

# FUSION4 MULTISTREAM CONTROLLER ADDITIVE

Unmatched Control for Additive Injection



Honeywell

# GLOBAL TERMINAL EXPERIENCE LOCALLY APPLIED

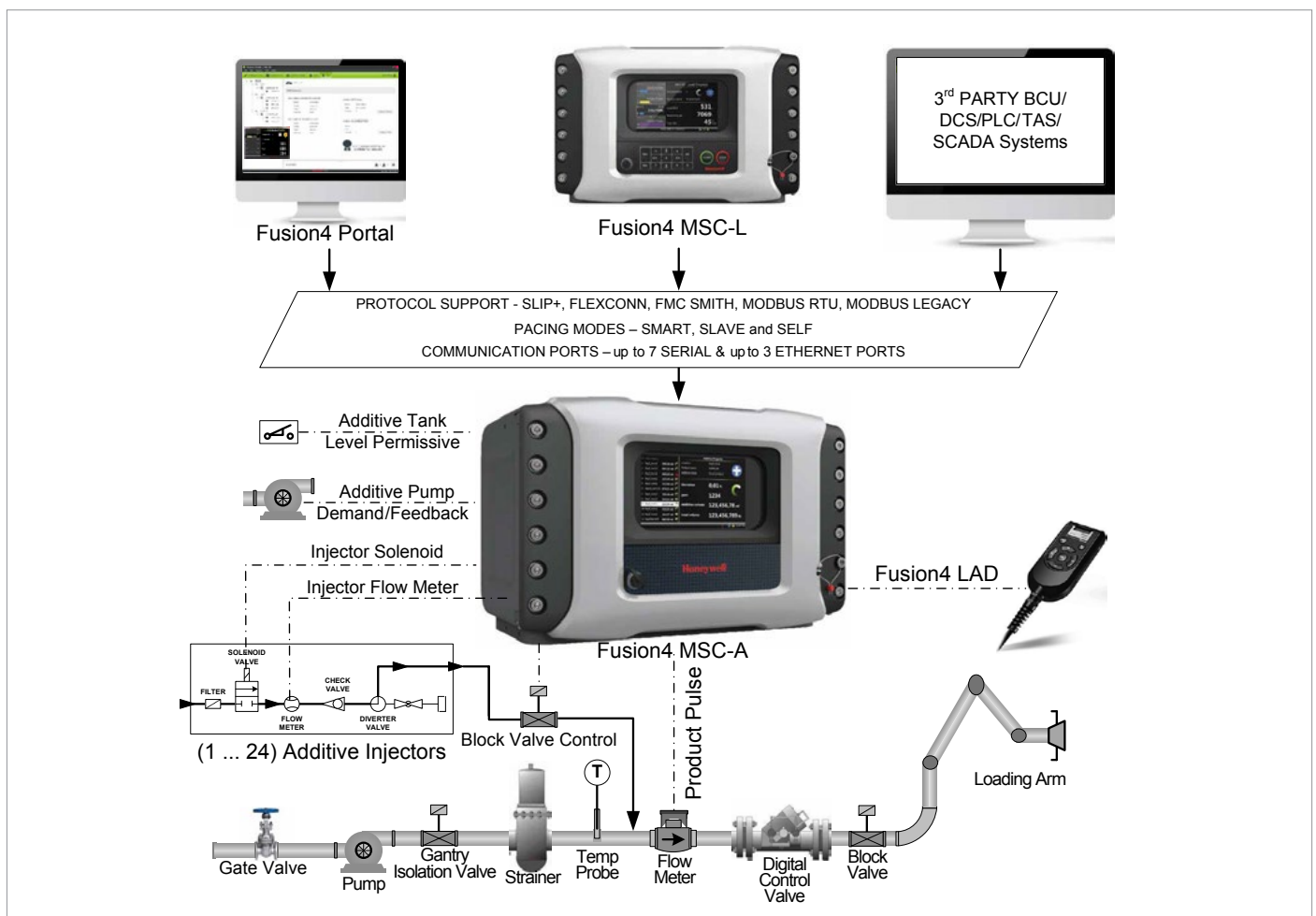
Additive injection is a critical part of the petroleum terminal business requiring high levels of safety, precise measurements, complete control and accurate recording of added volumes. Fusion4 MSC-A controls up to 24 Additive Streams simultaneously communicating with up to 6 preset controller devices or SCADA HMI/TAS Control Systems for injection management.

With 45 years of additive injection solution experience, including additive injectors installed around the world, Honeywell Enraf is an industry leader offering the most advanced additive control portfolio on the market.

The Fusion4 Multistream Controller-Additive (MSC-A) is an intelligent,

hazardous area additive injection controller utilizing state-of-the-art technology for high-accuracy additive injection applications in the global oil storage and distribution industry. This advanced controller features the highest I/O count available, which enables exceptional functionality and unrivalled additive stream control.

The Fusion4 MSC-A manages injections by automatically correcting the additive injected volume across injection cycles. It continuously monitors additive volumes in up to 24 streams and ensures on spec additive delivery in every transaction.



Pictorial representation showing a basic setup of the additive controller. Additional interfaces might be needed, depending on site requirements.

# TAKE CONTROL OF YOUR ADDITIVE OPERATIONS

## PRECISION BY DESIGN

Precision is about smart compensation to overcome momentary line pressure changes. MSC-A monitors more critical operational parameters than any other device, meaning you know as soon as the precision of your additive operation is compromised.

## CONNECTIVITY IS KEY

MSC-A comes with a wide range of inbuilt protocol libraries and communication network capabilities. Supporting up to 7 Serial and 3 Ethernet ports, it integrates seamlessly with industry-standard systems like TAS, DCS, PLC, SCADA HMI or 3rd party batch controllers to enable connectivity and protect existing investments.

## FLEXIBLE I/O AND INTERFACING

The Fusion4 MSC-A allows users to assign functions to any input or output with configurable I/O. Flexible interfacing is possible via the LAD, which can copy and paste a configuration file to and from any other MSC device. The LAD also facilitates two-way data communications with the Fusion4 MSC-A, allowing rapid, secure transfer of transaction data, calibration records and firmware upgrades without opening the device enclosure.

## SMART CALIBRATION AND DIAGNOSTICS

The Fusion4 MSC-A also includes a Calibration Wizard designed to automatically capture every calibration record (including time stamps, calibration volumes, K-factor corrections and even meter serial numbers) for greater traceability and security.

Multiple diagnostics dashboards for complete hardware and communications monitoring from a single screen improve reliability and reduce maintenance time.

## EFFICIENT CONFIGURATION AND UPDATES

Configure the Fusion4 MSC-A from new in less than 60 seconds with the smart, handheld Local Access Device (LAD) for a quicker, more efficient start-up, and use the LAD again to update firmware live in the field, boosting productivity.

There's no need to power down, open, and exchange EPROMs in the Fusion4 MSC-A.

## THE INFORMATION AGE

If precise control is at the heart of the Fusion4 MSC-A, then information is in its DNA.

At every level, the MSC-A collates, displays, archives, and distributes an unparalleled level of system information, equipping the user to make the right operational and business decisions. Control optimization, transaction traceability, calibration security, and enhanced diagnostic tracking are all facilitated by this advanced level of data, leaving the user without a shred of doubt about the effectiveness of their additive operation.

## MULTIPLE LANGUAGE SUPPORT

English (US), English (UK), Chinese, Japanese, French, Spanish, Portuguese, Italian, Dutch, German and Polish language choices are available for loading progress screens.

## FULL SYSTEM CONTROL

With modular expansion pack upgradability, the MSC-A has the I/O capability to manage all peripheral system elements, such as pump starting, tank level monitoring, block valve control, and system pressure and temperature monitoring.

## A BETTER SOLUTION

### Multiple Masters:

Communicates simultaneously with up to 6 master devices, such as load computers, facilitating whole bay injection management.

### Rapid Start-Up:

- Enabled by the Calibration Wizard and 60-second configuration.
- Configurable, expandable I/O and Scalable functionality via MSC-A expansion packs.

### Huge Transaction Archives:

Stores up to 240,000 transaction records.

### Advanced Alarm Handling:

Monitor injection control parameters and alarm page on large 8" color display.

### Real-time Diagnostics:

Multiple diagnostics dashboards (Stream, I/O type, System Health, Ethernet and Serial Comms) and switch count register for every single I/O.

# SUPERIOR APPLICATION FLEXIBILITY

Fusion4 MSC-A offers comprehensive interfaces for the additive injection application. The capabilities detailed here are available for each of the 24 supported additive streams.

APPLICATION TYPE	BASIC	STANDARD	ADVANCED
<b>Functionalities</b>	Requires basic I/O and functionalities	Requires more I/O and minimal functionalities	Requires complete I/O and functionalities
<b>Additive flow pulses</b> - hard wired	✓	✓	✓
<b>Solenoid control</b> - hard wired	✓	✓	✓
<b>Additive volume output</b> - hard wired, comms	✓	✓	✓
<b>Permissive enable</b> - hard wired, comms, Fusion4 LAD or IR	✓	✓	✓
<b>Alarm reset</b> - hard wired, comms, Fusion4 LAD or IR	✓	✓	✓
<b>Alarm indication</b> - hard wired, comms	✓	✓	✓
<b>Alarm shutdown</b> - hard wired, comms	✓	✓	✓
<b>Pump start</b> - hard wired		✓	✓
<b>Pump feedback</b> - hard wired		✓	✓
<b>Start clean arm</b> - hard wired, comms		✓	✓
<b>Inject-now signal</b> - hard wired, comms		✓	✓
<b>Injection recipe (b/w batches)</b> - comms, Fusion4 LAD or IR		✓	✓
<b>Self-paced</b> - configurable timer			✓
<b>Injection feedback</b> - hard wired			✓
<b>Analog additive volume output</b> - hard wired			✓
<b>External solenoid or Block valve control</b> - hard wired			✓
<b>System interlock</b> - hard wired, comms			✓
<b>Tank empty</b> - hard wired			✓
<b>Tank low level</b> - hard wired			✓

# A SMARTER USER INTERFACE

Fusion4 MSC-A offers a unique user experience built for the way people work. Comparable to smart phone and tablet user interface screens, the unit's self-explanatory graphical icons ensure easy access to all operations and functions.

M - Main Menu		Main Menu	
1	BAY1 ARM1	37.33 ml	■
2	BAY2 ARM2	41.33 ml	■
3	BAY3 ARM3	38.67 ml	■
4	BAY4 ARM4	40.00 ml	■
5	BAY5 ARM5	40.00 ml	■
6	BAY6 ARM6	38.67 ml	■
7	BAY7 ARM7	40.00 ml	■
8	BAY8 ARM8	40.00 ml	■
9	BAY9 ARM9	52.00 ml	■
10	BAY10 ARM1	38.67 ml	■
11	BAY11 ARM1	37.33 ml	■
12	BAY12 ARM1	41.33 ml	■

LAD Functions 15:08:26

M - Main Menu		Laatste Transactie	
1	BAY1 ARM1	6.40 ml	■
2	BAY2 ARM2	8.80 ml	■
3	BAY3 ARM3	10.33 ml	■
4	BAY4 ARM4	10.60 ml	■
5	BAY5 ARM5	10.73 ml	■
6	BAY6 ARM6	10.33 ml	■
7	BAY7 ARM7	10.93 ml	■
8	BAY8 ARM8	10.33 ml	■
9	BAY9 ARM9	10.27 ml	■
10	BAY10 ARM1	10.87 ml	■
11	BAY11 ARM1	8.30 ml	■
12	BAY12 ARM1	10.37 ml	■

Laatste Transactie		
Locatie		B20
Product naam		
ppm	92	
Additief volume	10.27 ml	
Laad volume	111.10 L	
Starttijd	10-01-13 17:26:24	
Eindtijd	10-01-13 17:26:54	
Status	Alarms	
<b>Dagtotalen</b>		
Aantal trans.	0	
Totaal volume	0 L	

10:28:33

## FEATURES & BENEFITS

- The events log stores 2000 entries, recording key events on each device, such as sealing or operator logins, to enhance security
- The last 1000 calibration records are stored for robust auditing of load arm proving operations
- Minimize proving downtime using the Calibration Wizard for automated proving process and record capture
- Monitor the diagnostics dashboard for real-time operational overview of all device I/O
- Importing device configurations permits rapid device start-ups in under a minute, in the field via LAD or remotely via the Fusion4 Portal
- Modular I/O allow plugin upgrades in comprehensive, economic steps
- On-device configurable I/O mean device functionality can be reassigned at will to accommodate new system setups
- Device firmware upgradable without device opening or power down
- SMART additive injection volume corrections during a transaction ensure absolute on-spec additive delivery

## PROGRAMMABLE SETUP PARAMETERS

### STREAM CONFIGURATION

Identification	BayName, ArmName, ProductName, Product Symbol, Haz Mat. Classification
Stream address	000-999 (Default 123)

### STREAM I/O BINDING

Number of streams	Dependent on the Additive Mode and Expansion Pack License - 1 to 24 Injectors Streams
Inputs	Pacing source, additive stream meter, permissive, system interlock, alarm reset, slow flow signal, pump feedback, tank low level switch, tank empty switch, additive temperature, ext. solenoid control
Outputs	Alarm indication, alarm shutdown, block valve control, injection feedback, pump start, factored pulse out, solenoid control

### ADDITIVE CONTROLS

Additive name	Text string of maximum 12 characters
Additive mode	SMART (COMM,DI,AI & Pulse), SLAVE and SELF
Injection point	Upstream, Down Stream
Permissive condition	OR (One of the System Interlock), AND (both of the System Interlock)
Factored pulse	1 Pulse/Unit to 1000 Pulses/Unit
Injection volume unit	Milliliter (default),Cubic centimeter
Volume per inj. Cycle unit	Liter; Cubic Meter; Cubic Centimeter; Cubic Decimeter; US Gallons; UK Gallons; Barrel
Injection offset	0 % ... 100 %
Self-pace injection period	1 s ... 32 s
Feedback mode	None (default), end-sensor switch, inverted end-sensor, mid-stroke switch, piston switch, inverted piston switch, post injection, double pulse, last 25% , ext. piston emulation, inv. ext. piston emulation
Feedback pulse duration	0 ms ... 1000 ms (default = 500 ms)
Piston control emulation	True or False
Pump run timeout	1 min ... 255 mins (default = 10 min)
Calibration	Manual and WIZARD-based

### COMMUNICATION

Protocol	SLIP+, FLEXCONN, FMC SMITH, MODBUS RTU, MODBUS LEGACY
Communication mode	Ethernet (Up to 3 ports)/RS485 (Up to 7 ports)

### ALARM, FAULTS & ALARM ACTIONS

Alarm actions	Disable, Display, Display - Shutdown
Alarms and faults	Leaking volume limit, leaking timeout period, flush volume deviation, no activity timeout, no additive timeout, pump feedback timeout, add. volume deviation, num. cycles for alarm, control fault, block valve fault, solenoid fault, pulse phase, factored pulse out, temperature sensor, tank low level, tank empty

## TECHNICAL SPECIFICATIONS

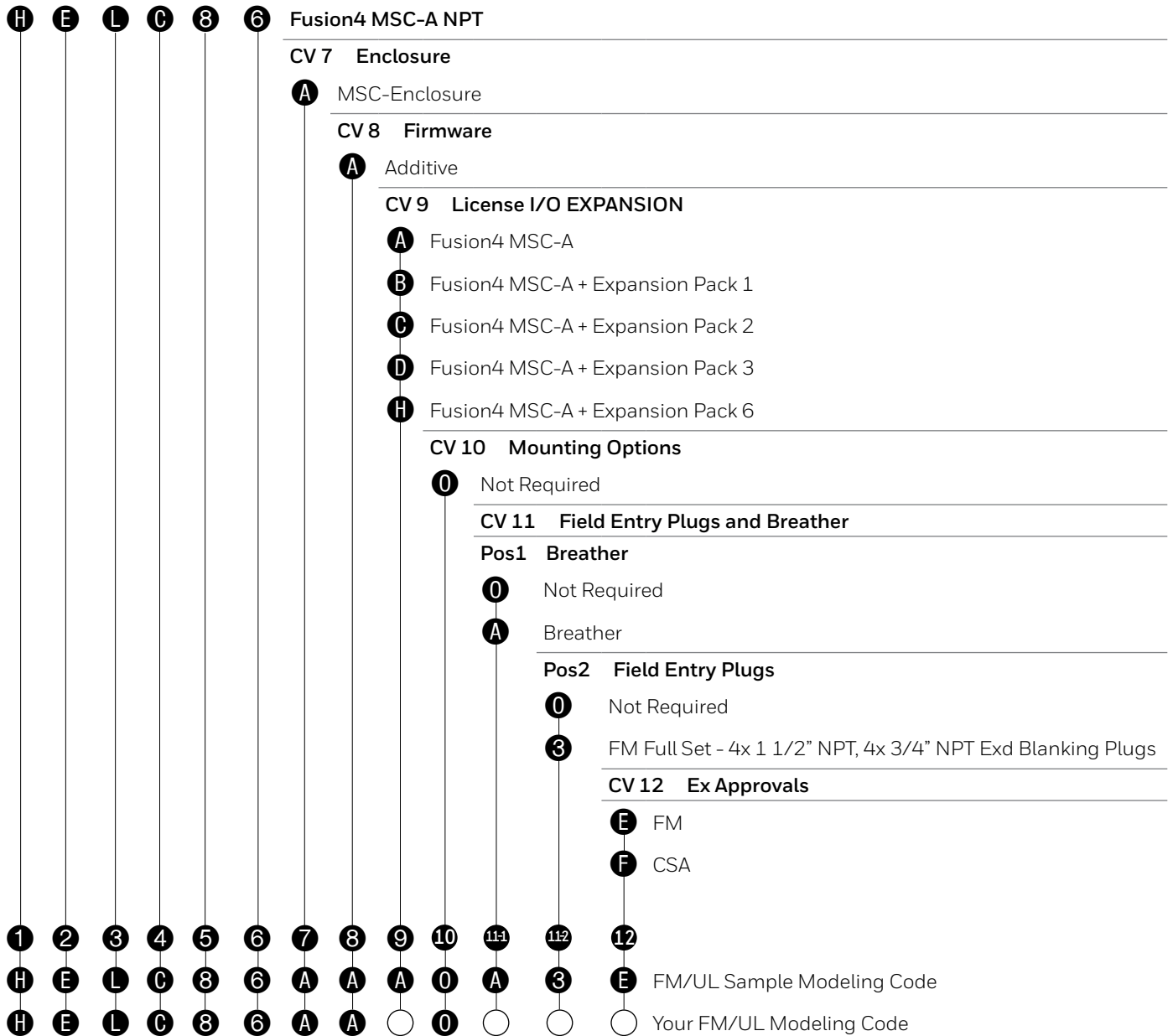
APPROVALS		MSC			
ATEX	II 2 G Ex db [ia] IIB T6 Gb				
IECEX	Ex db [ia] IIB T6 Gb				
FM	Class1 Div1 Group C&D T6				
CCOE	Ex d [ia] IIB T6 Gb				
INMETRO	Ex d [ia] IIB T6 Gb				
ENVIRONMENTAL		ATEX/IECEX		FM/CSA	
Operating temperature	-40 °C to +65 °C		-40 °F to +185 °F		
Storage temperature	-40 °C to +85 °C		-40 °F to +185 °F		
Protection class	IP66		NEMA 4X		
Humidity	5% - 95% Non-Condensing		5% - 95% Non-Condensing		
MATERIALS					
Enclosure	Aluminium, Anodized		Aluminum, Anodized		
CONNECTIONS					
Cable entries	6xM40, 6xM32, 2xM20		4x 1 1/2" NPT, 4x 3/4" NPT		
ELECTRICAL					
Voltage	88 to 264 Vac		88 to 264 Vac		
Flow meter inputs	24 x 10 kHz input		24 x 10 kHz input		
INTERFACING					
Serial protocols	FlexConn, Modbus RTU, Slip+, FMC Smith				
Ethernet protocols	FlexConn TCP/IP, Modbus TCP/IP				
Display	8" Super WVGA color TFT LCD screen				
Languages	English (US), English (UK), Chinese (Simplified), Japanese, French, Spanish, Portuguese, Italian, Dutch, German and Polish				
Handheld devices	Fusion4 LAD (local access device), Fusion4 IR Controller (Infra Red)				
WEIGHTS					
MSC-A	approx 53 kg		approx 115 lb		





# IDENTIFICATION CODE FOR FM/UL

## CV 1-6 MODEL KEY



## ACCESSORIES

Part Number	Description
323-1392002	Fusion4 LAD FM (Local Access Device)
323-1392003	Fusion4 LAD CSA (Local Access Device)
10-31052-F4U	Fusion4 IR Controller (UL)

## EXPANSION PACK DETAILS

LICENCES	A	B	C	D	H
EXPANSION PACK	FUSION4 MSC-A	FUSION4 MSC-A+ EXP1	FUSION4 MSC-A+ EXP2	FUSION4 MSC-A + EXP3	FUSION4 MSC-A + EXP6
<b>Typical Application</b>	<p>Cost Effective communication based control with no field I/O requirements. Includes multiple Serial Comms.</p> <ul style="list-style-type: none"> <li>- Up to 12 injectors - comms pacing</li> <li>- Up to 6 injectors - hi-freq pulse pacing</li> <li>- Up to 12 injectors - self pace mode</li> <li>- Each injector requires 1 SPI + 1 AC output</li> <li>- Each optional Blocking Solenoid requires an additional AC output</li> </ul>	<p>Mid level capability permitting 'inject now' pacing and basic field I/O requirements. Plus multiple Serial Comms and Ethernet</p> <ul style="list-style-type: none"> <li>- Up to 12 injectors - comms pacing</li> <li>- Up to 6 injectors - hi-freq pulse pacing</li> <li>- Up to 12 injectors - hardwired Inject Now pacing</li> <li>- Up to 12 injectors - self pace mode</li> <li>- Each injector requires 1 SPI + 1 AC output</li> <li>- Each optional Blocking Solenoid requires an additional AC output</li> </ul>	<p>Advanced capability permitting enhanced field I/O requirements including analogue and RTD. Plus multiple Serial Comms and Ethernet</p> <ul style="list-style-type: none"> <li>- Up to 12 injectors - comms pacing</li> <li>- Up to 6 injectors - hi-freq pulse pacing</li> <li>- Up to 12 injectors - hardwired Inject Now pacing</li> <li>- Up to 12 injectors - self pace mode</li> <li>- Up to 7 injectors analogue pacing</li> <li>- Each injector requires 1 SPI + 1 AC output</li> <li>- Each optional Blocking Solenoid requires an additional AC output</li> </ul>	<p>Superior capability permitting full hi-freq pacing and optimum field I/O functionality for total system control and redundancy</p> <ul style="list-style-type: none"> <li>- Up to 12 injectors - comms pacing</li> <li>- Up to 12 injectors - hi-freq pulse pacing</li> <li>- Up to 12 injectors - hardwired Inject Now pacing</li> <li>- Up to 12 injectors - self pace mode</li> <li>- Up to 12 injectors analogue pacing</li> <li>- Each injector requires 1 SPI + 1 AC output</li> <li>- Each optional Blocking Solenoid requires an additional AC output</li> </ul>	<p>Superior capability permitting full hi-freq pacing and optimum field I/O functionality for total system control and redundancy</p> <ul style="list-style-type: none"> <li>- Up to 24 injectors - comms pacing</li> <li>- Up to 12 injectors - hi-freq pulse pacing</li> <li>- Up to 12 injectors - hardwired DI-AC Inject Now</li> <li>- Up to 24 injectors - hardwired DI-DC Inject Now Pacing</li> <li>- Up to 24 injectors - self pace mode</li> <li>- Up to 12 injectors analogue pacing</li> <li>- Each injector requires 1 SPI + 1 AC output</li> <li>- Each optional Blocking Solenoid requires an additional AC Output(SSR) or(EMR)</li> </ul>
<b>HARDWARE INCLUDED (EXP ADDITIONS IN BLACK)</b>	<b>1 X BACKPLANE 1 1 X CAN-PSF 1 X CAN-ARM 1 X FUSE BOARD</b>	<b>1 X BACKPLANE 1 1 X CAN-PSF 1 X CAN-ARM 1 X FUSE BOARD 1 X CAN-IN-OUT</b>	<b>1 X BACKPLANE 1 1 X CAN-PSF 1 X CAN-ARM 1 X FUSE BOARD 2 X CAN-IN-OUT</b>	<b>1 X BACKPLANE 1 1 X BACKPLANE 2 1 X CAN-PSF 2 X CAN-ARM 2 X FUSE BOARD 2 X CAN-IN-OUT</b>	<b>1 X BACKPLANE 1 1 X BACKPLANE 2 2 X CAN-PSF 2 X CAN-ARM 2 X FUSE BOARD 4 X CAN-IN-OUT</b>
<b>Ethernet Ports</b>	0	1	1	3	3
<b>RS485 Comms Ports (2 wire)</b>	2	2	4	6	6
<b>RS485 Comms Ports (4 wire)</b>	1	1	1	1	1
<b>Single Pulse Inputs (SPI_hi freq))</b>	12	12	12	24	24
<b>AC Outputs (DO-SSR)</b>	12	16	20	32	40
<b>AC/DC Outputs (DO-EMR)</b>	0	10	20	20	40
<b>AC Inputs (DI-AC)</b>	0	3	6	6	12
<b>DC Inputs (DI-DC)</b>	0	15	30	30	60
<b>Analogue Outputs (AO)</b>	0	0	3	4	6
<b>Analogue Inputs (AI)</b>	0	0	7	14	14
<b>RTD's</b>	0	0	3	6	6
<b>Pulse Output (PO) (real time/ factored)</b>	2	2	2	4	4

# DISCOVER MORE PRODUCTS IN THE FUSION4 PORTFOLIO

## FUSION4 MULTIPAK

A complete off-the-shelf additive solution that integrates the industry standard Injector Block known as **MONOBLOCK III** or **MONOBLOCK II+**.

Fusion4 MultiPak is the perfect solution for a number of chemical dosing applications, including truck loading additives, rail loading additives and aviation fuel additive operations. The Fusion4 MultiPak station comprises pre-integrated additive injector panels with the Fusion4 MSC-A on a free-standing frame, providing rapid installation and reduced commissioning time.

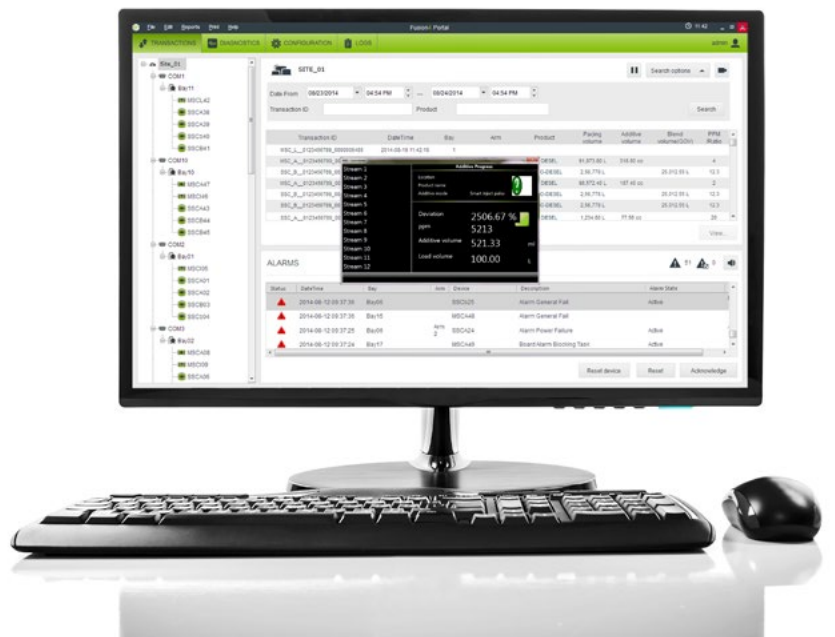
For more information visit <https://www.honeywellprocess.com/en-US/explore/products/terminal-operations/loading-automation/additive-injection-systems/Pages/fusion4-multipak.aspx>



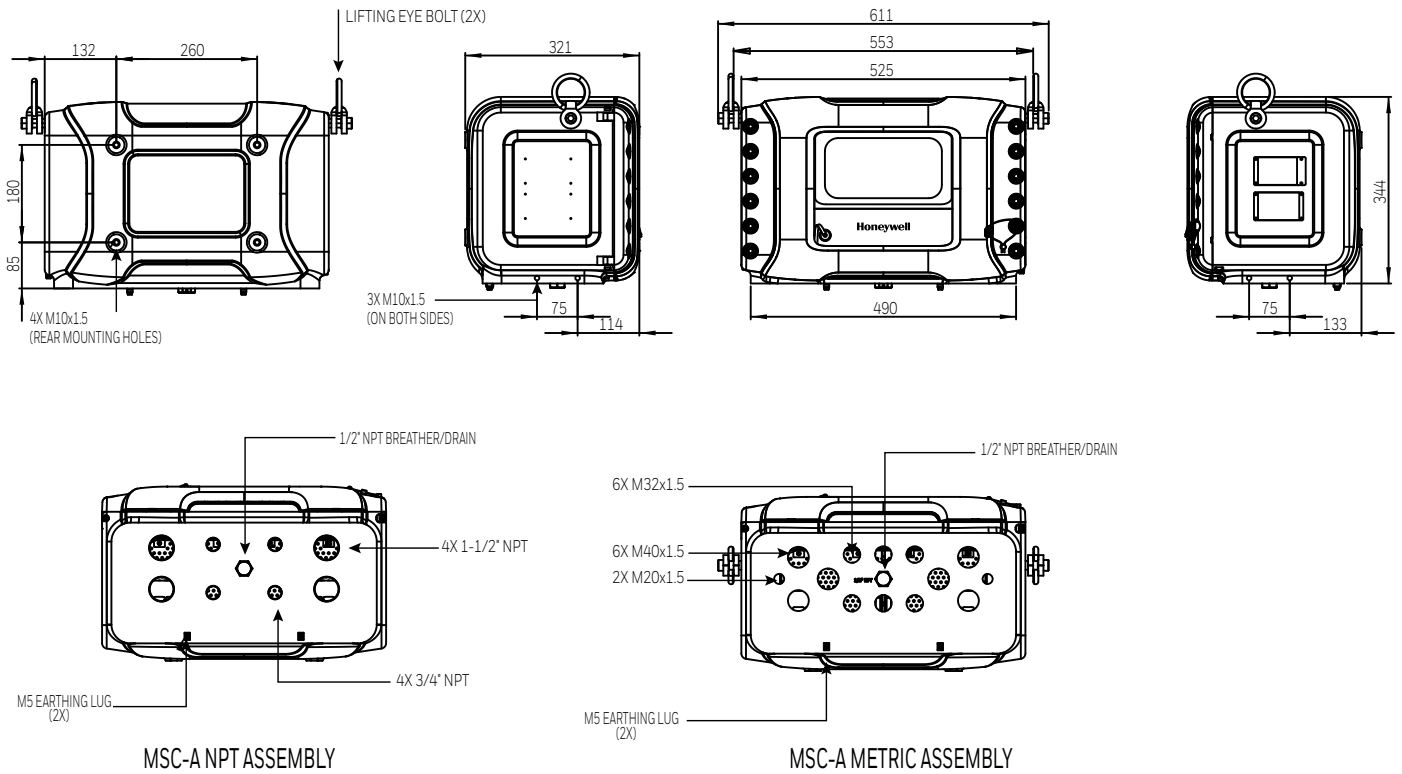
## FUSION4 PORTAL

Fusion4 Portal software brings together wide-ranging remote monitoring and supervisory capabilities for all Fusion4 devices on a single, integrated dashboard. With its modular structure, users can select the modules they need to print transaction (Bill of Lading), monitor real time audit trails for simpler reconciliation, and adjust parameter settings to get operations up and running quicker.

For more information visit <https://www.honeywellprocess.com/en-US/explore/products/terminal-operations/loading-automation/software-systems/Pages/fusion4-portal.aspx>



## DIMENSIONAL DRAWINGS



Dimensions are in mm

### For More Information

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

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THE  
FUTURE  
IS  
WHAT  
WE  
MAKE IT

**Honeywell**