



GUIDANT

Fusion4 Multistream Controller Additive

Unmatched control for additive injection



Main Menu		Additive Progress	
1 Bay1_Arm3	888,29 ml	Location	Bay1_Arm3
2 Bay1_Arm2	487,23 ml	Product name	SUPER_90
3 Bay2_Arm3	699,09 ml	Additive made	Smart product
4 Bay2_Arm2	373,43 ml	Deviation	0,01 %
5 Bay3_Arm3	373,68 ml	ppm	1234
6 Bay30_Arm30	876,31 ml	Additive volume	123,456,78 ml
7 Bay3_Arm2	358,08 ml	Load volume	123,456,789 kg
8 Bay7_Arm2	543,21 ml		
9 Bay8_Arm3	323,43 ml		
10 Bay8_Arm2	458,04 ml		
11 Bay9_Arm3	345,67 ml		
12 Bay10_Arm3	660,00 ml		

GUIDANT

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 six preset controller devices or SCADA HMI/TAS control systems for injection management.

A Better Solution

Multiple Masters

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

Rapid Startup

Enabled by the Calibration Wizard and 60-second configuration. Configurable, expandable I/O and scalable functionality using 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-inch color display.

Real-Time Diagnostics

Multiple diagnostics dashboards (stream, I/O type, system health, Ethernet and serial Communications) and switch-count register for every I/O.

With over 90 years of innovative measurement solutions experience, Guidant is an industry leader offering the most advanced measurement solutions portfolio on the market.

The Fusion4 Multistream Controller Additive (MSC-A) is an intelligent, hazardous-area additive injection controller with 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 input/output 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.



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, so you know as soon as the precision of your additive operation is compromised.

Connectivity Is Key

MSC-A includes a wide range of built-in protocol libraries and communication network capabilities. Supporting up to seven serial and three Ethernet ports, it integrates seamlessly with industry-standard systems like TAS, DCS, PLC, SCADA HMI, or third-party batch controllers to enable connectivity and protect your existing investments.

Flexible I/O and Interfacing

The Fusion4 MSC-A enables you to assign functions to any input or output with configurable I/O. Flexible interfacing is possible using the Local Access Device (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, ensuring 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 diagnostic dashboards are available for complete hardware and communications monitoring from a single screen to improve reliability and reduce maintenance time.

Efficient Configuration and Updates

Configure your new Fusion4 MSC-A in less than 60 seconds with the optional smart, handheld LAD for a faster, more efficient start-up, and use the LAD again to update firmware live in the field, boosting productivity.

You won't 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 you to make the right operational and business decisions for your site. Control optimization, transaction traceability, calibration security, and enhanced diagnostic tracking are all facilitated by this advanced level of data, leaving you without a shred of doubt about the effectiveness of your additive operations.

Multiple Language Support

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

Full System Control

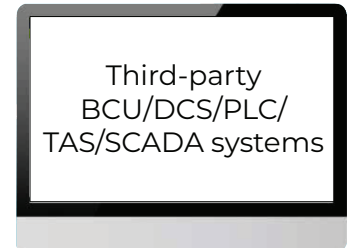
With modular expansion pack upgradability, the MSC-A has the I/O capability to manage all peripheral system elements, such as pump starting, tank level monitoring, block valve control, and system pressure and temperature monitoring.



Fusion4 Portal

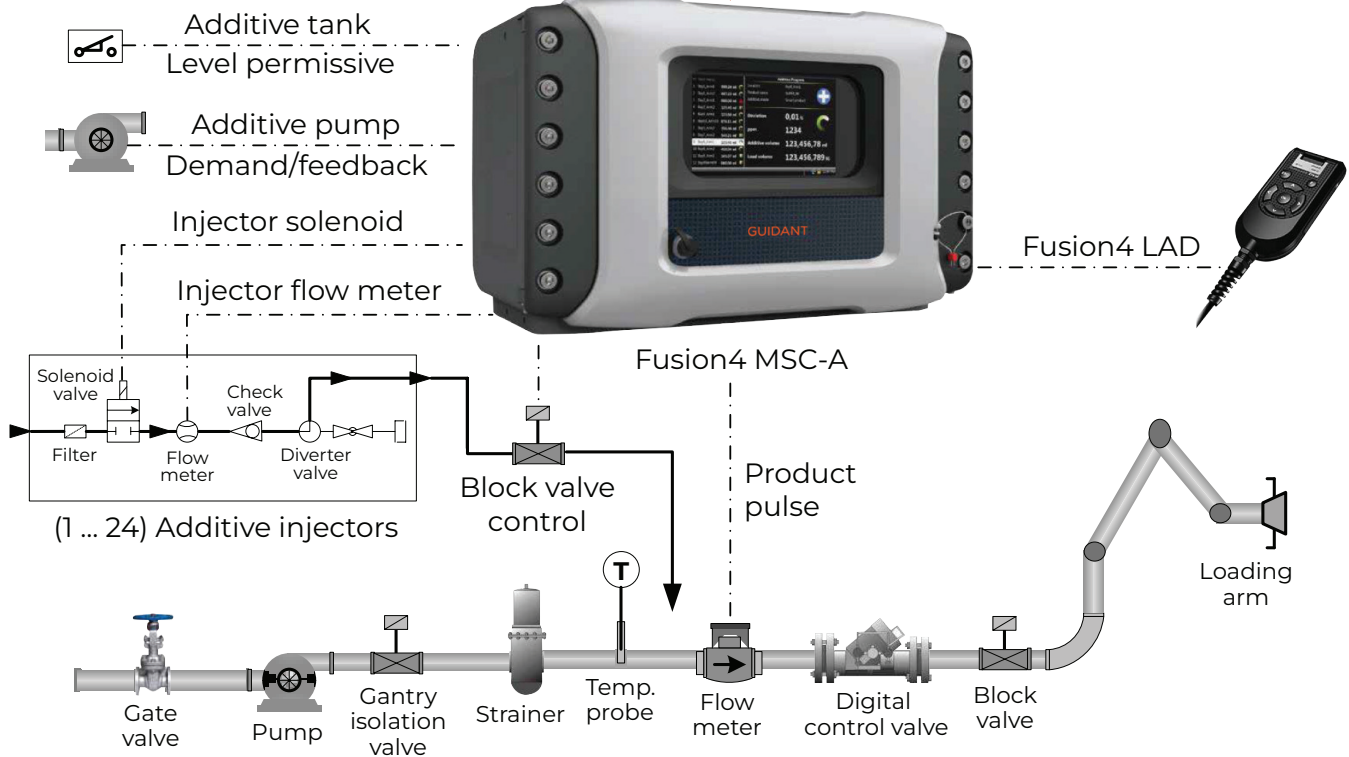


Fusion4 MSC-L



Third-party
BCU/DCS/PLC/
TAS/SCADA systems

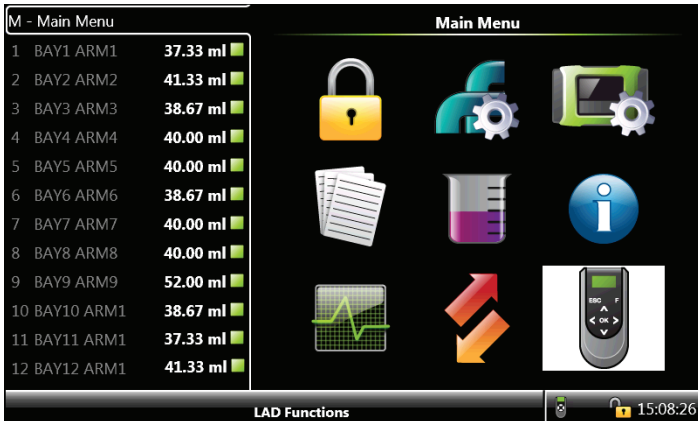
Protocol support: SLIP+, FLEXCONN, Smith, Modbus RTU, and Modbus Legacy
Pacing modes: Smart, secondary, and self
Communication ports: Up to seven serial and up to three ethernet ports



Graphic representation showing a basic setup of the additive controller. Additional interfaces might be needed based on site requirements.

A Smarter User Interface

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



M - Main Menu	
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	
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
Dagtotalen	
Aantal trans.	0
Totaal volume	0 L

Features and Benefits

- The events log stores 2,000 entries, recording key events on each device to enhance security, such as sealing or operator logins
- The last 1,000 calibration records are stored for robust auditing of loading arm proving operations
- The Calibration Wizard minimizes proving downtime for automated proving process and record capture
- The diagnostics dashboard provides a real-time operational overview of all device inputs and outputs
- You can import device configurations for rapid device start-ups in under a minute, in the field via LAD or remotely via the Fusion4 Portal
- The modular I/O allow plugin upgrades the system in comprehensive, efficient steps
- On-device configurable I/O enables device functionality to be reassigned at will to accommodate new system setups
- Device firmware is upgradable without opening the enclosure or powering down
- SMART additive injection volume corrections during a transaction ensure on-spec additive delivery

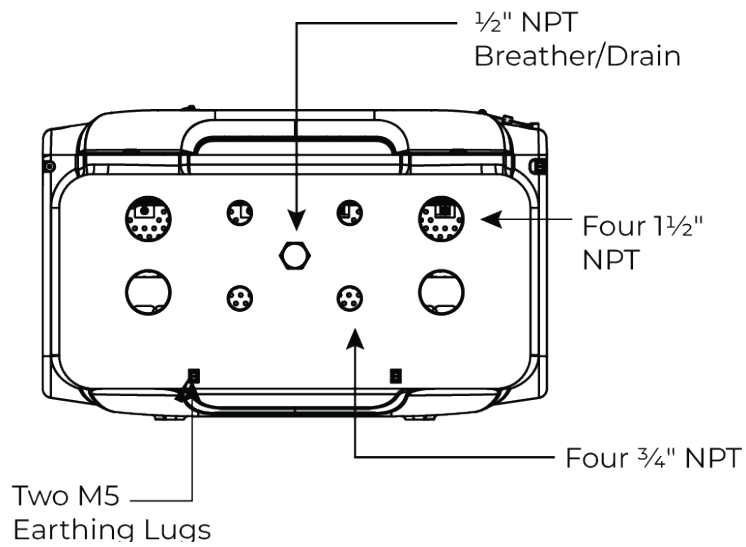
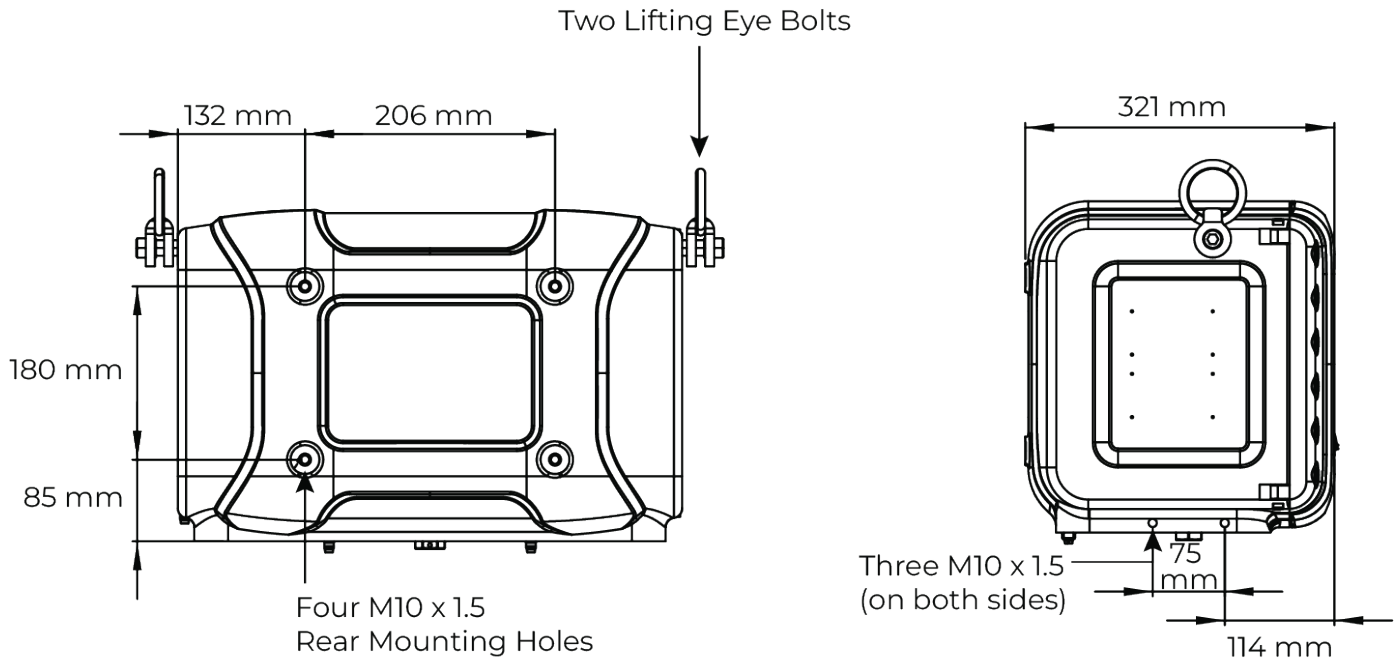
Superior Application Flexibility

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

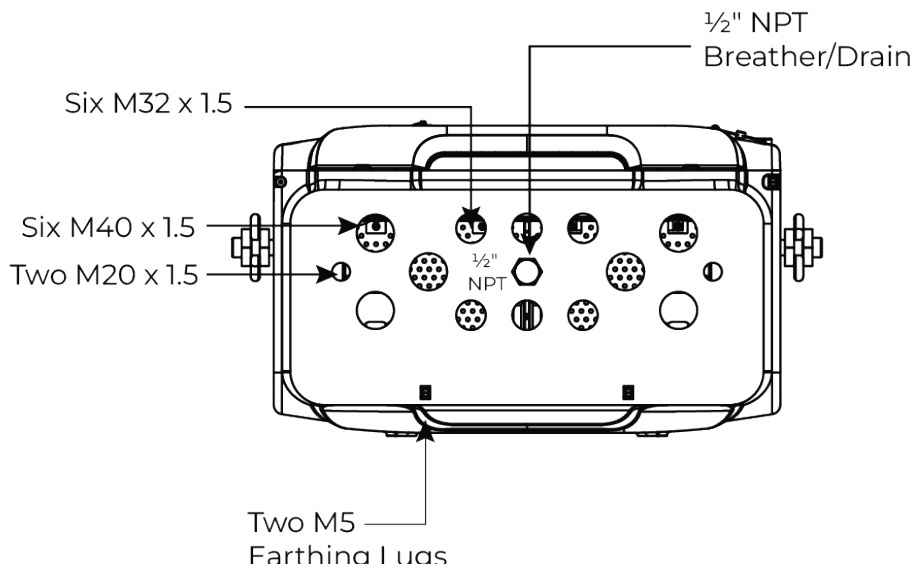
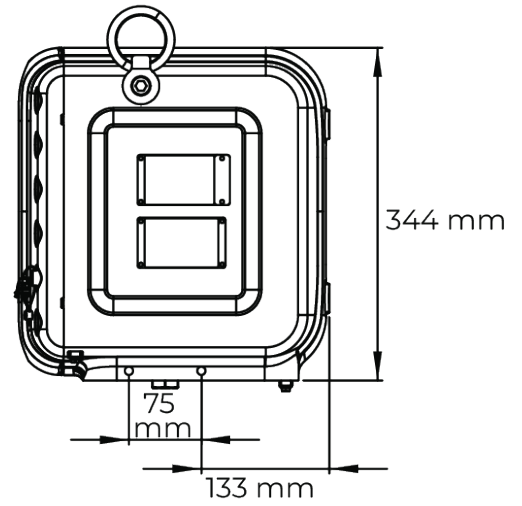
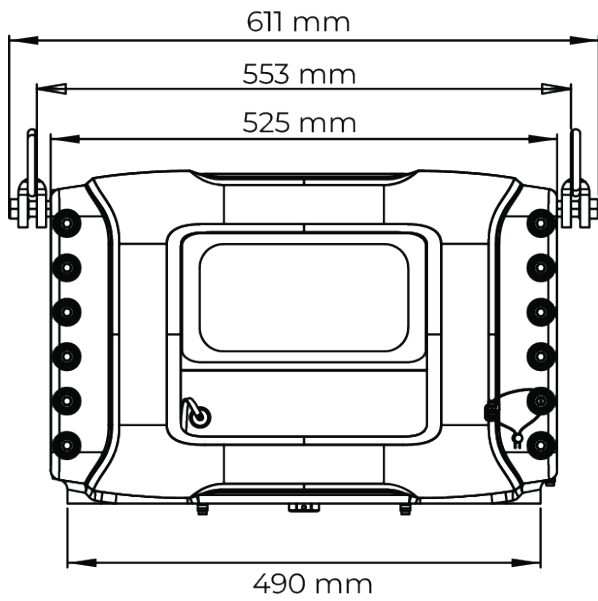
	Basic Applications	Standard Applications	Advanced Applications
Functionalities	Requires Basic I/O and Functionalities	Requires More I/O and Minimal Functionalities	Requires Complete I/O and Functionalities
Additive flow pulses • Hard wired	✓	✓	✓
Solenoid control • Hard wired	✓	✓	✓
Additive volume output • Hard wired • Communications	✓	✓	✓
Permissive enable • Hard wired • Communications • Fusion4 LAD	✓	✓	✓
Alarm reset • Hard wired • Communications • Fusion4 LAD	✓	✓	✓
Alarm indication • Hard wired • Communications	✓	✓	✓
Alarm shutdown • Hard wired • Communications	✓	✓	✓
Pump start • Hard wired		✓	✓
Pump feedback • Hard wired		✓	✓
Start clean arm • Hard wired • Communications		✓	✓
Inject-now signal • Hard wired • Communications		✓	✓
Injection recipe (b/w batches) • Communications • Fusion4 LAD		✓	✓
Self paced • Configurable timer			✓
Injection feedback • Hard wired			✓
Analog additive volume output • Hard wired			✓
External solenoid or block valve control • Hard wired			✓
System interlock • Hard wired • Communications			✓
Tank empty • Hard wired			✓
Tank low level • Hard wired			✓

Technical Specifications

Dimensional Drawings of MSC-A NPT Assembly



Dimensional Drawings of MSC-A Metric Assembly



Programmable Setup Parameters

Stream Configuration	
Identification	Bay name, arm name, product name, product symbol, and hazardous materials (HAZMAT) classification
Stream Address	000-999 (default is 123)
Stream I/O Binding	
Number of Streams	Dependent on the additive mode and expansion pack license of one 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, and external 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 up to 12 characters
Additive Mode	Smart (Comm, direct input (DI), AI, and pulse), slave, and self
Injection Point	Upstream and downstream
Permissive Condition	"Or" (one of the system interlocks) and "and" (both of the system interlocks)
Factored Pulse	1 to 1,000 pulses per unit
Injection Volume Unit	Milliliter (default) and cubic centimeter
Volume Per Injection Cycle Unit	Liter, cubic meter, cubic centimeter, cubic decimeter, US gallons, UK gallons, and barrel
Injection Offset	0 to 100%
Self-Pace Injection Period	1 to 32 seconds
Feedback Mode	None (default), end-sensor switch, inverted end-sensor, mid-stroke switch, piston switch, inverted piston switch, post injection, double pulse, last 25% , external piston emulation, inv. ext. piston emulation
Feedback Pulse Duration	0 to 1,000 milliseconds (ms) (default is 500 ms)
Piston Control Emulation	True or false
Pump Run Timeout	1 to 255 minutes (min) (default is 10 min)
Calibration	Manual and wizard-based
Communication Mode	
Protocol	SLIP+, FlexConn, Smith, Modbus remote terminal unit (RTU), and Modbus Legacy
Communication Mode	Ethernet (up to three ports)/RS485 (up to seven ports)
Alarms, Faults, and Alarm Actions	
Alarm Actions	Disable, display, and display - shutdown
Alarms and Faults	Leaking volume limit, leaking timeout period, flush-volume deviation, no activity timeout, no additive timeout, pump feedback timeout, additive volume deviation, number cycles for alarm, control fault, block valve fault, solenoid fault, pulse phase, factored pulse out, temperature sensor, tank low level, and tank empty

Approvals

Ex Approvals	Protection	Certificate
ATEX (EU)	II 2 G Ex db [ia] IIB T6 Gb	DEKRA 12ATEX0101X
IECEX (International)	Ex d [ia] IIB T6	IECEX DEK 12.0021X
FM (USA)	Class I, Division 1, Groups C and D, T6	FM18US0123
CSA (Canada)	CL I Div 1 Gr C&D T6/Zone 1 Ex d [ia] IIB T6 Gb	File Number 305885
PESO	Ex d [ia] IIB T6 Gb	Pending
UL-Brazil (Brazil)	Ex d [ia] IIB T6 Gb	UL-BR 25.1434X

Weights and Measures

NMI Netherlands Evaluation Certificate TC8779 Evaluated to OIML R-117 Recommendations for Accuracy Class 0.5

	SI Units	Imperial Units
Environmental		
Operating Temperature	-40 to 65 °C	-40 to 185 °F
Storage Temperature	-40 to 85 °C	-40 to 185 °F
Protection Class	IP66	NEMA 4X
Humidity	5 to 95% noncondensing	5 to 95% noncondensing
Materials		
Enclosure	Aluminum, anodized	Aluminum, anodized
Connections		
Cable Entries	Six M40, six M32, and two M20	Four 1 1/2" National Pipe Thread (NPT) Four 3/4" NPT
Electrical		
Voltage	88 to 264 volts alternating current (VAC)	88 to 264 VAC
Flow Meter Inputs	Twelve 10-kilohertz (kHz) input	24 10-kHz input
Interface		
Serial Protocols	FlexConn, Modbus RTU, Slip+, Smith Meter	
Ethernet Protocols	FlexConn TCP/IP, Modbus TCP/IP	
Display	8-inch video graphics array (WVGA) color thin-film transistor (TFT) liquid crystal display	
Languages	English (US and UK), French, German, Spanish, Dutch, Mandarin, Japanese, Polish, Italian, and Portuguese	
Handheld Devices	Fusion4 LAD	
Weight		
MSC-A	Approximately 53 kilograms (kg)	Approximately 115 pounds (lb)

Modeling Code for Metric Cable Entries

Characterization Value (CV)	
CV 1 through 6	Model
HELC82	Fusion4 MSC-A Metric
CV 7	Enclosure
A	MSC-A Enclosure
CV 8	Firmware
A	Additive
CV 9	License I/O Expansion
A	Fusion4 MSC-A
B	Fusion4 MSC-A + Expansion Pack 1
C	Fusion4 MSC-A + Expansion Pack 2
D	Fusion4 MSC-A + Expansion Pack 3
H	Fusion 4 MSC-A + Expansion Pack 6
CV 10	Mounting Options
0	Not required
CV 11	Field Entry Plugs and Breather
Position 11-1	Breather
0	Not required
A	Breather
Position 11-2	Field Entry Plugs
0	Not require
1	Three M32, three M40, and one M20 Ex d blanking plugs (half)
2	Six M32, six M40, two M20 Ex d blanking plugs (full)
CV 12	Ex Approvals
A	ATEX
B	IECEX
C	PESO
G	INMETRO/UL Brazil

ATEX Sample Modeling Code

CV 1 through 6						7	8	9	10	11-1	11-2	12
H	E	L	C	8	2	A	A	A	0	A	1	A

Accessories—LAD ATEX, IECEX, PESO, and UL Brazil

Part Number	Description
323-1392004	Fusion4 LAD ATEX, IECEX, PESO, and UL Brazil (LAD)

Modeling Code for NPT Conduit Entries

Characterization Value (CV)	
CV 1 through 6	Model
HELC86	Fusion4 MSC-A NPT
CV 7	Enclosure
A	MSC Enclosure
CV 8	Firmware
A	Additive
CV 9	License I/O Expansion
A	Fusion4 MSC-A
B	Fusion4 MSC-A + Expansion Pack 1
C	Fusion4 MSC-A + Expansion Pack 2
D	Fusion4 MSC-A + Expansion Pack 3
H	Fusion 4 MSC-A + Expansion Pack 6
CV 10	Mounting Options
0	Not required
CV 11	Field Entry Plugs and Breather
11-1	Breather
0	Not required
A	Breather
11-2	Field Entry Plugs
0	Not required
3	FM Full Set - 41 1/4", 4 x 1" NPT Blanking Plugs
CV 12	Ex Approvals
E	FM
F	CSA
G	INMETRO/UL Brazil

Typical Modeling Code

1 through 6					7	8	9	10	11-1	11-2	12	
H	E	L	C	8	6	A	A	A	0	A	3	E

Accessories—LAD FM

Part Number	Description
323-1392002	Fusion4 LAD FM (Local Access Device)

Expansion Pack Details

Licenses	A	B	C	D	H
Expansion Pack	Fusion4 MSC-A	Fusion4 MSC-A and EXP1	Fusion4 MSC-A and EXP2	Fusion4 MSC-A and EXP3	Fusion4 MSC-A and EXP6
Typical Application	<p>Cost-effective, communication-based control with no field I/O requirements; includes multiple serial comms</p> <ul style="list-style-type: none"> Up to 12 injectors—comms pacing Up to six injectors—high-frequency pulse pacing Up to 12 injectors—self pace mode Each injector requires one SPI and one AC output Each optional blocking solenoid requires an additional AC output 	<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"> Up to 12 injectors—comms pacing Up to six injectors—high-frequency pulse pacing Up to 12 injectors—hardwired Inject Now pacing Up to 12 injectors—self-pace mode Each injector requires one SPI and one AC output Each optional blocking solenoid requires an additional AC output 	<p>Advanced capability permitting enhanced field I/O requirements, including analog and RTD, as well as multiple serial comms and Ethernet</p> <ul style="list-style-type: none"> Up to 12 injectors—comms pacing Up to six injectors—high-frequency pulse pacing Up to 12 injectors—hardwired Inject Now pacing Up to 12 injectors—self-pace mode Up to seven injectors analogue pacing Each injector requires one SPI and one AC output Each optional blocking solenoid requires an additional AC output 	<p>Superior capability permitting full high-frequency pacing and optimum field I/O functionality for total system control and redundancy</p> <ul style="list-style-type: none"> Up to 12 injectors—comms pacing Up to 12 injectors—high-frequency pulse pacing Up to 12 injectors—hardwired Inject Now pacing Up to 12 injectors—self-pace mode Up to 12 injectors analogue pacing Each injector requires one SPI and one AC output Each optional blocking solenoid requires an additional AC output 	<p>Superior capability permitting full high-frequency pacing and optimum field I/O functionality for total system control and redundancy</p> <ul style="list-style-type: none"> Up to 24 injectors—comms pacing Up to 12 injectors—high-frequency pulse pacing Up to 12 injectors—hardwired DI-AC Inject Now Up to 24 injectors—hardwired DI-DC Inject Now pacing Up to 24 injectors—self-pace mode Up to 12 injectors analogue pacing Each injector requires one SPI and one AC output Each optional blocking solenoid requires an additional AC output (SSR) or (EMR)
Hardware Included (EXP Additions in Bold)	One Backplane 1 One CAN-PSF One CAN-ARM One Fuse Board	One Backplane 1 One CAN-PSF One CAN-ARM One Fuse Board One CAN-IN-OUT	One Backplane 1 One CAN-PSF One CAN-ARM One Fuse Board One CAN-IN-OUT	One Backplane 1 One Backplane 2 One CAN-PSF Two CAN-ARM Two Fuse Board Two CAN-IN-OUT	One Backplane 1 One Backplane 2 Two CAN-PSF Two CAN-ARM Two Fuse Board Four CAN-IN-OUT
Ethernet Ports	0	1	1	3	3
RS485 Comms Ports (two-wire)	2	2	4	6	6
RS485 Comms Ports (four-wire)	1	1	1	1	1
Single Pulse Inputs (SPI_hi_freq)	12	12	12	24	24
AC Outputs (DO-SSR)	12	16	20	32	40
AC/DC Outputs (DO-EMR)	0	10	20	32	40
AC Inputs (DI-AC)	0	3	6	6	12
DC Inputs (DI-DC)	0	15	30	30	60
Analogue Outputs (AO)	0	0	3	4	6
Analogue Inputs (AI)	0	0	7	14	14
RTDs	0	0	3	6	6
Pulse Output (PO) (real time/factored)	2	2	2	4	4

Discover More Products in the Fusion4 Portfolio

Fusion4 MultiPak

Fusion4 MultiPak is a complete, off-the-shelf additive solution that integrates the industry's most-used additive injection block—Mono-Block—with an additive injection skid for the most complex applications.

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 integrates additive injector panels with the Fusion4 MSC-A on a free-standing frame, providing rapid installation and reduced commissioning time.



Fusion4 Portal

The Fusion4 Portal software suite brings together wide-ranging remote monitoring and supervisory capabilities for all Fusion4 devices in a single, integrated dashboard.

Available as a modular package, you can bundle the functional modules you need to print transactions (bills of lading), monitor real-time audit trails, and optimize settings to get your operations up and running quicker.





Main Menu

1. Bay1_Arm1	888.29 ml	Location	Bay1_Arm1
2. Bay1_Arm2	887.23 ml	Product name	ULPFX_30
3. Bay1_Arm3	890.08 ml	Additive mode	Smart product
4. Bay1_Arm4	873.04 ml	Deviation	0,01 %
5. Bay10_Arm1	874.31 ml	ppm	1234
6. Bay10_Arm2	854.06 ml	Additive volume	123,456,78 ml
7. Bay10_Arm3	822.90 ml	Load volume	123,456,789 kg
8. Bay10_Arm4	843.21 ml		
9. Bay10_Arm5	854.06 ml		
10. Bay10_Arm6	854.06 ml		
11. Bay10_Arm7	843.21 ml		
12. Bay10_Arm8	888.00 ml		

GUIDANT



About Guidant

As the undisputed leader in liquid and gas custody transfer solutions with the largest global install base, Guidant's legacy is built on more than 90 years of expertise, accuracy, reliability, and best-in-class technologies. We are a private company focused on the measurement solutions business, serving emerging and established energy markets across the globe.

Corporate Website

GuidantMeasurement.com

Guidant Knowledge Base

KB.GuidantMeasurement.com

Email

[Guidant_Communications@](mailto:Guidant_Communications@GuidantMeasurement.com)

[GuidantMeasurement.com](mailto:Guidant_Communications@GuidantMeasurement.com)

Measurement Products

Global Sales

+1 814.898.5000

24/7 Service and Support

- **Eastern Hemisphere**

[ResponseCenter.MS@](mailto:ResponseCenter.MS@GuidantMeasurement.com)

[GuidantMeasurement.com](mailto:ResponseCenter.MS@GuidantMeasurement.com)

+49 4101 304 333

- **Western Hemisphere**

[MS.ResponseCenter@](mailto:MS.ResponseCenter@GuidantMeasurement.com)

[GuidantMeasurement.com](mailto:MS.ResponseCenter@GuidantMeasurement.com)

+1 844.203.4014