



## Power, intelligence and accuracy for loading operations.

The 1010 C series Load Computer gives you smart control of the loading procedure on up to four arms at petroleum refinery and oil marketing terminal gantries. For custody transfer to road tankers, railcars and barges, it offers all the measurement and control functions needed for chemicals, bitumen, asphalt, LPG and more. Offering flow measurement with pulse verification to API and ISO standards, temperature and volume correction, and digital valve control, it also has advanced functionality. Benefit from configurable I/O, touch key card readers and smart additive connectivity to Honeywell Enraf injection systems. Flexible, intelligent and easy to use, it's another load off your mind.

**Global Experience. Locally Applied.**

Simultaneously controlling up to four arms, our load computer provides a wide range of functionality built for ease of use, low cost of ownership and intelligent integration.

# A Flexible, Scalable Answer

## Flexible and Powerful

- Customizable
- Multi-language UI
- Standalone mode
- 16 recipes for additives
- 512 transaction log

## Precise and Compliant

- Temperature and pressure correction
- Built according to API MPMS standards

## User Friendly

- Flash downloadable firmware
- Configurable I/O
- Large backlit LCD with adjustable contrast
- 18 alphanumeric keys

## Resilient

- Rugged push buttons
- Explosion proof NEC 500/505
- Flame-proof ATEX & IECEx
- Diagnostics program

## Integrated

- Interfaces with Terminal Manager, MiniPak 3000, MiniPak 6, MSC-A and SSC-A
- Three isolated communication ports

## Secure

- Integrated touch key reader
- Honeywell NexWatch card reader
- Local or remote authorization
- Driver and truck ID (2,750 each)
- Illegal access lockout
- Multi-level security with password protection

Customize it to your needs. Suitable for a wide range of petrochemical products, special application packs can be tailored for specific operating areas. Use in Stand Alone mode or integrate into your terminal automation system for local or remote authorization.

## Precision Control

Control the flow profile with digital valve control to ramp up at the start of the load and down towards the end, while field proven fine-tuning algorithm ensures accurate control for all major brands of digital control valves. Five point linearity correction means flow signals from a wide range of flow meters are measured accurately.

## Built According to API MPMS Standards

An MID and NTEP approved design and precision flow measurement, including pulse verification to API standards.

## Integration Options

Interfaces with Honeywell Enraf's Terminal Manager as well as with the MiniPak 3000, MiniPak 6, MSC-A and SSC-A controllers. Three isolated communication ports provide high immunity in noisy environments to

communicate with terminal automation systems, SMART additive controllers, NexWatch card reader and printers.

## Easy to Use

Easy to install, configure and operate. Configurable I/O, Flash downloadable firmware and a powerful diagnostics mode simplify commissioning and fault-finding. Each input and output can be individually tested or activated to ensure the wiring and interface are correct prior to running a complete load. It also features a user-friendly configuration menu, customizable features and large backlit LCD display.

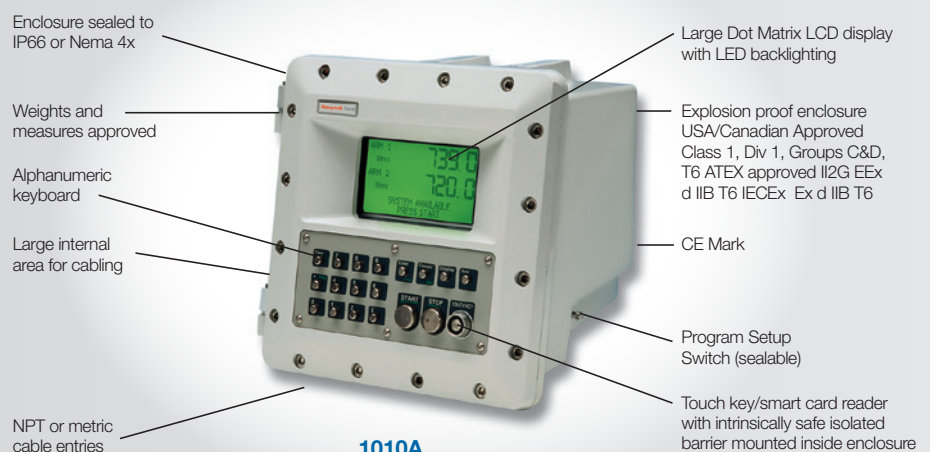
## Safe and Secure

The keys and the reader are internationally certified for use in hazardous areas. Security functions include illegal access lockout and multi-level security settings with password protection.

## Built to Last

A resilient design includes ruggedized truck-driver-proof keyboard, and the compact and robust explosion proof enclosure. The touch keys, meanwhile, aren't corrupted by heavy use, unlike magnetic cards.

## Typical 1010Ax-CJ configuration



1010A

# Advanced Functions

The 1010C features a range of advanced flow measurement and control functions for complete control of the loading and unloading operation:

- Digital valve control
- Additive control outputs
- Pump demand outputs with programmable delays
- Overfill/Ground Input/Vapour Recovery
- Programmable permissive inputs
- Programmable Outputs (for alarms)
- Programmable Inputs (for pause/terminate commands)
- Emergency stop function
- Configurable I/O

## Independent Operation

Stand-Alone mode provides a low-cost loading system for unmanned bulk stations. The 1010 can provide complete control of the loading rack, with simultaneously loading on up to 4 arms:

- Authorizing drivers and vehicles
- Prompting entries for arm number, compartment number and preset quantities
- Prompting and checking connections for vehicle earths and overfill

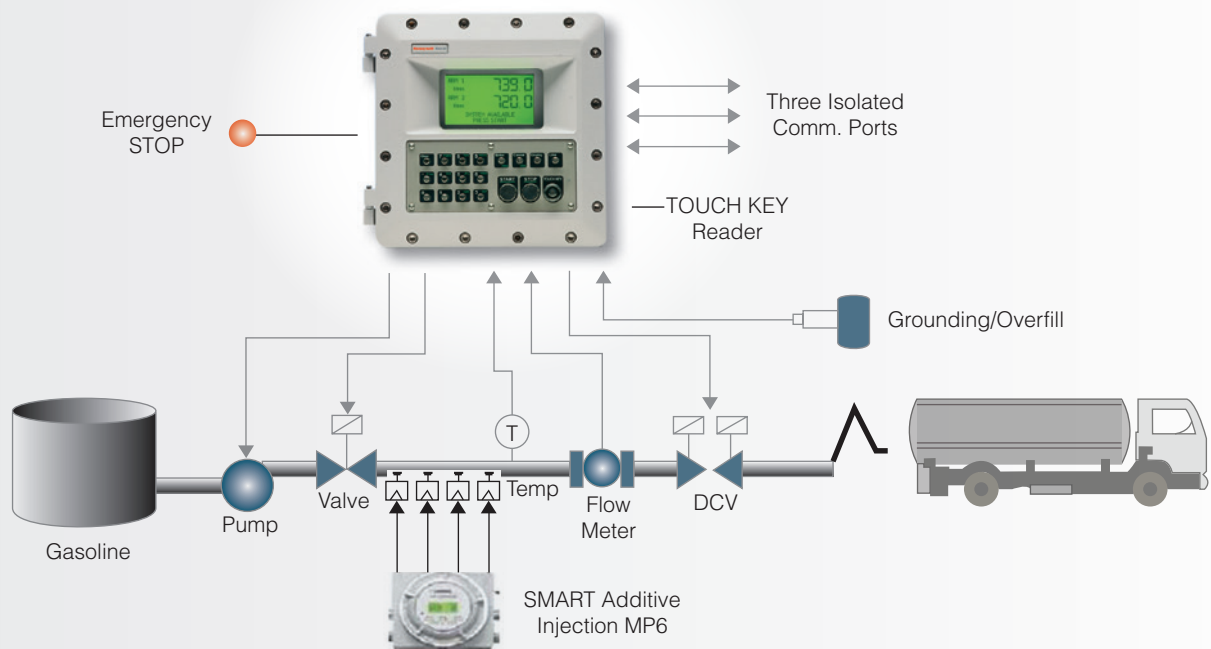
Able to manage both single or multi-compartment vehicles and produce a bill of lading for the entire vehicle, the 1010 C can store the last 512 vehicle loads in memory. Tickets can be re-printed or transactions downloaded to a computer system at a later date, and by handling it all independently, without reference to the automation system, the workload on the office computer is significantly reduced.

When connection is needed, the 1010 uses the SLIP+ protocol originally developed for the internet for highly reliable, secure and efficient information transfer.

## A Touch More Reliable

The 1010 Load Computer uses touch key technology for secure, reliable and resilient identification and access control.

Identification keys transmit a unique number laser etched onto their microchip that is read by the load computer when pressed against the reader. Authorization can be granted by the 1010 against a database of valid key numbers stored internally or by the office automation computer. With no battery and an unlimited lifespan, touch keys are available as a key ring tag in a number of colours or with the touch button mounted on a plastic card or badge.



## Programmable Set-Up Parameters

Valve Control	
No Flow Time out	0 to 999 s
Valve Type Digital	Digital/Two-stage
Slow Flow	200 to 800 L/min or U.S. gallon/min
Deadband	1 to 500 L/min or U.S. gallon/min
Response Time Factor	0.2 to 1.0
Slow Start Time	0 to 99 s
Prestop Quantity	0 to 999 L or U.S. gallons
Max. Preset Quantity	0 to 9999999 L or U.S. gallons
Arm Input (for each arm)	
Pulse Type (Flow meter)	Single or Dual
Dual Pulse cut-off freq.	0 to 99 Hz
K-factor	– Linear: Single point 0.001 to 50000.0 – Non-linear: 5 points 0.001 to 50000.0
Temp. Correction	Temperature Volume correction as per the ASTM D1250-04
Fluid Temperature Range	-50 °C to +150 °C (-58 °F to +302 °F)
Pressure Correction	0 to 9.3 MPa (0 to 1355 psi)
Flow rate at Full Flow	3000 L/min or U.S. gallon/min
Additive Output Pulse Rate	per 0 to 999 L or U.S. gallons
Overrun Correction Amount	250 L or U.S. gallons
Accumulated Total	0 to 99 999 999
Communications	
Communications Device	TAS/printer/SMART Additive/NexWatch
Load Scheduling	Standalone/Load Scheduling
Communication Mode	RS232/RS422/RS485 (RS422 Port1 only)
Baud Rate	300 to 38400 kBd
Parity	None/Odd/Even
Stop Bits	1 or 2
Gantry Number or Unit Address	1 to 31
Outputs	
Additive Injector Type	Piston or MP3000/MP6; SSC-A and MSC-A
Pulse Output	110/240 Vac
Additive Pulse	0.5 to 10 s
Number of injectors	Up to 4 SMART injectors per arm
Pump Off Delay	0 to 999 s
Other Options	
Initial Message	– System Available – Connect System – Connect Overfill
All ENABLE/DISABLE options:	– Test Mode: Ask Load Number – Automated Proving: Simultaneous Arm Loading – Illegal Access: Multiple Loads Per Arm – Alarm on Fault: Ask Preset Quantity – Ask Compartment No: Max Preset Quantity – Ask Return Quantity: Deadman Timer

## Technical Specifications

Physical	
Enclosure Dimensions	302 mm x 288 mm x 326 mm (WxHxD)
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 25 mm x 1.5 mm metric threaded holes or 2 x 1 1/4" and 1 x 1" NPT holes
Operational	
Power Requirements	95 to 135 Vac, 50/60 Hz; 190 to 260 Vac, 50/60 Hz
Operating Temperature (Ambient)	-10 °C to +60 °C (-40 °C with optional heater)
Communications	Computer/Printer/MiniPak/NexWatch: RS232/RS422/RS485 (RS422 Port 1 only)
Inputs and Outputs	
Flow Inputs Input Frequency	0 to 2000 Hz. Single or dual (quadrature) inputs on each channel <i>Note: Dual pulse is for pulse verification only and does not detect reverse flow.</i>
Pulse Integrity	(Dual pulse only) If a pulse failure is detected the system will alarm and stop flow on that channel. <i>Note: This is in accordance with API Standards Chapter 5, Section 5, AS2702 and ISO6551, Level B.</i>
K-factor	Linear: Single point 0.001 to 50000.0; Non-linear: 5 points 0.001 to 50000.0
Temperature Inputs Input Signal	4-20 mA or 4 wire RTD
Range	-50 °C to +150 °C (-55 °F to +302 °F)
Input Circuit	16 bit A/D converter
Volume Correction	<p>Temperature and pressure volume correction as per the API MPMS Chapter 11.1:</p> <ol style="list-style-type: none"> <li>1. Refined (Tables 24B, 54B and 60B)</li> <li>2. Crude Oils (Tables 24A, 54A and 60A)</li> <li>3. Lube Oils (Tables 24D, 54D and 60D)</li> </ol> <p>Temperature volume correction as per the API MPMS Chapter 11.1, Special Application:</p> <ol style="list-style-type: none"> <li>4. Gasohol (using thermal correction factor)</li> <li>5. MTBE (using thermal correction factor)</li> </ol> <p>Generic thermal correction factor based on the ASTM D1250-04 calculations:</p> <ol style="list-style-type: none"> <li>6. Manual entry of correction factor temperature volume correction as per the Manual of Petroleum Measurement Systems (MPMS) for Light Hydrocarbon Liquids (Chapter 11.2.4)</li> </ol>
Pressure Inputs Input Signal	4-20mA
Range	0 to 9.3 MPa (0 to 1355 psi)
Input Circuit	16 bit A/D converter
Overfill and Ground Inputs	Switched input from floating contact <i>Note: Relays on the overfill and ground systems must be floating (i.e. not connected to other circuits) and suitable for switching low voltage signals</i>
Emergency Stop Input	Switched input from floating contact <i>Note: Switches or relays on this input must be floating (i.e. not connected to other circuits) and suitable for switching low voltage signals</i>
Valve Control Outputs	(2 stage on/off or digital control valves) Isolated Solid State Relays (SSRs) rated 1 A @ 240 Vac <i>Note: SSRs are not suitable for switching dc voltages</i> <ul style="list-style-type: none"> <li>- Contact voltage: Min. 24 Vac / Max. 265 Vac</li> <li>- Optical Isolation: 2500 Vrms</li> <li>- Current range: 0.02 to 1 A</li> <li>- Max. surge current: 20 A</li> <li>- Max. off-state leakage current: 20 mA</li> </ul>
Additive Outputs Conventional Piston Injector	SSR rated at 1A @ 240 Vac (one per loading arm)
Pump Demand Outputs	Electromechanical relay rated at 1A @ 240 Vac or 30 Vdc (one per loading arm)
Alarm Outputs	1 x Electromechanical relay rated at 1A @ 240 Vac or 30 Vdc
Power Outputs	12 Vdc for flow meters (250 mA max); 8-30 Vdc for temp. sensors (100 mA max)
Approvals	
The 1010Ax-CJ & CB complies with OIML R117-1 and MID international metrology approvals.	<p>Hazardous area approvals for the enclosure include:</p> <ul style="list-style-type: none"> <li>- European Approval ATEX II2G EEx d IIB T6</li> <li>- USA &amp; Canadian CSAus/c for Class 1, Groups C&amp;D, T4</li> <li>- IECEx Ex d IIB T6</li> </ul> <p>Approvals for the Touch Keys, Reader and barrier include:</p> <ul style="list-style-type: none"> <li>- European Approval ATEX II2G EEx d [ja] IIB T6</li> <li>- USA &amp; Canadian CSAus/c for Class 1, Groups C&amp;D, T4</li> <li>- IECEx Ex d [ja] IIB T6</li> </ul>
EMC standard	
EN50081-1 & EN50081-2, EN50082-1 & EN50082-2, EN61000-6-4 (2001) <i>Important: Specifications are subject to change without notice.</i>	

## Identification Code Model 1010CJ

### Pos 1, 2, 3, 4, 5 Model

1 0 1 0 A Graphical Display, Explosion Proof Enclosure

### Pos 6 Number of Loading Arms

- 1 One Arm Loading System
- 2 Two Arm Loading System
- 4 Four Arm Loading System

### Pos 7 Separator

-

### Pos 8, 9 Application Pack

C J For Description See Application Pack

### Pos 10 Separator

-

### Pos 11 Authorisation

- 0 None or PIN (User selectable)
- 2 Touch Key ATEX
- 3 Interface to Prox Card Reader

### Pos 12 Glands, Approval & Heater

- A SAA Approved with Metric Glands
- C CSA Approved with NPT Glands
- D CSA Approved, NPT Glands and Heater
- M ATEX Approved, Metric Glands
- N ATEX Approved, Metric Glands and Heater

### Pos 13 Power Supply

- 1 110 Vac
- 2 240 Vac
- 3 DC

### Pos 14 Display Type

N Dot Matrix

### Pos 15 Weight & Measure Approval

- 0 None
- 3 NMI approved acc. to MID & OIML R117-1

1 0 1 0 A 4 - C J - 0 M 2 N 0

1 0 1 0 A - C J - N 0

Typical Identification Code

Your Identification Code

## Accessories

Part Number	Description
TK1010-BLACK-ASSY	Touch key ROM on Black holder
TK1010-BLUE	Touch key ROM on Blue holder
TK1010-GREEN	Touch key ROM on Green holder
TK1010-YELLOW	Touch key ROM on Yellow holder
TK1010-RED	Touch key ROM on Red holder

Note: CF = Consult Factory

## Identification Code Model 1010CB

### Pos 1, 2, 3, 4, 5 Model

1 0 1 0 A Graphical Display, Explosion Proof Enclosure

### Pos 6 Number of Loading Arms

- A One Arm Load Computer controlling 6 Slave Additive Injectors (Total)
- B One Arm Ratio Blending Load Computer controlling 4 Slave Additive Injectors (Total)
- C One Arm Side-Stream Blending Load Computer controlling 4 Slave Additive Injectors (Total)
- D Two Arm Load Computer controlling 4 Slave Additive Injectors (Total)
- E Two Arm Load Computer, One Straight Product, One Ratio Blending, controlling 2 Slave Additive Injectors (Total)
- F Two Arm Load Computer, One Straight Product, One Side-Stream Blending, controlling 2 Slave Additive Injectors (Total)
- G Two Arm Load Computer Each with Ratio Blending (Only Smart Additive - MP3000, MP6)
- H Two Arm Load Computer Each with Side-Stream Blending (Only Smart Additive - MP3000, MP6)
- J Four Arm Load Computer, All Straight Product Loading (Only Smart Additive - MP3000, MP6)

### Pos 7 Separator

-

### Pos 8, 9 Application Pack

C B Application Pack

### Pos 10 Separator

-

### Pos 11 Authorisation

- 0 None/PIN (User selectable)
- 1 NextWatch Card Reader Interface
- 2 Touch Key
- 3 RFID Interface

### Pos 12 Glands, Approval & Heater

- A SAA Approved with Metric Gland
- C CSA Approved with NPT Glands
- D CSA Approved, NPT Glands and Heater
- M ATEX Approved, Metric Glands
- N ATEX Approved, Metric Glands and Heater

### Pos 13 Power Supply

- 1 110 Vac
- 2 240 Vac
- 3 DC

### Pos 14 Display Type

N Dot Matrix

### Pos 15 Weight & Measure Approval

- 0 None
- 3 MID (OIML R117-1)
- 4 US NTEP (Not Available Yet)

1 0 1 0 A A - C B - 1 M 2 N 1  
 1 0 1 0 A - C B - N 1

Typical Identification Code

Your Identification Code

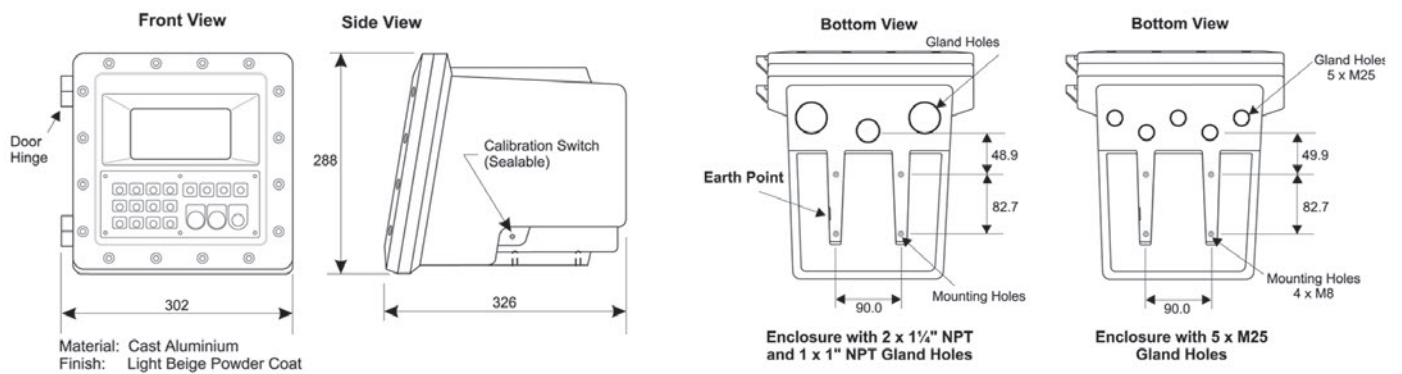
## Accessories

Part Number	Description
TK1010-BLACK-ASSY	Touch key ROM on Black holder
TK1010-BLUE	Touch key ROM on Blue holder
TK1010-GREEN	Touch key ROM on Green holder
TK1010-YELLOW	Touch key ROM on Yellow holder

Note: CF = Consult Factory

## Dimensional Drawing

### Explosion Proof Enclosure



### For More Information

To learn more about Honeywell Enraf's Load Computers, visit [www.honeywellenraf.com](http://www.honeywellenraf.com) or contact your Honeywell Enraf account manager.

#### Americas

Honeywell Enraf Americas, Inc.  
2000 Northfield Ct.  
Roswell, GA 30076  
USA  
Phone: +1 770 475 1900  
Email: [enraf-us@honeywell.com](mailto:enraf-us@honeywell.com)

#### Europe, Middle East and Africa

Honeywell Enraf  
Delftechpark 39  
2628 XJ Delft  
The Netherlands  
Phone: +31 (0)15 2701 100  
Email: [enraf-nl@honeywell.com](mailto:enraf-nl@honeywell.com)

#### Asia Pacific

Honeywell Pte Ltd.  
17 Changi Business Park Central 1  
Singapore 486073  
Phone: +65 6355 2828  
Email: [enraf-sg@honeywell.com](mailto:enraf-sg@honeywell.com)

**Honeywell Enraf**

Your Terminal Operations Partner