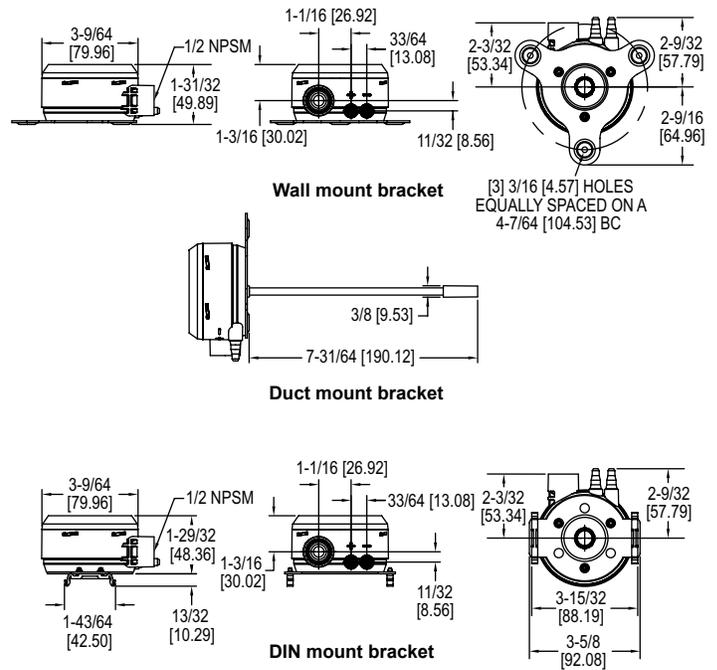




Series MSX-Comms Magnesense® Pressure Transmitter

Specifications - Installation and Operating Instructions



The Series MSX-Comms Magnesense® Pressure Transmitter monitors differential pressure in building control applications. To meet varying system requirements, the MSX-Comms is capable of monitoring uni- or bidirectional pressure in multiple ranges, calculating linear pressure, velocity, or flow, and delivering outputs in specified units (in w.c., mm w.c., pa) via Modbus® or BACnet protocol.

OPTIONS				
Range	in w.c.	Pa low	Pa high	mm w.c.
Range 0	0.1	25	60	2.5
	0.15	30	75	5
	0.25	40	100	10
	0.5*	50	125*	12*
Range 1	0.1	25	100	2.5
	0.25	40	150	5
	0.5	50	160	10
	1*	60	250*	25*
Range 2	1	250	600	25
	2	300	750	50
	3	400	1000	100
	5*	500	1250*	125*
Range 3	10	1000	3000	250
	15	1500	4000	350
	25	2000	5000	500
	28*	2500	7000*	700*
Range 4	1	250	1000	25
	5	300	2000	125
	10	400	3000	250
	15*	500	4000*	400*

*Indicated values are the positive full scale output values per range.

SPECIFICATIONS

Service: Air and non-combustible, compatible gases.
Wetted Materials: Consult factory.
Accuracy: ±1% FSO.
Stability: ±1% FSO/year.
Temperature Limits: -4 to 158°F (-20 to 70°C).
Pressure Limits: Ranges 0 and 1: 3.6 psi max operation, 6 psi burst; Ranges 2, 3, and 4: 6 psi max operation, 6 psi burst.
Power Requirements: 10-36 VDC (2-wire), 17-36 VDC or isolated 21.6-33 VAC (3-wire).
Output Signals: TIA/EIA-485.
Response Time (90%): Instant (configurable up to 30 s with LCD).
Zero and Span Adjustments: Digital push-button or via protocol.
Power Consumption: DC: 0.5 W or AC: 0.5 VA.
Display (optional): 4-digit LCD.
Electrical Connections: 4-position removable terminal block for 16 to 26 AWG.
Electrical Entry: 1/2" NPS thread.
Communication: BACnet MS/TP or Modbus® RTU.
Supported Baud Rates: 9600, 19200, 38400, 57600, 76800, 115200.
Device Load: 1/8 unit load.
Electrical Entry: 1/2" NPS thread.
Process Connections: 1/8", 3/16", 1/4", 5 mm, and 6 mm ID flexible tubing.
Enclosure Rating: NEMA 4X (IP66); UL 2043 (Plenum); UL94 V-0.
Mounting Orientation: Pressure sensor measurement unaffected by orientation.
Weight: 8.0 oz (230 g).
Compliance: BTL, CE.

INSTALLATION GUIDE

Surface Mounting

Fasten the transmitter to the surface using #8 x 1/2" pan head screws suited for the mounting surface material. Do not over tighten.

Duct Mounting (Universal Model Only)

Mount the transmitter away from fans, corners, coils, and other equipment that may impact pressure measurements.

1. Determine the position for the center of the transmitter and mark for drilling.
2. Drill a 9/16" hole into the duct.
3. Thread the duct probe into rear of housing. Insert probe into the duct.
4. Press the transmitter against the duct and use mounting flange as a template to mark hole locations.
5. Drill 1/8" holes.
6. Attach mounting flange to duct using #8 x 1/2" pan head sheet metal screws. Do not over-tighten.
7. Place the included cap on the exterior positive [+] pressure port.

The Universal model can also function as a standard wall-mount transmitter. Before mounting, insert the included plug into the duct probe port.

ELECTRICAL

Wiring Guide

CAUTION DO NOT EXCEED SPECIFIED SUPPLY VOLTAGE RATINGS. PERMANENT DAMAGE NOT COVERED BY WARRANTY WILL RESULT. SIMULTANEOUS OUTPUTS ARE NOT DESIGNED FOR AC VOLTAGE OPERATION.

NOTICE Communications connections must be wired in series. Star connections are not permitted.

NOTICE Cable shield must be connected to earth ground at one location only

NOTICE If equipped with an LCD, the display must be removed before wiring. Remove the cover and pull the LCD directly away from the housing. Reinstall after wiring.

When using a dedicated power supply for a single transmitter, use a twisted wire pair for data transmission (B[+]/A[-]) and a single wire for ground (COM). Both AC and DC supplies are suitable for this configuration. See Figure 1.

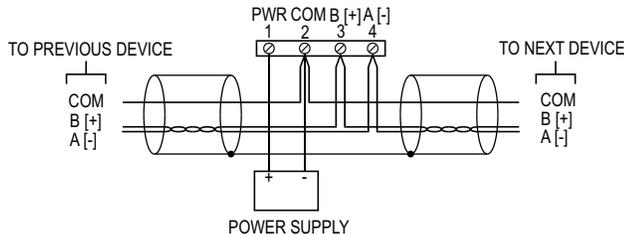


Figure 1: Local power supply

When using a single supply wired to multiple transmitters, follow the wiring example shown in Figure 2. This configuration utilizes two (2) twisted wire pairs, one pair for power (PWR) and ground (COM), and one pair for data transmission (B[+]/A[-]). Transmitters must be wired in series. See Figure 2.

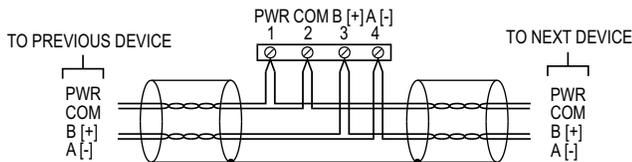


Figure 2: Common power supply

You must use a DC power supply rated for 10-36 VDC. This configuration is not suitable for AC power supplies.

NOTICE Wiring should comply with Electrical Characteristics of Generators and Receivers for Use in Balanced Digital Multipoint Systems, TIA/EIA-485-A-1998, Telecommunications Industry Association, 1998.

NOTICE Wiring should comply with Modbus Communication Protocol over Serial Line Specification and Implementation Guide V1.02, Modbus Organization, Inc., 2006 Wiring should comply with ANSI/ASHRAE Standard 135- 2010 BACnet A Data Communication Protocol for Building Automation and Control Networks, American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc., 2010.

LCD AND MENUS

Rotate the Display

The display mounts to the top of the circuit board. For applications where the housing is mounted upside down (ports pointing upwards), remove the cover, pull the display straight away from the board, rotate 180°, and reinstall.

PROGRAM MENU

Home Menu

During normal operation, the display will be in the Home Menu and will display the current measured pressure and the engineering units.

Menu Access Security

By default, a PIN code is not required to enter the configuration menus. However, if access to the menus needs to be restricted, follow the steps below.

1. While in the Home Menu, press and hold the Zero and Span buttons until "PIN" is displayed.
2. Press and hold the Zero and Span buttons until the current PIN setting is displayed (default is 0000).
3. Use the Zero button to increment the selected digit (denoted by the caron ◌) or press the Span button to select the next digit to the right.
4. Any value between 0001 and 9999 will result in the requirement to enter the PIN each time the menu is entered. The value 0000 will disable the PIN entry requirement.
5. Press and hold the Span button until the next menu is displayed. PIN security set up is now complete.

Error Indications

If the transmitter is equipped with an LCD, the following messages are displayed when an error is encountered. This device is equipped with a red status LED. Status codes are indicated by the LED using a sequence of flashes. Status codes are repeated continuously as long as the condition persists.

LCD ERROR MESSAGES		
LCD Message	LED Code	Error Condition
-	1	Intelligent serial configuration active
-	99	Alarm active
EADR OVER	2	Invalid address configured
UNDR	3	The applied pressure is 5% greater than the positive model span pressure causing an Over Range Error
FAIL	4	The applied pressure is 5% less than the negative model span pressure causing an Under Range Error
ER 1	-	When the span button is pressed, the pressure value is out of the range to allow a correct setting
ER 1	11	The pressure applied to the sensor is beyond its ability to read
ER 2	12	The pressure sensor is communicating but reporting an internal error
ER 3	13	The pressure sensor is not communicating
ER 4	14	The stored user settings are invalid
ER 5	15	The stored factory settings are invalid
ER 6	16	Non-volatile user memory has failed
ER 7	17	Non-volatile factory memory has failed

CALIBRATION

You can calibrate the transmitter manually, or via communication protocol. For detailed instructions on calibrating via protocol, see Zero calibration - Modbus® or Zero calibration - BACnet.

Zero Calibration

Use the zero calibration to reset the transmitter's baseline reading. With no pressure applied the transmitter, press and hold Zero for 3 seconds. If the transmitter is equipped with an LCD, ZERO is displayed on the screen before returning to the Home menu.

Span Calibration

When calibrating span, the applied pressure at the time of calibration is recorded as the maximum pressure.

1. Perform a zero calibration.
2. Apply a pressure equal to the span values of the specific model purchased.
3. Press and hold the Span button for 3 seconds. If the transmitter is equipped with an LCD, SPAN is displayed on the screen before returning to the Home menu.

Note: After releasing the Span button, there is a 3-second delay before the calibration is recognized.

COMMUNICATION PROTOCOL CONFIGURATION

The following sections detail configurations that apply to Modbus® and BACnet protocols.

Setting Protocol Address

Use the DIP switches to set the protocol address that the control system uses to recognize the transmitter. Each DIP switch is assigned a value:

Dip Switch	1	2	3	4	5	6	7	8
Value	128	64	32	16	8	4	2	1

To determine the address for a transmitter, set the DIP switches and add the corresponding values for any switches in the ON position.

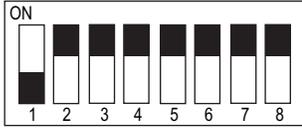


Figure 3



Figure 4

In Figure 3, where DIP switches 2-8 are in the ON position, the address is 127 (64+32+16+8+4+2+1=127). In Figure 4, where only DIP switch 5 is in the ON position, the address is 008.

Note: Modbus® addresses must be between 001 and 247. BACnet addresses must be between 000 and 127. An error message is displayed if an address is assigned outside of these acceptable ranges.

SUPPORTED BAUD RATES					
	Mode	Baud Rates	Data Size	Parity	Stop Bits
Modbus®	RTU	9600	8	Even Odd None	1, 2
		19200			
		38400			
		57600			
		76800 115200			
BACnet	MS/TP	9600	8	None	1
		19200			
		38400			
		57600			
		76800 115200			

Intelligent Serial Configuration

The Intelligent Serial Configuration feature enables the device to determine the baud rate, parity, and stop bits automatically from Modbus® or BACnet serial traffic.

To perform Intelligent Serial Configuration:

1. Remove power from the transmitter.
2. Use the DIP switches to set a valid protocol address.
3. Reapply power.
The red LED will blink steadily when the transmitter begins monitoring for serial traffic.
4. (Optional) If setting up a transmitter offline or away from the main network, you must send read requests to the unit manually.

The configuration process is complete after the device has successfully received and processed a request. If a change to the system requires updated serial configuration, power cycle the device to reconfigure.

MODBUS® PROTOCOL REFERENCE

The following sections explain transmitter functions in systems employing Modbus® communications protocol.

Functions

The MSX-Comms supports the following Modbus® functions:

Code	Function
01	Read coil status
03	Read holding registers
04	Read input registers
05	Write single coil
06	Write single register
16	Write multiple registers

The string data type is read as a stream of ASCII characters, with the first character sent in the MSB of the first register, and the second character sent in the LSB of the first register and so on. If the string is shorter than the allotted size, the remaining bytes are zero-padded.

Coils

Coil 1 - Zero calibration

The pressure sensor may drift over time causing a shift in the baseline reading. If this occurs, use the zero calibration function to reset the baseline for the transmitter.

Before performing a zero calibration, ensure only atmospheric pressure is applied to the transmitter.

To execute the zero calibration function, write a value of 1 to the coil 1 register. The value for this coil register will automatically return to 0 after the calibration is complete.

Coil 4 - Reset device

The reset device function allows you to reset the factory settings of the device remotely. To execute the reset device function, write a value of 1 to the coil 4 register. The device will reset after approximately five seconds.

Multi-address support

Multi-Address support allows a register to be read or written to using different byte orientations as specified by the address range. For example, input register 0003 can also be read at 2003, 4003 and 6003 with different byte orientations as listed in the table below. Registers that do not have multi-address support are only available in BigEndian byte orientation (Modbus Communication Protocol standard).

Byte Order	Address Range	Float/32-bit Values				16-bit Values	
		Register 1		Register 2		Register 1	
		MSB	LSB	MSB	LSB	MSB	LSB
Big-Endian	1-2000	A	B	C	D	A	B
Byte swap	2001-4000	B	A	D	C	B	A
Word swap	4001-6000	C	D	A	B	A	B
Little-Endian	6001-8000	D	C	B	A	B	A

MAINTENANCE/REPAIR

Upon final installation of the Series MSX-Comms, no routine maintenance is required. The Series MSX-Comms is not field serviceable and should be returned if repair is needed. Field repair should not be attempted and may void warranty.



This symbol indicates waste electrical products should not be disposed of with household waste. Please recycle where facilities exist. Check with your Local Authority or retailer for recycling advice.

WARRANTY/RETURN

Refer to "Terms and Conditions of Sale" in our catalog and on our website. Contact customer service to receive a Return Materials Authorization (RMA) number before shipping the product back for repair. Be sure to include a brief description of the problem plus any additional application notes.

BACNET PROTOCOL REFERENCE

The following sections explain transmitter functions in systems employing a BACnet protocol.

Objects

This device supports the following objects:

Object Type	Identifier	Name
Device	607XXX*	MSX 607XXX
Analog Input	AI1	Pressure in w.c
	AI2	Pressure Pascals
	AI3	Pressure kilo-Pascals
	AI4	Pressure mm w.c.
Analog Value	AV1	Velocity FPM
	AV2	Velocity MPS
	AV3	Flow CFM
	AV4	Flow CMH
	AV5	Velocity K Value
	AV6	Flow Area sq ft
	AV8	Flow Area sq m
	AV9	Alarm High Limit
	AV10	Alarm Low Limit
	Binary value	BV2
BV5		Alarm High Limit Enable
BV6		Alarm High Limit Status
BV7		Alarm Low Limit Enable
Multi-state value	MSV1	Process Mode
	PIV1	Damping Time

*XXX is replaced by the address value set by the DIP switches.

Note: No supported objects are dynamically creatable or deletable.

Accessing measurements

The four analog inputs (AI1-AI4) transmit the pressure measurement in the desired engineering units.

Analog value objects AV1-AV4 transmit velocity and flow values in the desired engineering units. Analog value objects AV5 and AV6 are variables used to calculate these values. The velocity K Factor in AV5 can be set from 0.001-9.999. The duct area in AV6 can be set from 0-25 (measured in sq. feet).

Zero calibration

Over time the pressure sensor may drift, causing a shift in the baseline reading. If this occurs, use the zero calibration function to reset the baseline for the transmitter. Before performing a zero calibration, ensure only atmospheric pressure is applied to the transmitter.

To execute a zero calibration, set the value of object BV2 to Active (1).

BACnet services

The MSX-Comms supports the following BACnet BIBB services and functions:

- **Device Communication Control-B (DM-DCC-B):** Optional time duration in minutes
- **Reinitialize Device (DM-RD-B):** COLDSTART and WARMSTART

The password required to execute these functions: **Dwyer**

APPENDICES

Modbus® Registers

Start Address	Field Name	No. of Registers	Data Type
1	Pressure in 0.001 in w.c.	1	16bit integer
2	Pressure in Pa	1	16bit integer
3	Pressure in in w.c.	2	float
5	Pressure in Pa	2	float
7	Pressure in mm w.c.	2	float
9	Pressure in kPa	2	float
11	Velocity in FPM	2	float
13	Velocity in MPS	2	float
15	Flow in CFM	2	float
17	Flow in CMH	2	float
19	reserved	1	16bit integer
20	reserved	1	16bit integer
21	reserved	1	16bit integer
22	reserved	1	16bit integer
23	Error Flags	2	uint32
8001	Model Number	16	String(32)
8017	Serial Number	4	String(8)
8021	Firmware Version	8	String(16)
8029	Date Code	4	String(8)

Start Address	Field Name	Data Type	Range
1	Reserved	uint16	
2	Velocity K Factor	float	0.001-9.999
4	Flow Area SqFt	float	0.125 - 25 ft ²
6	Flow Area SqM	float	0.01161288 - 2.322576 m ²
8	Device Name	String(32)	
24	Process Mode	uint16	0=Pressure, 1=Velocity, 2=Flow
25	Pressure Unit	uint16	0=inWC, 1=mmWC, 2=Pa, 3=kPa
26	Velocity Unit	uint16	0=ft/min, 1=m/s
27	Flow Unit	uint16	0=ft ³ /min, 1=m ³ /h
28	Enable High Alarm Limit	uint16	0=Disabled, 1=Enabled
29	High Alarm Limit	float	Value/unit based on Unit/Mode value
31	Enable Low Alarm Limit	uint16	0=Disabled, 1=Enabled
32	Low Alarm Limit	float	Value/unit based on Unit/Mode value
34	Alarm High Limit Status	uint16	0=Inactive, 1=Active
35	Alarm Low Limit Status	uint16	0=Inactive, 1=Active
36	Damping Time	uint16	0-30

I. BACNET DEVICE OBJECTS

Property	Default Value	Is (User) Writable	Data Type
Object Identifier	DEV607xxx	Yes	Object Identifier
Object Name	"MSX 607xxx"	Yes	Character String (32)
Object Type	Device	No	Object Type
System Status	Operational	No	Device Status
Vendor Name	"Dwyer Instruments, Inc."	No	Character String
Vendor Identifier	607	No	Unsigned
Model Name	"MSX-xxx-xxx"	No	Character String
Firmware Version	"x.x.x"	No	Character String
Application Software Version	"x.x"	No	Character String
Location	""	Yes	Character String (32)
Description	""	Yes	Character String (32)
Protocol Version	1	No	Unsigned
Protocol Revision	16	No	Unsigned
Protocol Services Supported	See BACnet Services tab	No	Services Supported
Protocol Object Types Supported	Refer to this tab	No	Object Types Supported
Object List	Refer to this tab	No	BACnetArray
Maximum APDU Length Accepted	480	No	Unsigned
Segmentation Supported	No Segmentation	No	Segmentation
APDU Timeout	0	No	Unsigned
Number of APDU Retires	0	No	Unsigned
Max Master	127	Yes	Unsigned
Max Info Frames	1	No	Unsigned
Device Address Binding	{}	No	Address Binding
Database Revision	0	No	Unsigned
Serial Number	"xxxxxx"	No	Character String

II: BACNET ANALOG INPUT OBJECTS

Property	Default Value	Is (User) Writable	Data Type
Object Identifier	AI1	No	Object Identifier
Object Name	"Pressure inWC"	No	Character String
Object Type	Analog Input	No	Object Type
Present Value	**current reading**	No	Real
Status Flags	{0,0,0,0}	No	Status Flags
Event State	Normal	No	Event State
Reliability	No Fault Detected	No	Reliability
Out of Service	FALSE	Yes	Boolean
Units	Inches of Water	No	Engineering Units

Property	Default Value	Is (User) Writable	Data Type
Object Identifier	AI2	No	Object Identifier
Object Name	"Pressure Pascals"	No	Character String
Object Type	Analog Input	No	Object Type
Present Value	**current reading**	No	Real
Status Flags	{0,0,0,0}	No	Status Flags
Event State	Normal	No	Event State
Reliability	No Fault Detected	No	Reliability
Out of Service	FALSE	Yes	Boolean
Units	Pascals	No	Engineering Units

Property	Default Value	Is (User) Writable	Data Type
Object Identifier	AI3	No	Object Identifier
Object Name	"Pressure Kilo-Pascals"	No	Character String
Object Type	Analog Input	No	Object Type
Present Value	**current reading**	No	Real
Status Flags	{0,0,0,0}	No	Status Flags
Event State	Normal	No	Event State
Reliability	No Fault Detected	No	Reliability
Out of Service	FALSE	Yes	Boolean
Units	Kilopascals	No	Engineering Units

Property	Default Value	Is (User) Writable	Data Type
Object Identifier	AI4	No	Object Identifier
Object Name	"Pressure mmWC"	No	Character String
Object Type	Analog Input	No	Object Type
Present Value	**current reading**	No	Real
Status Flags	{0,0,0,0}	No	Status Flags
Event State	Normal	No	Event State
Reliability	No Fault Detected	No	Reliability
Out of Service	FALSE	Yes	Boolean
Units	Millimeters of Water	No	Engineering Units

III. BACNET ANALOG VALUE OBJECTS

Property	Default Value	Is (User) Writable	Data Type
Object Identifier	AV1	No	Object Identifier
Object Name	"Velocity FPM"	No	Character String
Object Type	Analog Value	No	Object Type
Present Value	**current reading**	No	Real
Status Flags	{0,0,0,0}	No	Status Flags
Event State	Normal	No	Event State
Reliability	No Fault Detected	No	Reliability
Out of Service	FALSE	Yes	Boolean
Units	Feet per minute	No	Engineering Units

Property	Default Value	Is (User) Writable	Data Type
Object Identifier	AV2	No	Object Identifier
Object Name	"Velocity MPS"	No	Character String
Object Type	Analog Value	No	Object Type
Present Value	**current reading**	No	Real
Status Flags	{0,0,0,0}	No	Status Flags
Event State	Normal	No	Event State
Reliability	No Fault Detected	No	Reliability
Out of Service	FALSE	Yes	Boolean
Units	Meters per second	No	Engineering Units

Property	Default Value	Is (User) Writable	Data Type
Object Identifier	AV3	No	Object Identifier
Object Name	"Flow CFM"	No	Character String
Object Type	Analog Value	No	Object Type
Present Value	**current reading**	No	Real
Status Flags	{0,0,0,0}	No	Status Flags
Event State	Normal	No	Event State
Reliability	No Fault Detected	No	Reliability
Out of Service	FALSE	Yes	Boolean
Units	Cubic feet per minute	No	Engineering Units

Property	Default Value	Is (User) Writable	Data Type
Object Identifier	AV4	No	Object Identifier
Object Name	"Flow CMH"	No	Character String
Object Type	Analog Value	No	Object Type
Present Value	**current reading**	No	Real
Status Flags	{0,0,0,0}	No	Status Flags
Event State	Normal	No	Event State
Reliability	No Fault Detected	No	Reliability
Out of Service	FALSE	Yes	Boolean
Units	Cubic meters per hour	No	Engineering Units

Property	Default Value	Is (User) Writable	Data Type
Object Identifier	AV5	No	Object Identifier
Object Name	"Velocity K Value"	No	Character String
Object Type	Analog Value	No	Object Type
Present Value	1.000	No	Real
Status Flags	{0,0,0,0}	No	Status Flags
Event State	Normal	No	Event State
Reliability	No Fault Detected	No	Reliability
Out of Service	FALSE	Yes	Boolean
Units	no units	No	Engineering Units
Min-Max values	0.001 - 9.999	No	Real

Property	Default Value	Is (User) Writable	Data Type
Object Identifier	AV6	No	Object Identifier
Object Name	"Flow Area SqFt"	No	Character String
Object Type	Analog Value	No	Object Type
Present Value	1.000	No	Real
Status Flags	{0,0,0,0}	No	Status Flags
Event State	Normal	No	Event State
Reliability	No Fault Detected	No	Reliability
Out of Service	FALSE	Yes	Boolean
Units	Square feet	No	Engineering Units
Min - Max values	0.125 - 25	No	Real

Property	Default Value	Is (User) Writable	Data Type
Object Identifier	AV8	No	Object Identifier
Object Name	"Flow Area SqM"	No	Character String
Object Type	Analog Value	No	Object Type
Present Value	0.09290304	No	Real
Status Flags	{0,0,0,0}	No	Status Flags
Event State	Normal	No	Event State
Reliability	No Fault Detected	No	Reliability
Out of Service	FALSE	Yes	Boolean
Units	Square meters	No	Engineering Units
Min/Max values	0.01161288 - 2.322576	No	Real

Property	Default Value	Is (User) Writable	Data Type
Object Identifier	AV9	No	BACnet Object Identifier
Object Name	"Alarm High Limit"	No	Character String
Object Type	Analog Value	No	BACnet Object Type
Present Value	--model maximum pressure--	Yes	Real
Status Flags	{0,0,0,0}	No	BACnet Status Flags
Event State	Normal	No	BACnet Event State
Reliability	No Fault Detected	No	BACnet Reliability
Out of Service	FALSE	Yes	Boolean
Units	--unit of selected mode--	Yes	BACnet Engineering Units
MAX Pres Value	--dynamic--	No	Real
MIN Pres Value	--dynamic--	No	Real

Property	Default Value	Is (User) Writable	Data Type
Object Identifier	AV10	No	BACnet Object Identifier
Object Name	"Alarm Low Limit"	No	Character String
Object Type	Analog Value	No	BACnet Object Type
Present Value	0.000	Yes	Real
Status Flags	{0,0,0,0}	No	BACnet Status Flags
Event State	Normal	No	BACnet Event State
Reliability	No Fault Detected	No	BACnet Reliability
Out of Service	FALSE	Yes	Boolean
Units	--unit of selected mode--	Yes	BACnet Engineering Units
MAX Pres Value	--dynamic--	No	Real
MIN Pres Value	--dynamic--	No	Real

IV: BACNET BINARY VALUE OBJECTS

Property	Default Value	Is (User) Writable	Data Type
Object Identifier	BV2	No	Object Identifier
Object Name	"Zero"	No	Character String
Object Type	Binary-Value	No	Object Type
Present Value	Inactive	No	Binary
Status Flags	{0,0,0,0}	No	Status Flags
Event State	Normal	No	Event State
Reliability	No Fault Detected	No	Reliability
Out of Service	FALSE	Yes	Boolean

Property	Default Value	Is (User) Writable	Data Type
Object Identifier	BV5	No	Object Identifier
Object Name	"Alarm High Limit Enable"	No	Character String
Object Type	Binary-Value	No	Object Type
Present Value	Inactive	No	Binary
Status Flags	{0,0,0,0}	No	Status Flags
Event State	Normal	No	Event State
Reliability	No Fault Detected	No	Reliability
Out of Service	FALSE	Yes	Boolean

Property	Default Value	Is (User) Writable	Data Type
Object Identifier	BV6	No	Object Identifier
Object Name	"Alarm High Limit Status"	No	Character String
Object Type	Binary-Value	No	Object Type
Present Value	Inactive	No	Binary
Status Flags	{0,0,0,0}	No	Status Flags
Event State	Normal	No	Event State
Reliability	No Fault Detected	No	Reliability
Out of Service	FALSE	Yes	Boolean
Units	--per specification--	No	Engineering Units

Property	Default Value	Is (User) Writable	Data Type
Object Identifier	BV7	No	Object Identifier
Object Name	"Alarm Low Limit Enable"	No	Character String
Object Type	Binary-Value	No	Object Type
Present Value	Inactive	No	Binary
Status Flags	{0,0,0,0}	No	Status Flags
Event State	Normal	No	Event State
Reliability	No Fault Detected	No	Reliability
Out of Service	FALSE	Yes	Boolean
Units	--per specification--	No	Engineering Units

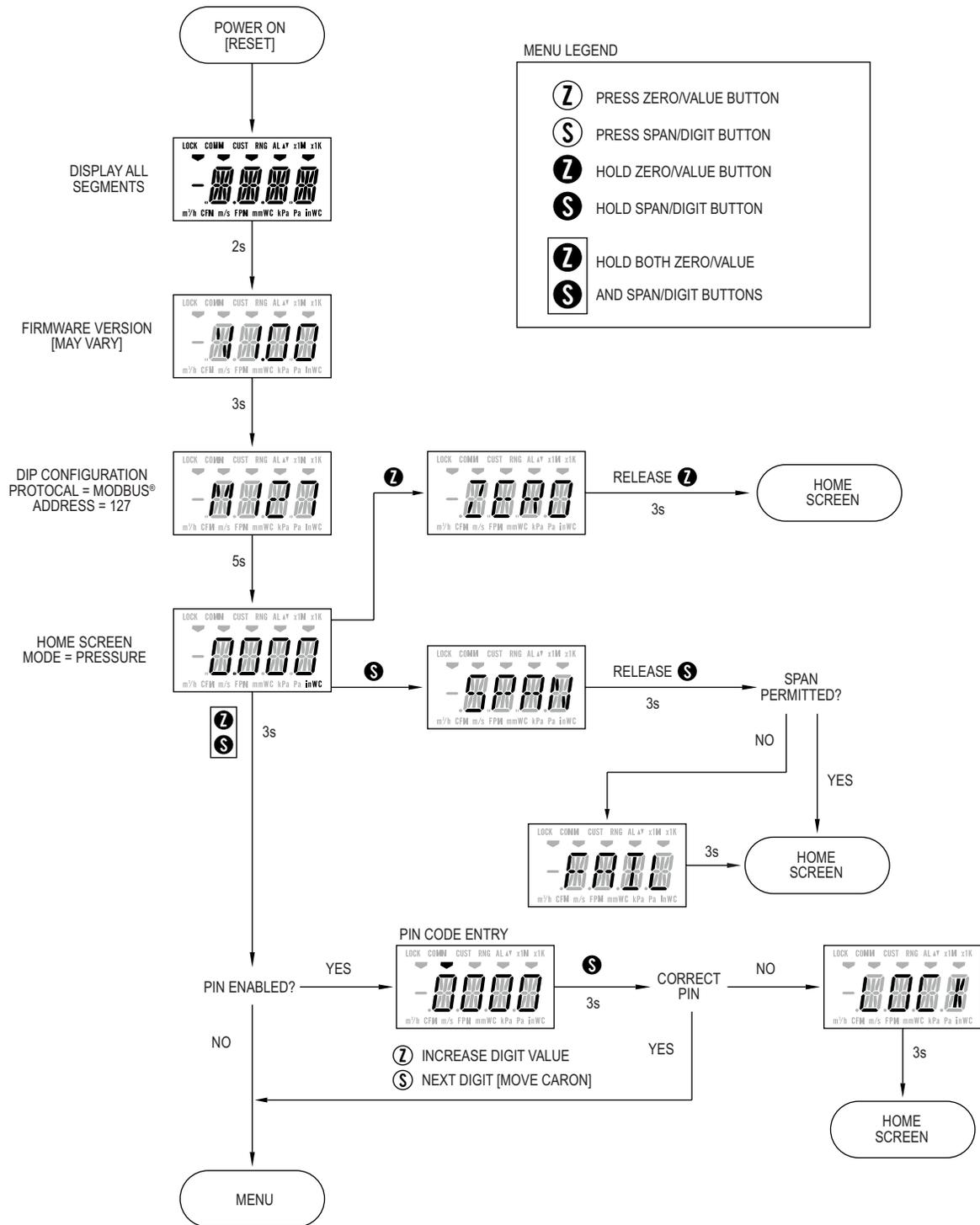
Property	Default Value	Is (User) Writable	Data Type
Object Identifier	BV8	No	Object Identifier
Object Name	"Alarm Low Limit Status"	No	Character String
Object Type	Binary-Value	No	Object Type
Present Value	Inactive	No	Binary
Status Flags	{0,0,0,0}	No	Status Flags
Event State	Normal	No	Event State
Reliability	No Fault Detected	No	Reliability
Out of Service	FALSE	Yes	Boolean

V: BACNET MULTI-STATE VALUE OBJECTS

Property	Default Value	Is (User) Writable	Data Type
Object Identifier	MSV1	No	Object Identifier
Object Name	"Process Mode"	No	Character String
Object Type	Multi-State Value	No	Object Type
Present Value	1	Yes	Binary
Status Flags	{0,0,0,0}	No	Status Flags
Event State	Normal	No	Event State
Reliability	No Fault Detected	No	Reliability
Out of Service	FALSE	Yes	Boolean
Number of States	3	No	Unsigned
State Text	"Pressure", "Velocity", "Flow"	No	Character String

VI: BACNET POSITIVE INTEGER VALUE OBJECTS

Property	Default Value	Is (User) Writable	Data Type
Object Identifier	PIV1	No	Object Identifier
Object Name	"Damping Time"	No	Character String
Object Type	Positive Integer Value	No	Object Type
Present Value	0	Yes	Binary
Status Flags	{0,0,0,0}	No	Status Flags
Event State	Normal	No	Event State
Reliability	No Fault Detected	No	Reliability
Out of Service	FALSE	Yes	Boolean
Units	seconds	No	Unsigned
Property List	--per specification--	No	Array[N] of Property Identifier
MAX Pres Value	30	No	Real
MIN Pres Value	0	No	Real



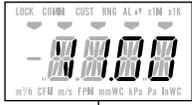
POWER ON [RESET]

DISPLAY ALL SEGMENTS



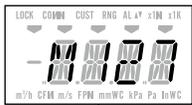
2s

FIRMWARE VERSION [MAY VARY]



3s

DIP CONFIGURATION PROTOCOL = MODBUS® ADDRESS = 127



5s

HOME SCREEN MODE = PRESSURE

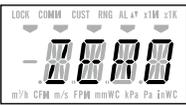


3s

MENU LEGEND

- Z** PRESS ZERO/VALUE BUTTON
- S** PRESS SPAN/DIGIT BUTTON
- Z** HOLD ZERO/VALUE BUTTON
- S** HOLD SPAN/DIGIT BUTTON
- Z** HOLD BOTH ZERO/VALUE AND SPAN/DIGIT BUTTONS

Z

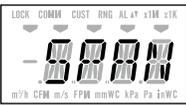


RELEASE **Z**

3s

HOME SCREEN

S



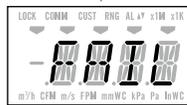
RELEASE **S**

3s

SPAN PERMITTED?

NO

YES

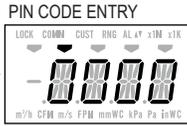


3s

HOME SCREEN

PIN ENABLED?

YES

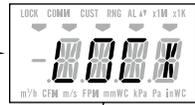


S

3s

CORRECT PIN

NO



3s

HOME SCREEN

NO

MENU

- Z** INCREASE DIGIT VALUE
- S** NEXT DIGIT [MOVE CARON]

