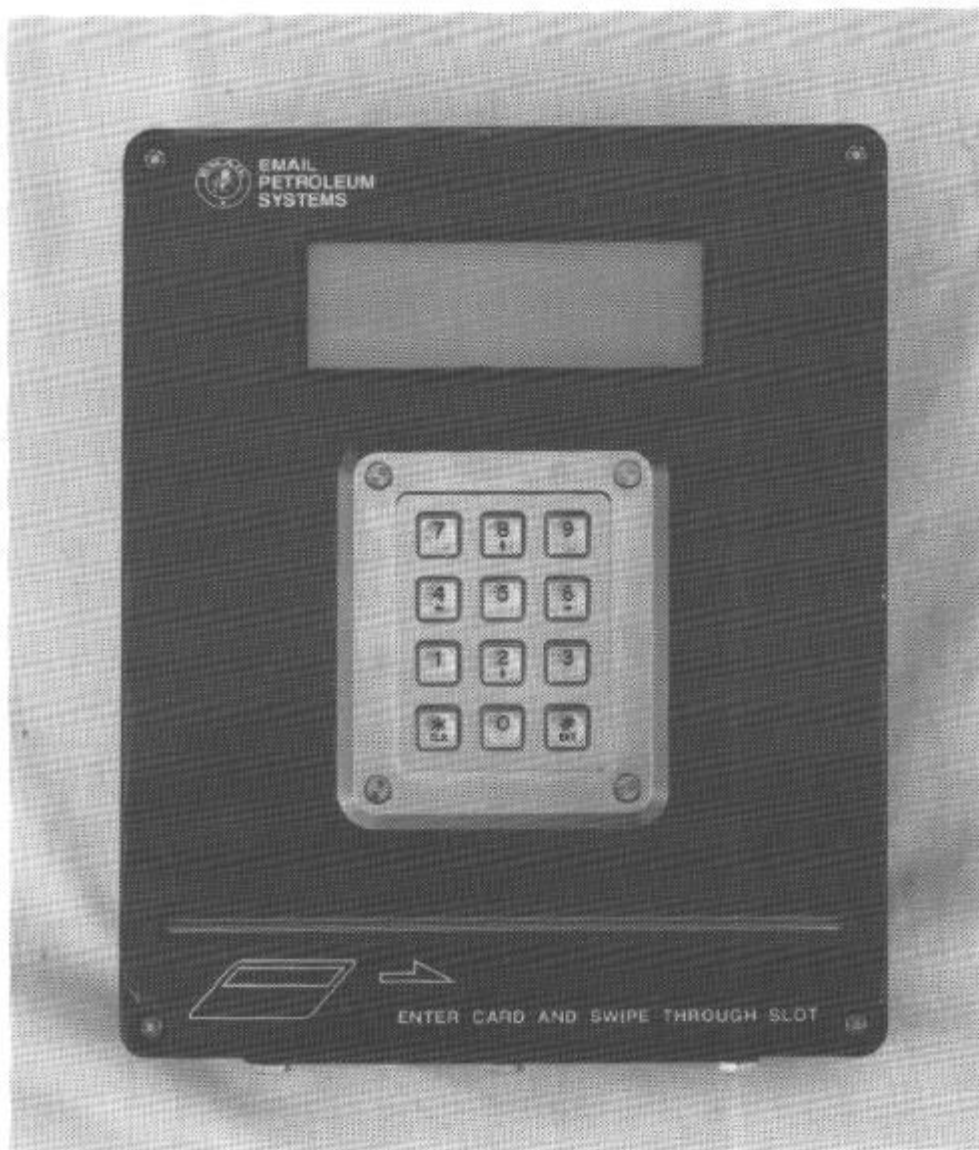
Email Model Midas MAM Controller

FIGURE S334 - 3



Typical Email Midas MAM/MAS System

FIGURE S334 - 4



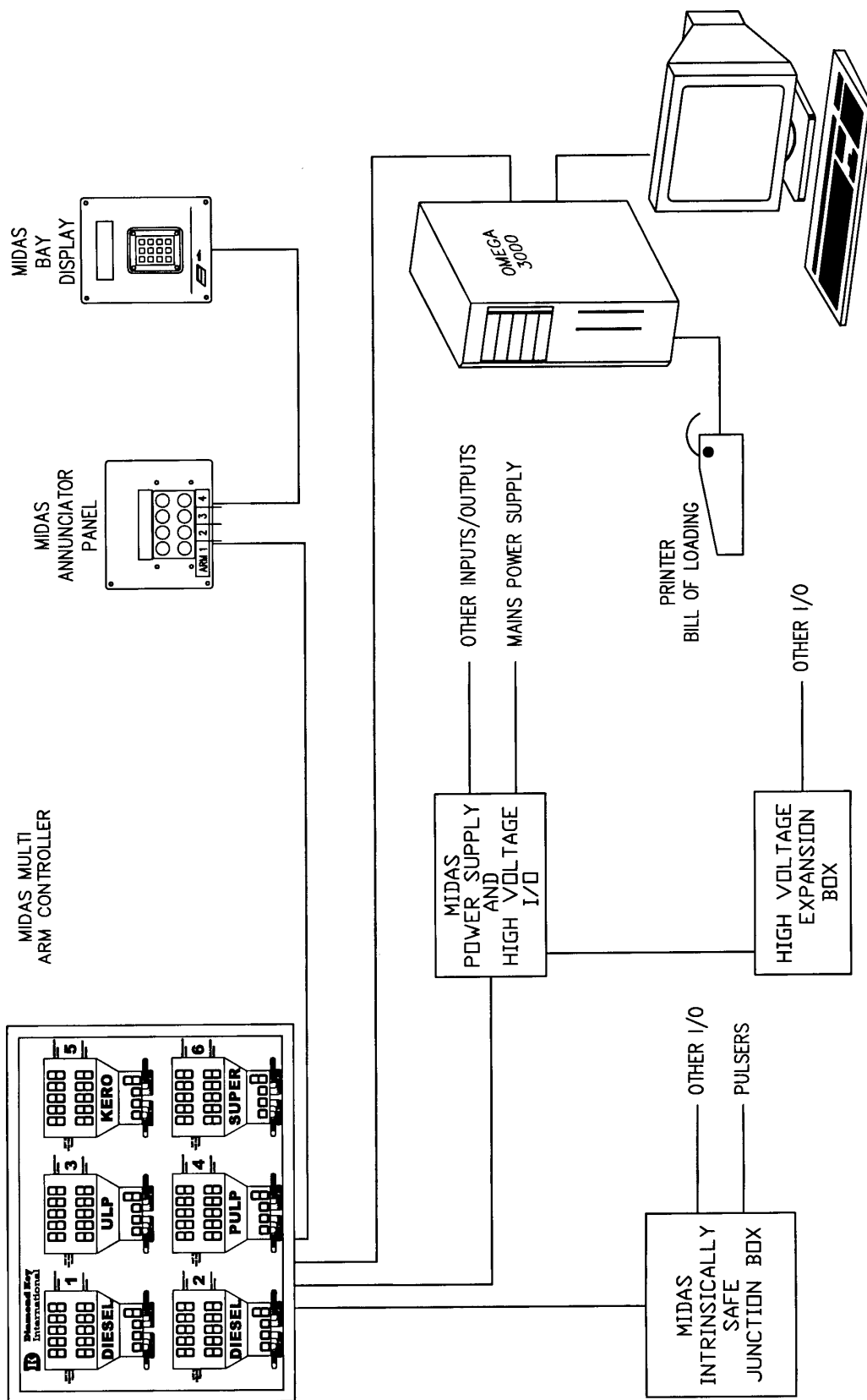
Email Model Midas Bay Display

FIGURE S334 - 5



Typical DKI Model Midas MMAC Unit

FIGURE S334 - 6



Typical DKI Midas MMAC System