

**Product Data Sheet**

IP2031, Rev BA  
March 2012

**Mobrey MCU900 Series**

# Mobrey MCU900 Series Universal Control Unit

- *Intrinsically Safe power supply to transmitter*
- *4–20mA HART input*
- *Isolated 4–20mA output*
- *Five control relays*
- *Multi-function back lit display*
- *Wall or panel mount*
- *Pre-programmed linearization: volume and open channel flow*
- *Configurable by using the integral keypad*



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www.mobrey.com



# Mobrey MCU900 Series

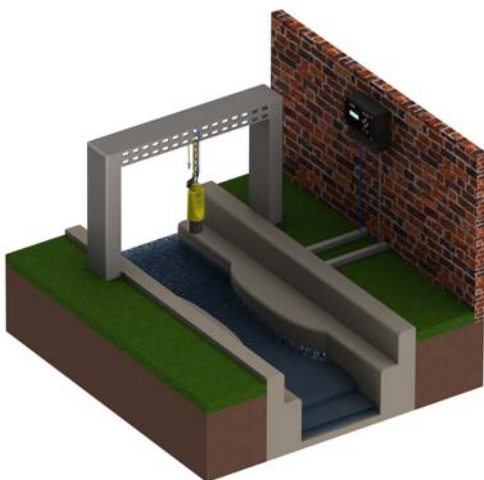
## Reliable Performance...In Challenging Applications



Wall Mount, IP65 Model Of The Mobrey MCU900 Series Controller Unit



Panel Mount Model Of The Mobrey MCU900 Series Controller Unit



Flow Measurement with a Mobrey MCU900 Series Control Unit and Mobrey MSP900FH Flow Transmitter

### OVERVIEW OF THE MCU900 SERIES

The MCU900 Series of wall and panel mounting control units provide comprehensive control functionality for any 4–20 mA or HART compatible transmitter. A back-lit display gives clear visual indication of the measured value and status of all inputs and outputs.

### FEATURES AND BENEFITS

- Tough weatherproof wall mount enclosure for internal and external mounting
- Accepts any 4–20 mA or HART compatible input
- Five voltage-free SPDT relays for alarm and control duties
- Supports two voltage-free contact closure inputs
- 4–20 mA 12-bit isolated current output proportional to calculated value
- Bright local display of measured value and input/output status
- Pre-programmed tank shapes, flow algorithms, and control control routines simplify configuration. A 20-point strapping table facility is provided for non-standard applications
- Real-time clock allows energy saving routines and pump efficiency calculations

### Intrinsically Safe Power Supply To transmitter

The MCU900 Series is mounted in a non-hazardous area, and provides a protected (intrinsically safe) 24 volts direct current supply to a transmitter in a hazardous area.

### Ideal For Programming And Control Of Rosemount Transmitters

It is ideal for programming and control of Mobrey MSP Series level and flow transmitters.

Other HART transmitters can be connected. The MCU900 Series recognizes the transmitters as an “unknown instruments” but allows access to programming of Universal and Common Practice HART commands.

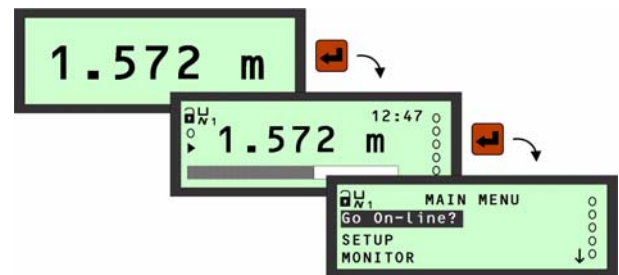
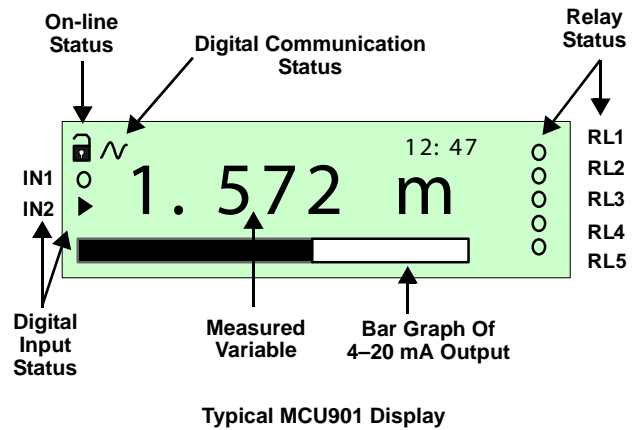
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# Mobrey MCU900 Series

## SPECIAL FEATURES

- Configured and interrogated using an integral six-button keypad
- Easy to navigate menu structure
- Wizard assisted programming, with password protection to prevent unauthorized access  
Many popular configurations are “Wizard assisted”, enabling fast and accurate programming. Typical applications include level, volume, distance measurement, and open channel flow measurement
- The HART digital or 4–20 mA analog signal from the transmitter may be offset, dampened, scaled, and linearized. A range of pre-programmed linearization algorithms are user-selectable
- The 4–20 mA output signal may be scaled to re-transmit all or just part of the transmitter’s input signal or calculated value
- Five relays are fully field programmable to perform a variety of control, fault indication, and alarm duties
- Two digital inputs can be individually set-up to perform various control actions (e.g. raise an alarm) whenever activated



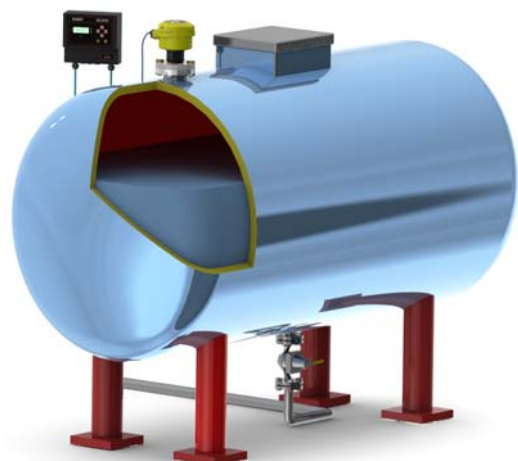
## CHOOSING THE RIGHT MODEL

Each model of the MCU900 Series has been designed for a specific purpose, as shown below:

Table 1. Choosing The Right Control Unit

Controller Unit Purpose	Model	Ordering Information
Pump Control, Contents, or Flow	MCU901	Page 4
Differential Level or Summated Flow	MCU902	Page 4
Process Value (PV) Data Logging	MCULOG	Page 5
Open Channel Flow Data Logging	MCU90F	Page 5

- The standard MCU901, MCU90F, and MCULOG Control Units accept input from one transmitter
- The Mobrey MCU901 Differential Measurement Control Unit accepts input from two transmitters and performs sum or differential calculations, providing a single current output proportional to the answer
- The Data Logging Control Units provides on-board logging of the process/primary value (PV) and totalized open channel flow



Level or Volume Measurement with a Mobrey MCU900 Series Control Unit and Mobrey MSP900RH Level Transmitter

# Mobrey MCU900 Series

## Mobrey MCU901 and MCU902 Control Units



(Wall Mount, IP65)



(Panel Mount)

Capabilities include:

- Wall mount or Panel mount versions
- Powers any HART or two-wire 4–20 mA transmitter
- Dual HART inputs for Differential level (MCU902 only)
- Backlit LCD three line display
- Simple push button programming
- Wizard programming for Level, Tank volume, and Open Channel flow
- Five SPDT relays, and a 4–20 mA output
- ATEX Intrinsically Safe (associated equipment) approved

### Additional Information

Specifications: page 6  
 Certifications: page 8  
 Dimensions: page 9

Table 2. MCU901 and MCU902 Ordering Information

Model	Product Description
MCU901	Standard Control Unit, 110 to 230 Vac (50/60 Hz)
MCU902	Differential Control Unit
<b>Enclosure / Mounting</b>	
<b>Standard</b>	
WX-	Wall mounting, IP65
PX-	Panel mounting, IP20
<b>Product Certificates</b>	
A	ATEX Intrinsically Safe
<b>OPTIONS</b>	
<b>Power Supply</b>	
24	24 Vdc
<b>Typical Model Numbers: MCU901WX-A and MCU902WX-A</b>	

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**Mobrey MCU900 Series**

**Mobrey MCU90F and MCULOG Control Units**



(Wall Mount, IP65)



(Panel Mount)

Capabilities include:

- Powers any HART or two-wire 4–20 mA transmitter
- Backlit LCD three line display
- Simple push button programming
- Wizard programming for Open Channel flow
- Cumulative and Daily totals, five SPDT relays, and a 4-20mA output
- Integral data logger 7000 flow events (MCU90F only)
- ATEX Intrinsically Safe (associated equipment) approved

**Additional Information**

Specifications:                      page 6  
 Certifications:                      page 8  
 Dimensions:                          page 9

Table 3. MCU90F and MCULOG Ordering Information

Model	Product Description
MCU90F	Open Channel Flow Logging Control Unit
MCULOG	Logging Control Unit
<b>Enclosure / Mounting</b>	
<b>Standard</b>	
WX-	Wall mounting, IP65
PX-	Panel mounting, IP20
<b>Product Certificates</b>	
A	ATEX Intrinsically Safe
<b>OPTIONS</b>	
<b>Power Supply</b>	
24	24 Vdc
<b>Typical Model Numbers: MCU90FWX-A and MCU90FWX-A</b>	

## Mobrey MCU900 Series

## Specification

General	
Product	Mobrey MCU900 Series Universal Control Unit: MCU901 Standard Control Unit MCU902 Differential Control Unit MCU90F Flow Logging Control Unit MCULOG Logging Control Unit
Mounting Styles	Wall mount or panel mount
Power Options	AC Mains or DC
Display	
Type	Dot matrix LCD, 32 x 122 pixels, back lit
Location	Integrated into enclosure
Indicators	Red LED for health status
Electrical	
AC Mains Power Supply Input	115 or 230 Vac $\pm 10\%$ (switch selectable) Power consumption: 10 VA nominal, 18 VA maximum Fuse: 200 mA(T), 5 x 20 mm, 250 V
DC Power Supply Input	15 to 30 Vdc, 30 Vdc maximum Power consumption: 9 W maximum
Current Input	4–20mA (Earth referenced in control unit) or HART digital communications (Rev. 5) (Supplies 23 volts from 400 Ohm source resistance)
Trigger Inputs	2 voltage-free contact closures
Current Output	Signal range (nominal): 4–20 mA Output range (linear): 3.8 to 20.5 mA (Alarm current of 3.6 mA, 21 mA, or 22.5 mA user-selectable) or 3.9 to 20.8 mA (Alarm current of 3.75 mA, or 21.75mA user-selectable) Load: Rmax is 1 K Ohm Resolution: 12-bit Regulation: < 0.1% over load change from 0 to 600 Ohms Isolation: Isolated from other terminals to 500 Vdc Update rate (software): 5 times per second
Relays	5 x SPDT, 5 A at 240 Vac
Cable Entry	IP-rated wall mount enclosure: 5 positions pre-drilled, 2 glands and 3 blanking plugs supplied Panel enclosure: Direct wiring to terminal blocks at rear
Cable Connection	Wall mount enclosure: Cage clamp terminal blocks in separate terminal compartment Panel mount enclosure: 2-part cage clamp terminal blocks at rear
Mechanical	
Materials Of Construction (Wall Mount)	Polycarbonate enclosure and cover IP-rated wall mount: 304SST cover fixing screws Wall mount: Polyester and Alloy 400 fastening UV resistant Polycarbonate membrane keypad Nylon cable glands and blanking plugs (IP-rated wall mount version only)
Materials Of Construction (Panel Mount)	Noryl PPO enclosure and cover Carbon Steel / Zinc plated fascia fixing screws UV resistant Noryl PPO membrane keypad Nylon + PBT terminal blocks with plated fittings
Dimensions	See Dimensional Drawings on pages 9 to 10
Weight	IP-rated wall mount: 1.4 kg (mains unit) or 1.0 kg (DC unit) Panel mount 1.2 kg (mains unit) or 0.8 kg (DC unit)

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Environment	
Ambient Temperature <sup>(1)</sup>	-40 to 55 °C (-40 to 131 °F)
Relative Humidity	Wall mount: 100% Panel mount: 90% non-condensing
Electrical Safety	EN61010-1
Ingress Protection	IP-rated wall mount: IP65 indoor/outdoor. Panel mount: IP40 indoor mount (or IP65 if with optional hood)
Vibration	Control Room: 0.1 to 9 Hz 1.5 mm displacement peak amplitude / 9 to 200 Hz 0.5 g
Installation Category	III : Supply voltage < 127Vac (IEC60664) II : Supply voltage < 254Vac (IEC60664)
Pollution Degree	2 (IEC60664)
Maximum Altitude	2000 m
Electromagnetic Compatibility	Emissions and Immunity (for IP-rated wall mount and panel mount): EN61326-1:2006
Certifications	CE-mark and ATEX

(1) See Product Certifications on page 8 for approval temperatures ranges.

# Mobrey MCU900 Series

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## Product Certifications

### European Directive Information

The EC declaration of conformity for all applicable European directives for this product may be obtained by contacting your local sales office.

#### **ATEX Directive (94/9/EC)**

Complies with the ATEX Directive

#### **Low Voltage Directive (2006/95/EC)**

EN61010 Part 1: 2001

#### **Pressure Equipment Directive (PED) (97/23/EC)**

The Mobrey MCU900 Series is outside the scope of PED Directive

#### **Electro Magnetic Compatibility (EMC) Directive**

EN61326-1: 2006

#### **CE-mark**

The Mobrey MCU900 Series complies with EMC, ATEX, and LVD directives

#### **Restriction of Hazardous Substances (ROHS)**

The Mobrey MCU900 Series is exempt

### Hazardous Locations Certifications

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#### **NOTE:**

The MCU900 Series is mounted in a non-hazardous area, and provides a protected (intrinsically safe) 24 volts direct current supply to a transmitter in a hazardous area.

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#### **ATEX Intrinsically Safe Approval**

Certificate Numbers:

BAS00ATEX7064 (Wall Mount),

BAS01ATEX7225X (Panel Mount)

Intrinsically Safe for II(1) G D,

[Ex ia Ga] IIC, [Ex ia Da] IIIC

Ambient Temperature: -40 °C to +55 °C

U<sub>o</sub> = 27,3 V, I<sub>o</sub> = 96,9 mA, P<sub>o</sub> = 0,66 W,

Li = 0,22 mH, Ci = 0,6 nF

#### **Special conditions for safe use**

##### **(Certificate BAS01ATEX7225X):**

1. Terminal 30 must be earthed in the safe area to a high integrity earth.



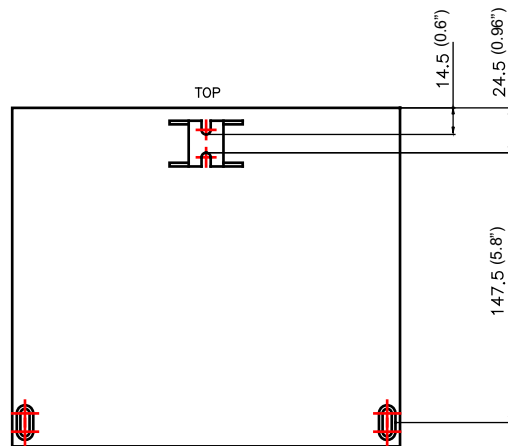
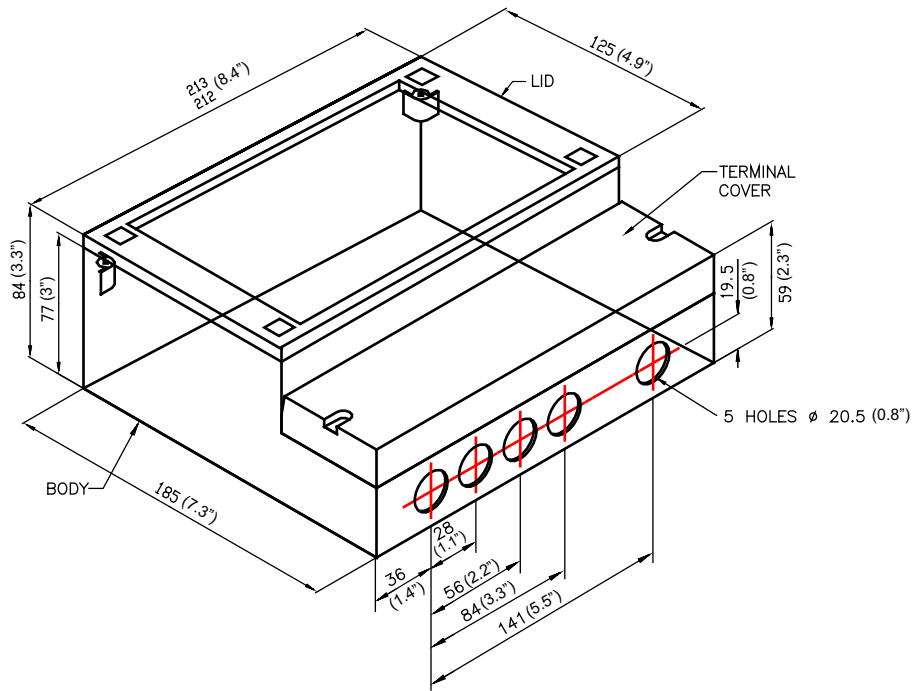
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**Mobrey MCU900 Series**

**Dimensional Drawings**

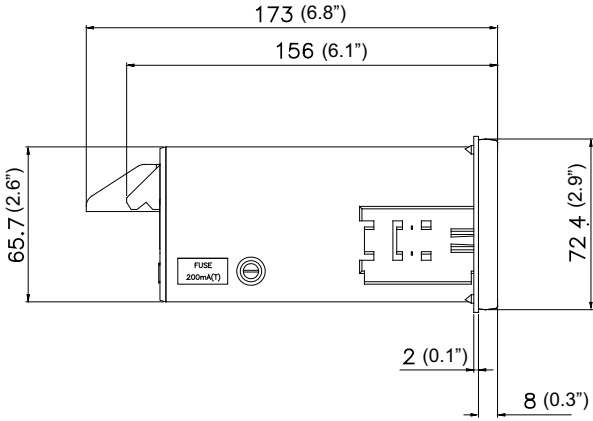
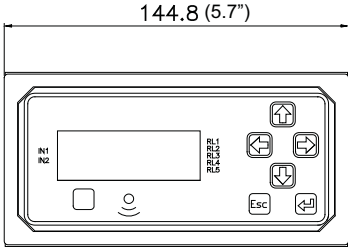
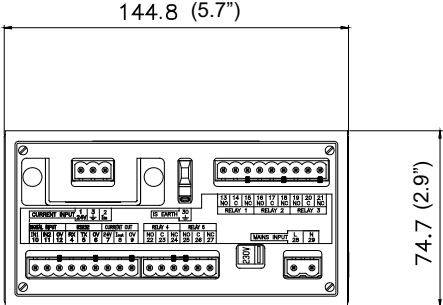
**Dimensions for IP-rated Wall Mount Box**



# Mobrey MCU900 Series

## Dimensions for Panel Mount

Panel mounting details:  
Panel cut-out: 138 mm x 68 mm  
Allow 165 mm clearance behind panel



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# Mobrey MCU900 Series

## Mobrey Level Solutions

Emerson provides a wide range of Mobrey products for level measurement applications.

### POINT LEVEL DETECTION

#### Vibrating Fork Liquid Level Switches

For high and low alarms, overflow protection, pump control, including wide pressure and temperature requirements, and hygienic applications. Flexible mounting. Immune to changing process conditions and suitable for most liquids.

- Mobrey Mini-Squing (Compact)
- Mobrey Squing 2 (Full-featured)

#### Ultrasonic Gap Sensor Liquid Level Switches

For use in non-hazardous industrial processes to detect high or low liquid levels and liquid interface. Immune to changing density, and wide dielectric and pH variations. Suitable for use in most clean and non-aerated liquids, with options for sludges and slurries.

#### Float and Displacer Liquid Level Switches

Mobrey electromechanical float and displacer level switches are ideal for alarm and pump control duties, especially in critical applications or hazardous areas.

- Mobrey Horizontal Level Switches
- Mobrey Vertical Level Switches

Chambers are available for external mounting of these level switches on process vessels.

#### Dry Products Level Switches

For high and low level alarms. Including threaded mounting connections, extended lengths, high temperature capability, and multiple detection techniques. Suitable for a wide variety of powders, granules, and free flowing solids with wide variations in bulk densities.

- Mobrey VLS Series – Vibrating Rod Level Switch
- Mobrey PLS Series – Paddle Level Switch
- Mobrey CLS Series – Capacitance Level Switch

### CONTINUOUS MEASUREMENT

#### Ultrasonic Continuous Level Transmitters and Controllers

Top mounted, non-contacting for simple tank and open-air process level measurements. Unaffected by fluid properties such as density, viscosity, dirty coating, and corrosiveness. Intrinsically Safe versions are available for operating in hazardous areas.

- Mobrey MSP Series Ultrasonic Level and Flow Transmitters
- Mobrey MCU900 Series Universal Controllers

#### Ultrasonic Sludge Density Blanket Monitoring and Control

Ultrasonic in-line pipe or tank mounted sensors for sludge density measurement and control, and top mounted ultrasonic sensors for continuous measurement of sludge blanket level in Industrial and Municipal effluent treatment processes.

- Mobrey MSM400 – Sludge Density Monitor
- Mobrey MSL600 – Sludge Blanket Level Monitor

#### Displacer Continuous Level Measurement

Top mounted in a vessel or externally mounted in a vertical chamber. For use in hazardous areas.

- Mobrey MLT100 – Displacer Level Transmitter

#### Hydrostatic Continuous Level Transmitter

For level measurements in non-pressurized tanks where in-tank problems such as foaming, vapor layers, and temperature gradients prohibit the use of other instrumentation.

- Mobrey 9700 Series hydrostatic electronic level transmitters

### SPECIALIZED CONDUCTIVITY

#### Conductivity Water and Steam Interface Monitoring

Steam/water interface level gauges using specialized, high performance conductivity probes in external columns and manifolds, ideal for steam plants where reliable and redundant indication of boiler water level and turbine protection is critical.

- Hydratect 2462 – Water/Steam detection Systems
- Hydrastep 2468 – Water/Steam Monitoring Systems

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