contrec

Load Computer

Model 1010 A

Features

- **Stand-alone or Integrated System operation**
- **1-Arm to 4-Arm simultaneous loading**
- **CENELEC and USA/Canadian Hazardous Area approval**
- **PIN or optional Touch Key Authorisation**
- **Temperature Compensation to API Tables**
- **Stores last 200 Transaction Reports**
- **Isolated RS485 Port Second RS485/422/232 Port**
- **5 Point K-Factor Linearity Correction for Flowmeters**
- **Fully Programmable with a sealable metrology switch.**

Overview

The 1010A is a powerful and intelligent loading system designed to manage the loading of petroleums and chemicals onto road tankers, rail cars and barges.

The 1010A offers the advantages of a robust explosionproof enclosure, large dot matrix display and alphanumeric keyboard. The 1010A can handle simultaneous loading on up to 4 arms.

The large backlit dot matrix LCD will display up to four separate totals as well as showing preset values, flowrates, operator prompts, and other operational information.

The 1010A also features an integrated Touch Key reader and an isolated RS485 communications port which eliminates the problems of earth loops and reduces electrical noise.

Applications

The Model 1010A is available with a range of *Applications Packs*, consisting of application software and hardware designed to meet the specific requirements of:

- Standard petroleum loading
- Loading aircraft refuelling trucks
- Railcar loading
- Chemical loading
- Bitumen & asphalt loading
- Chinese & other language displays

In addition, Contrec has developed a number of special *Application Packs* to meet the needs of customers in different countries or where non-standard requirements exist.

Communication protocols include the Contrec SLIP protocol for reliable and secure transmission of data, as well as an industry standard protocol (TOPS) which enables the two arm version of the 1010A to directly replace other electronic presets.

www.contrec.com.au

Load Computer

1010 A

Standalone or Integrated System

The Model 1010A can operate in a stand-alone mode or integrate with a terminal automation system.

Standalone

In the Stand-Alone mode, the Model 1010A will provide complete control of the loading rack, including:

- Authorising drivers & vehicles
- Prompting the driver to enter arm number, compartment number and preset quantity
- Prompting and checking that the vehicle earth or overfill is connected
- Simultaneous loading of up to 4 arms

The Model 1010A will manage all loading operations for single or multi-compartment vehicles and produce a bill of lading for the entire vehicle.

The last 200 vehicle loads are always stored in memory, so that tickets can be re-printed or transactions downloaded to a computer system at a later date.

Integrated System

Because the system is capable of authorising vehicles and generating prompts without reference to the automation system, the communication workload on the office computer is substantially less than if these functions were fully controlled by the automation system, as is the case with most other presets.

This means that the cost of developing software drivers and automation programs is greatly reduced.

The standard protocol used in the Model 1010A is SLIP, originally developed for the internet, because it provides a very reliable, secure and efficient method to transfer information to the office computer system. SLIP conforms to the International Standards Organisation OSI recommendations for multi-layered protocols.

Alternative Protocol

An alternative protocol to SLIP is an industry standard protocol, termed TOPS. The TOPS protocol is available for 2 arm versions of the 1010A and enables the system to directly replace other presets, in many applications.

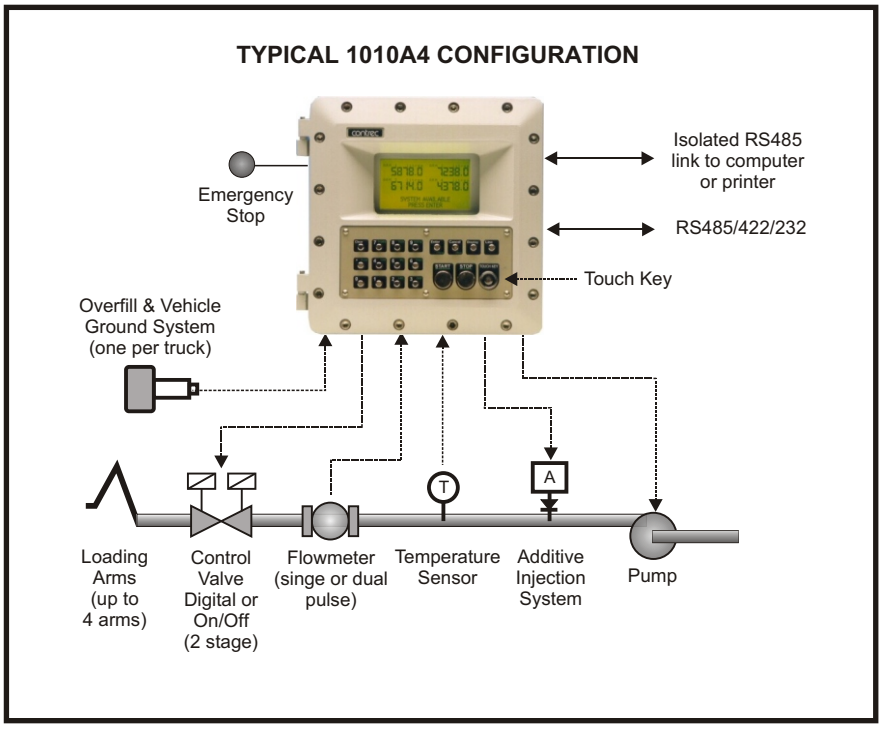
With TOPS protocol much of the standalone functionality is lost as all messaging and control is passed across to the terminal automation computer system. Essentially, the 1010A becomes a two channel batch controller when operated in this mode with the added capability of an operator display, keyboard and Touch Key reader - all controlled by the automation system.

Touch Key Technology

Touch Key technology offers a rugged and secure method of identification for both drivers and vehicles.

The Touch Keys produce a coded number, similar to a magnetic card, that can be read by the Model 1010A. Unlike magnetic cards, however, the Touch Key numbers will not be corrupted through heavy use. Each key has a unique identification number laser etched into a microchip that will transmit the number when the key is momentarily pressed against the reader.

Driver or vehicle authorisation can be granted by the Model 1010A via a database of valid key numbers stored internal to the system. Alternatively, the key number can be sent to the office automation computer for authorisation.



Touch Keys are available as a key ring tag in a number of colours or as a card, where the actual touch button is mounted on a plastic card or badge, of similar size to a magnetic card.

Standard Touch Keys do not have a battery and have an unlimited life span. The keys receive a very small amount of power from the reader, which is mounted on the front panel of the Model 1010A. An intrinsically safe isolation barrier inside the Model 1010A limits the power to microwatts, and both the keys and the reader are internationally certified for use in hazardous areas.

Functionality

The Model 1010A has all the flow measurement and control functions expected of a leading preset. These include:

- Precision flow measurement, including pulse verification to API and ISO standards.
- Temperature Measurement
- Volume Correction to API tables for most petroleum products and to US and metric standards.
- Digital Valve Control.
- Additive Control outputs
- Pump demand outputs with programmable delays.
- Permissive inputs for overfill, vehicle ground and emergency stop
- Pulse Outputs
- Other digital inputs/outputs specific to user requirements.

The digital control output enables the flow profile to be programmed to ramp up at the start of the load and to ramp down prior to the end of the load.

With our field proven fine-tuning algorithm, accurate control of flowrate is ensured for all major brands of digital control valves.
.

PRODUCT CODES

MODEL	SUPPLEMENTARY CODE							DESCRIPTION
1 0 1 0 A	**-**					**-**		
Number of Arms	**1**							Number of Loading Arms
	to							
	4							
Application Pack		**B S**						Application software & input/output card combination
		B A						- refer Application Pack Brief for more details
		etc.						
Authorisation			**0**					None or PIN
			2					Touch Key
Glands, Approvals and Heater Option for the Enclosure				**A**				SAA Approved with 5 x M25
				C				CSA NRTL/C 2 x 1.¼“ NPT & 1 x 1” NPT
				D				CSA as above but with heater
				M				Cenelec Enclosure with 5 x M25
				N				Cenelec as above but with heater
Power Supply					**1**			110 Vac
					2			220 Vac
					3			dc Volts
Display Type & Units of Measure						**N**		Dot Matrix Display - Programmable Units
						S		Special Type
Metrology Approval							**0**	None
							1	Australian NSC
							2	Canadian Weights & Measures
							3	NMI OIML R117
							4	USA NIST

Modular Design

The modular design of the electronics simplifies servicing. Should a fault develop in the electronics, modules can be simply changed over in the field by technicians with minimal training.

The need for highly specialised personnel and/or costly maintenance contracts is eliminated providing terminals and depots with a level of self-sufficiency otherwise not available.

Approvals

The Model 1010A complies with international metrology approvals including:

- European approvals to the OIML R117 standards with certification through NMI and PTB
- US NIST approval
- Canadian approval
- South African SABS
- Australian NSC

Hazardous area approvals for the enclosure include:

- European Approval
  Cenelec EEx d IIB T6
- USA & Canadian
  $CSA_{US/C}$ for Class 1, Goups C & D

Approvals for the Touch Keys, Reader and barrier include:

- European Approval
  Cenelec EEx d [ia] IIB T5
- USA & Canadian
  $CSA_{US/C}$ for Class 1, Goups C & D

CE & EMC standards

- EN50081-1 & EN50081-2,
  EN50082-1 & EN50082-2

Programmable Set-Up Parameters

General

Driver Authorisation	Touch Key/PIN/None
Truck Authorisation	Touch Key/PIN/None
Password Protection	Multi-level password protection
Time and Date	Year/Month/Day/Hours/Minutes
Volume Decimals Display	0.1 or 1
Accumulated Totals	Gross/Net

Valve Control

No Flow Timeout	0 to 999s
Valve Type	Digital Set/Stop or On/Off
Slow Flow	xxx l/m or g/m
Deadband	30 to 500 l/m or g/m
Response Time Factor	0.2 to 1.0
Slow Start Time	0 to 99s
Prestop Quantity	0 to 999 litres or gals
Maximum Preset Quantity	up to 99999 litres or gals

Arm Input (for each arm)

Pulse Type (Flowmeter)	Single or Dual
Dual Pulse cut-off frequency	0 to 99Hz
K-factor - Linear	Single point 0.001 to 50000.0
- Non-linear	5 points 0.001 to 50000.0
Temperature Compensation	None/Jet Fuel/Gasoline/Diesel/Crude Oil Calculations are exact to API Std. 2540
Fluid Temperature Range	-10 to 50°C
Flowrate at Full Flow	xxxx l/m or g/m
Additive Output Pulse Rate	per 0 to 9999 litres or gals
Overrun Correction Amount	xxx litres or gals
Accumulated Total	0 to 99999999

Communications

Communications Device	Computer or printer
Load Scheduling	Enable/Disable (Computer only)
Communication Mode	RS232/RS422/RS485
Baud Rate	300 to 28,800
Parity	Odd/Even
Stop Bits	1 or 2
Gantry Number or Unit Address	1 to 31

Additive Injector

Additive Injector Type	Piston or Contrec 1020 Intelligent Injector
Pulse Output	Open Collector or 110/240V ac
Additive Pulse	0.5 to 10s
Number of 1020 Injectors	Up to 4 injectors per arm

Other Options

Initial Message	System Available, Connect System Connect Overfill
Deadman Timer	Enable/Disable
Illegal Access	Enable/Disable
Alarm on Fault	Enable/Disable
Ask Load Number	Enable/Disable
Ask Compartment Number	Enable/Disable
Ask Return Quantity	Enable/Disable
Ask Trip Number	Enable/Disable
Expansion Mode	Enable/Disable
Keyboard Timeout	20 to 999 Seconds
Overfill/Earth Reconnect	20 to 999 Seconds

SPECIFICATIONS

contrec

1010 A

Note that some specifications may vary depending on the application. Refer to the *Application Pack Briefs* for more details.

Physical

Displays

Alphanumeric: 112 x 62 mm backlit dot matrix LCD.
Note: Contrast can be adjusted via keypad.

Batch Total: 6 digit (10mm high) backlit LCD with automatic ranging.

Keypad Buttons

Switches: Flameproof with heavy duty actuators. 11 alphanumeric and 7 function keys.

Materials: Stainless Steel.

Weights & Measures Seal: A program access switch, located on the side of the enclosure, can be affixed with a lead seal to prevent tampering.

Enclosure

Dimensions: 302mm (w) x 288mm (h) x 326mm (d).

Material: Powder coated aluminium.

Sealing: IP66 (Nema 4X) weatherproof, fully O-ring sealed.

Mounting: Four 8 x 1.5 mm metric or 5/16" UNF threaded holes top and bottom.

Weight: Single enclosure - 22.5 kg (approx). Shipping weight - 23.0 kg (approx).

Cable Connection: Five 25mm x 1.5mm metric threaded holes or 2 x 1¼" and 1 x 1" NPT holes.

Touch Key/Magnetic Card Reader

Material: Stainless Steel & Delrin

Operational

Power Requirements

110V ac +10% -15%, 50/60Hz.
220V ac +10% -15%, 50/60Hz.

Operating Temperature (Ambient)

-10 to 60°C (-40°C with optional heater).

Communications

Computer/Printer: RS232/RS422/RS485 or isolated RS485

Expansion Port: RS232/RS422/RS485
Port configuration may depend on the Application Pack.

Interference CE Compliance.

Inputs and Outputs

Flow Inputs

Input Frequency: 0 to 2000Hz. Single or dual (quadrature) inputs on each channel.
0 to 8000Hz optional (non OIML units only)
Note: Dual pulse is for pulse verification only and does not detect reverse flow.

Pulse Integrity: (Dual pulse only) If a pulse failure is detected the system will alarm and stop flow on that channel.
Note: This is in accord with API Standards Chapter 5, Section 5, AS2702 and ISO6551.

K-factor - Linear: Single point 0.001 to 50000.0
- Non-linear: 5 points 0.001 to 50000.0

Temperature Inputs

Input Signal: 4-20mA or 4 wire RTD
Range: -10 to 50°C.
Input Circuit: 12 Bit A/D converter.
Correction: To API Table 24B/54B for gasoline, diesel, Jet fuel and Table 24A/54A for crude oil.

Overfill and Ground Inputs

Switched input from floating contact.
Note: Relays on the overfill and ground systems must be floating (ie. not connected to other circuits) and suitable for switching low voltage signals.

Emergency Stop Inputs

Switched input from floating contact.
Note: Switches or relays on this input must be floating (ie. not connected to other circuits) and suitable for switching low voltage signals.

Valve Control Outputs (2 stage on/off or digital control valves)

8 x Isolated Solid State Relays (SSRs) rated 1A @ 240V ac.

Min. contact voltage:	24V ac
Max. contact voltage:	265V ac
Optical Isolation:	2500Vrms
Current range:	0.02 to 1A ac
Max. surge current:	20A ac
Max. off-state leakage current:	20mA ac

Note: SSR are not suitable for switching dc voltages.

Additive Outputs (one per loading arm)

Conventional Piston Injector:
SSR rated 1A @ 240V ac

1020 Intelligent Additive Injector:
Open collector transistor. 100mA (max) and 28 Volt dc (max).

Pump Demand Outputs (one per loading arm)

Electromechanical relay rated at 1A @ 240V ac or 24V dc.

Alarm Outputs 1 x Electromechanical relay rated at 1A @ 240V ac or 24V dc.

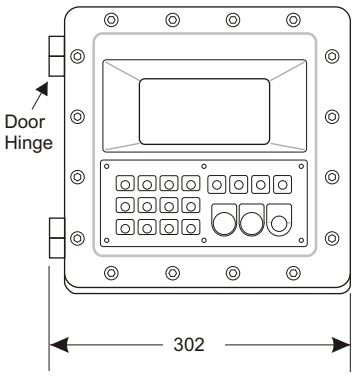
Power Outputs: 12V dc for flowmeters (150mA max)
24V dc for temp. sensors (100mA max)

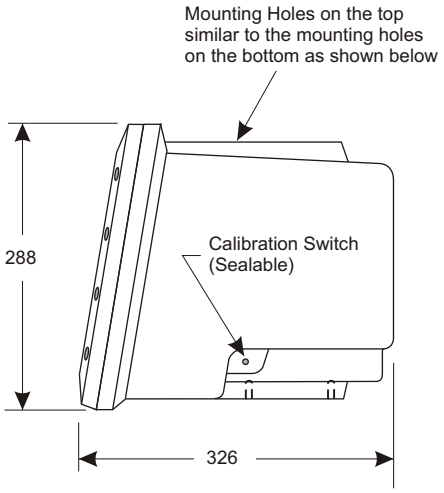
Important: Specifications are subject to change without notice.

1010 A

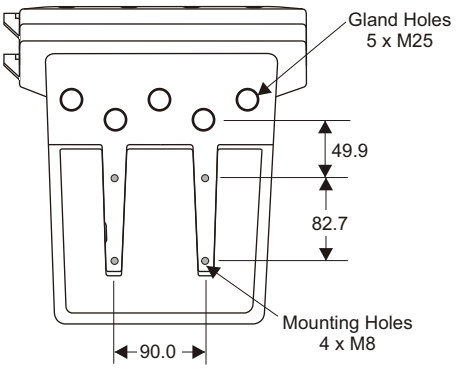
Material: Cast Aluminium
Finish: Light beige powdercoat

Dimensional Diagrams

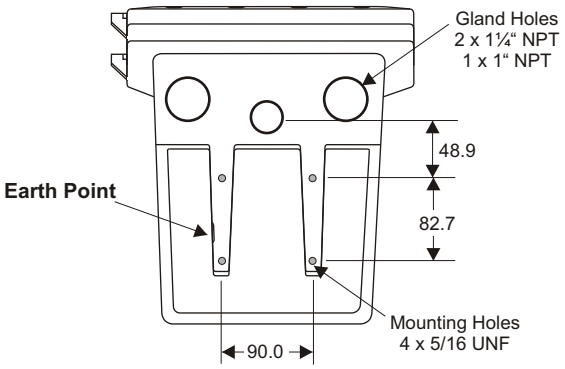




Bottom View



Enclosure with 5 x M25 Gland holes



Enclosure with 2 x 1¼" NPT and 1 x 1" NPT Gland holes

Website: www.contrec.com.au

A C C U R A C Y • Q U A L I T Y • P E R F O R M A N C E

Distributed by:

Contrec Pty Ltd
22 Hall Street Hawthorn East, Melbourne 3123 AUSTRALIA
Tel: +61 3 9822 8966 Fax: +61 3 9822 8329
Email: sales@contrec.com.au

Contrec - USA, LLC
916 Belcher Drive Pelham AL 35124 USA
Tel: (205) 685 3000 Fax: (205) 685 3001
Email: contrec@contrec-usa.com

Contrec Europe Limited
PO Box 436 Halifax HX1 2WG, UK
Tel: +44 1422 254 024 Fax: +44 1422 254 025
Email: sales@contrec.co.uk

Website: www.contrec.com.au

1010 Ads-13/12/00