

# SE-45 TRUWIDE ULTRASONIC SENSOR USER MANUAL



**SE-45 ULTRASONIC SENSOR**  
(SE-45-52-10 Shown)

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## GENERAL INTRODUCTION

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### DEFINITION OF TERMS

1. **Controller/Processor** – The electronics processing unit that controls and drives the actuators that are attached to it, in response to position feedback from the sensors.
2. **MAC Address** – (**Media Access Control**). This is the factory assigned hardware address of a SE-45 Sensor. MAC Address is also referred to as MAC-ID.
3. **MAXNET** – This is the Fife proprietary serial protocol that is used for communications between SE-45 Sensors and D-MAX devices. This is a deterministic protocol. Therefore, the MAXNET network must be isolated from other Ethernet networks that do not follow this protocol.
4. **Polarity** – The direction of movement in response to a command or error signal.
5. **Strip/Web** – The user's material that is being guided.
6. **Virtual Sensor** – This is a term adopted to describe the way the SE-45 Sensor handles web edges. A virtual sensor simply defines a range within the sensor field of view which represents the signal scaling to be applied to the edge tracked within the defined range. Each virtual sensor is also polarity-aware so that it only tracks the edge with the configured polarity. Virtual sensor sizes can be the entire field of view or can be as small as 10.2mm (0.4in), and since they are just mathematical ranges, they can overlap in any conceivable manner.



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### SE-45 TRUWIDE ULTRASONIC SENSOR GENERAL INFORMATION

The instructions contained in this User Manual are written to support operation of the SE-45 TruWide Ultrasonic Sensor. Additionally, where applicable, instructions are included for communications with Fife Controllers/Processors, such as the Fife D-MAX Web Guide Controller. These instructions are to be used in addition to those instructions provided with the Controller/Processor.

The SE-45 TruWide Ultrasonic Sensor is another Fife advancement in technology that provides superior guiding performance. It provides analog outputs for backward compatibility, and also an Ethernet digital interface for advanced functions.

The SE-45 TruWide Ultrasonic Sensor may be used in conjunction with the Fife Controllers/Processors as a guiding system. If the Sensor is connected to a D-MAX Operator Interface via an Ethernet connection, multiple menus are available for configuring the Sensor. It may also be used "Stand-Alone" for Web Width monitoring or Edge Position monitoring.

The SE-45 TruWide Ultrasonic Sensor can be mounted either to a square bar using the optional mounting brackets, or by utilizing the incorporated mounting holes near the far corners of the sensor housing.

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### CAUTIONS AND WARNINGS

#### CAUTION:

When using an Ethernet Connection with the SE-45 Sensor, if DHCP is set to ON and the DHCP Server is not connected or operating at the time the SE-45 Sensor is powered-up, after 30 seconds the SE-45 Sensor adopts the currently stored IP-Address so that the system can initialize. Once the DHCP Server is connected and operating properly, all D-MAX devices configured for DHCP must be power-cycled to allow the DHCP Server to assign a new IP-Address.

#### WARNING:

The SE-45 Sensor may be remotely controlled via a network connection. As with any network-controlled device, when remote control of the device is implemented, there is the possibility of movement of the guiding structure when remote commands are issued. Therefore, any time personnel are near the guiding structure, it is recommended that standard safeguards be taken to prevent injury. During servicing of the equipment, to prevent injury to personnel, it is recommended that standard Lockout/Tagout procedures be used.

## GETTING STARTED

### CONNECTIONS, SE-45 SENSOR



**X1 – ETHERNET**  
ETHERNET NETWORK CONNECTION.

**X2 – AUXILIARY**  
AUXILIARY POWER (+10.5 TO +51 VDC).  
ANALOG OUTPUT (WEB WIDTH).

**X3 – OUTPUT**  
CONNECTION TO CONTROLLER (DEFAULT).  
POWER INPUT (+10.5 TO +13.2 VDC).  
ANALOG OUTPUTS (EDGE1, EDGE2, WEB WIDTH).

### POWER CONNECTION

Power to the SE-45 TruWide Sensor should be supplied to either the X2 or X3 Connector, but not to both connectors.

1. When used as a 'stand-alone' sensor, power should be applied to the X2 Connector. Follow the voltage guidelines shown above.
2. When used as part of a Fife system, the Controller/Processor generally supplies power to the X3 Connector. If alternate power is to be supplied, refer to the System Drawings for information on power supply requirements. Verify the supply is within the above listed limits.



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## NETWORK CONNECTION

Optional Network Communication Settings in the SE-45 TruWide Sensor;

1. The IP Address of each Ethernet Device in a network must be unique to each Device in the network. All SE-45 Sensors are shipped from the factory with the same IP Address (10.0.0.150). If it is necessary to change the IP Address of the SE-45 Sensor, see "Network" in the "Menus" section of this User Manual for setting the IP Address of the Sensor.
2. MAXNET is Fife's proprietary protocol used to communicate between the SE-45 Sensor and other network devices, such as the Fife D-MAX Controller and D-MAX Operator Interface.
3. The MAXNET Address of each Ethernet Device in a network must be unique (Address 1-31). The address must not be 0 (zero). If the optional Ethernet connection is being used on the SE-45 Sensor, see "Network" in the "Menus" section of this User Manual for setting the MAXNET Address of the Sensor.



## SENSOR OPERATION

### SE-45 BASIC OPERATION

The SE-45 TruWide Ultrasonic Sensor utilizes scanning technology to detect on-web and off-web transition edges of web material that is located within the sensor's field of view. This allows new edges to be detected at any time. The scanning orientation is from the closed end of the sensor to the open end of the sensor. The position of the detected edges in relation to either the sensor's default Proportional Band or the user configured Proportional Band is then applied to the output signals of the sensor. Both analog and digital output signals are provided. The following sections describe the default and optional settings for available sensor parameters.

**WARNING:** Before changing any of the sensor's parameters, verify that the Controller that is using this sensor as a signal source is in either Manual Mode or Servo Center Mode. Otherwise, there is the possibility of movement of the guiding structure. Therefore, any time personnel are near the guiding structure, it is recommended that standard safeguards be taken to prevent injury. During servicing of the equipment, to prevent injury to personnel, it is recommended that standard Lockout/Tagout procedures be used.

### Analog Outputs

There are four configurable Analog Outputs, controlled by three configurable signal sources. The Analog Outputs can be independently configured to produce any combination of the following signal ranges. The Analog Output mapping may be configured for each of the sensor's Jobs. An Ethernet connection to the sensor is required for configuration changes.

- 0-10mA (default)
- 0-20mA
- 4-20mA
- OFF

Two of the four Analog Outputs, by default, provide edge position (the first on-web edge and the first off-web edge detected in the scan direction). The other two outputs, by default, provide web width measurement and are common to each other in function, but are located on two separate connectors for accessibility in various applications. The function assigned to the Analog Outputs is configurable. Any signal produced by the SE-45 can be mapped to the Analog Outputs up to and including duplicating the same signal on all outputs, if desired. See "SE-45 WEB PAGE" for more information on the available signals. An Ethernet connection to the sensor is required for configuration changes. The default mode maps the Analog Channels as follows:

- Analog Channel 0 (Analog Output 1) =  $VS_1$  (Virtual Sensor 1)
- Analog Channel 1 (Analog Output 2) =  $VS_2$  (Virtual Sensor 2)
- Analog Channel 2 (Analog Outputs 3 & 4) =  $WW_1$  (web width)

### Digital Outputs

The Digital Outputs are transmitted via a proprietary Fife Maxnet Serial Protocol over Ethernet, which requires an optional Ethernet cable connected to a network device. See "SE-45 WEB PAGE" for more information on the available signals.

### Sensor Jobs

The SE-45 supports storage for up to 8 different Jobs. A Job contains the sensor operation mode (Single or Multiple Proportional Bands), the Proportional Band size, and all learned Virtual Sensor

parameters. Recalling a Job immediately activates the position and proportional bands for all Virtual Sensors. The sensor default has only a single Job enabled and is configured as a Single Proportional Band, which is described below. In order to use more than one Job it must first be enabled in the “Job Enable” menu. Jobs are selected in the “Select Job” menu.

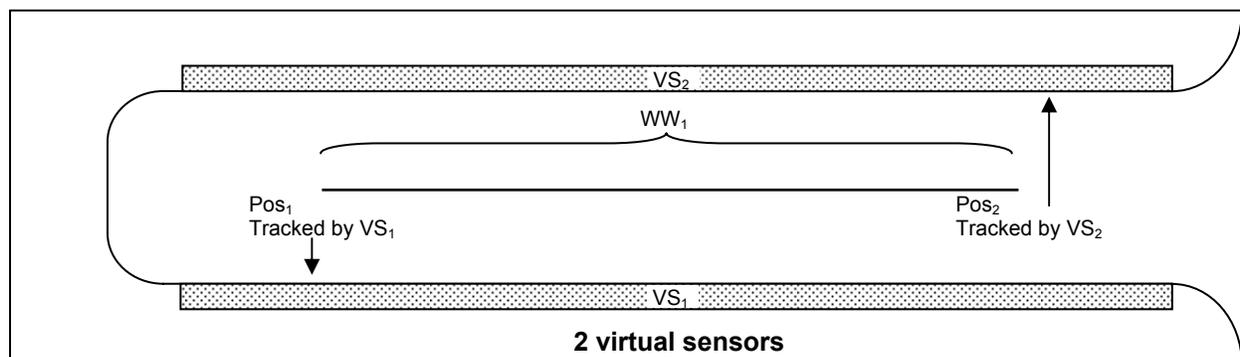
## OPERATION MODES

The SE-45 Sensor may be operated in either of two operation modes: Single Proportional Band or Multiple Proportional Band. The default operation mode is Single Proportional Band. The Single Proportional Band mode is used to detect 1 or 2 web edges. In this mode, the full sensor bandwidth (field of view) is utilized for detection of the web edges. See “SE-45 Single Proportional Band Mode Of Operation” for more details on this operation mode.

The optional Multiple Proportional Band mode supports up to 8 webs (16 edges). This operation mode requires an optional Ethernet cable connected to a network device such as a D-MAX Operator Interface. Sensor parameters must be configured before using this operation mode. See “SE-45 Multiple Proportional Band Mode Of Operation” for more details on this operation mode.

### SE-45 Single Proportional Band Mode Of Operation

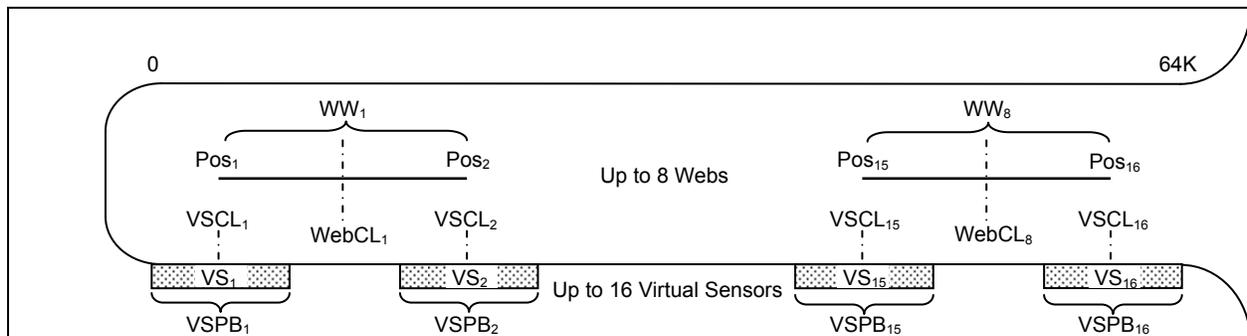
The default Single Proportional Band operation mode of the SE-45 TruWide Ultrasonic Sensor is used for guiding and web width monitoring of a single web. In this mode, two overlapping Virtual Sensors that span the entire field of view of the sensor, are utilized. The Virtual Sensor 1 (VS1) signal represents the first on-web transition found (the web edge closest to the closed end of the sensor) and the Virtual Sensor 2 (VS2) signal represents the first off-web transition (the web edge toward the open end of the sensor). This is generally used to guide to the center of the web by monitoring the position of both edges of the web. If additional web edges are present in the sensor’s field of view, they are detected by the sensor, but they are not normally used. Therefore, Virtual Sensors VS3 thru VS16 are not normally used in this mode. This mode can also be used to detect only the first on-web transition found, as would be the case when a web extends beyond the open end of the sensor. The following graphic illustrates the general nature of this mode of operation, when both edges of a web are present in the sensor’s field of view. (This graphic is not intended to be an accurate representation of the physical properties of the sensor).



If it is desired to monitor the position or width of more than one web, Multiple Proportional Band mode should be used.

### SE-45 Multiple Proportional Band Mode Of Operation

The Multiple Proportional Band operation mode of the SE-45 TruWide Ultrasonic Sensor requires an Ethernet connection to a network device, such as a PC or a Fife D-MAX Operator Interface for configuration of the sensor. In this mode, the SE-45 Sensor can provide up to 16 Virtual Sensors that can be located anywhere in the sensor's field of view. This mode enables additional menu-controlled features, including **Edge Learning**, **Proportional Band Size**, and **Virtual Sensor Linking**. Also, jogging or shifting of the Virtual Sensors is available in this operation mode. (See "Jog Virtual Sensors" under "Specific Procedures", later in this User Manual). The sensor can track up to 8 webs (16 edges). All signals are available via Maxnet, or any three signals can be mapped to the SE-45 Analog Outputs. The following graphic illustrates the general nature of this mode of operation. (This graphic is not intended to be an accurate representation of the physical properties of the sensor).



### Edge Learning

Edge Learning, which is required when using the Multiple Proportional Band mode, provides a method to automatically build Virtual Sensor(s) based on the position of webs which are placed in the sensor's field of view. When initiated, Edge Learning configures a Virtual Sensor of the specified Proportional Band size and proper polarity for each edge found within the sensor's field of view, at the moment it is initiated. The center of each Virtual Sensor is located at the respective web edge position. If, during the learning process, an edge is too close to either end of the sensor's field of view to keep the Virtual Sensor centered on the edge, the Virtual Sensor will be shifted to the field of view limit and will preserve the configured Proportional Band size. The number of Virtual Sensors built depends on the number of web edges detected. See "Learn Edges" in the "Job Settings" menu structure in the "MENUS" section of this User Manual.

### Proportional Band Size

The size of the Virtual Sensors may be changed if the Multiple Proportional Band mode is being used. Changes in this parameter are applied to all Virtual Sensors, and takes effect immediately. The minimum size of the Virtual Sensors is 10.2 mm [0.402 inches]. The maximum size of the Virtual Sensors is equal to the full sensor field of view. See "Proportional Band Size" in the "Job Settings" menu structure in the "MENUS" section of this User Manual.

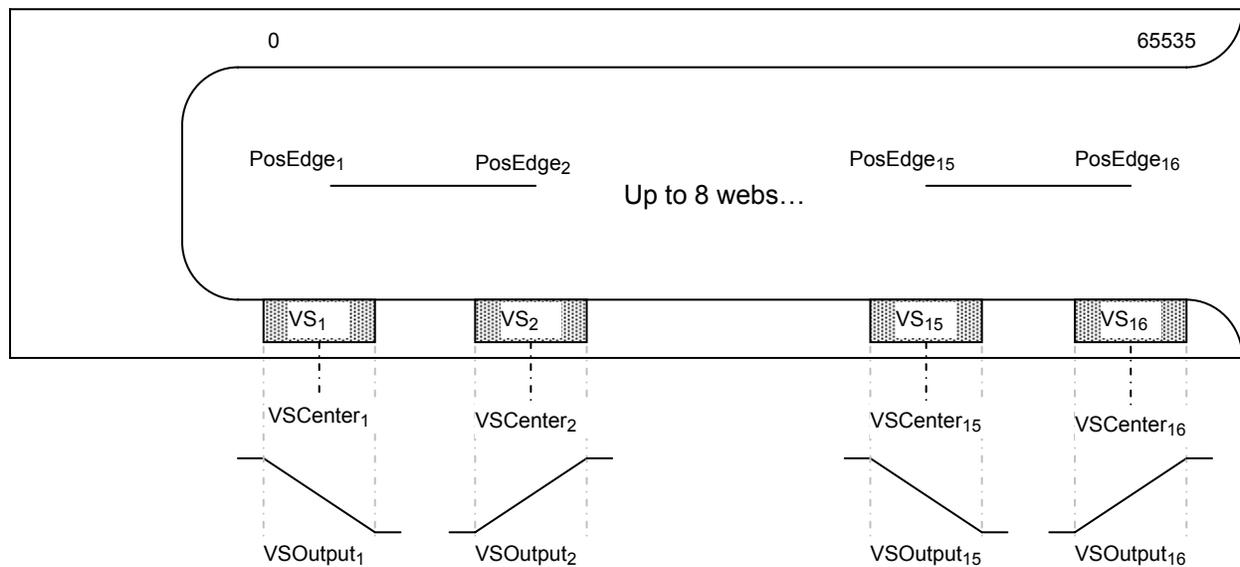
### Virtual Sensor Linking

Virtual Sensor Linking provides a method to link the position of two or more Virtual Sensors together. Then, if one of the Virtual Sensors is shifted, all of the Virtual Sensors that are linked to that Virtual Sensor will follow it as it shifts. See "Sensor Linking" in the "Job Settings" menu structure in the "MENUS" section of this User Manual.

## MODBUS/TCP INTERFACE

The SE-45 Tru-Wide™ Sensor provides Modbus/TCP slave capability. (An optional Ethernet cable is required for communication between the sensor and a network device). The default settings permit the collection of lateral position information for up to 8 webs (16 edges). The default SE-45 configuration also supports remote control commands for Virtual Sensor operations such as learning edge positions and shifting Virtual Sensors individually or in groups.

### Default Signals



PosEdge<sub>n</sub> = Edge position relative to the complete sensor field of view. (0-65535).

VSCenter<sub>n</sub> = Virtual Sensor center position relative to complete sensor field of view. (0-65535).

VSOOutput<sub>n</sub> = Virtual Sensor output based on edge position within the virtual sensor field of view. (±32767).



**Default Data**

The default data available from SE-45 Modbus slave is as follows:

SE-45 to Customer (57 words)		
Register	Parameter	Description
0	Reserved	Reserved.
1	RemReqCmd	Remote control command. (See remote control)
2	RemReqStatus	Remote control status. (See remote control)
3	RemReqParam1	Remote control parameter. (See remote control)
4	Transducer Count	Number of transducers in sensor.
5	Job Number	Current active job number (1-8)
6	Edge Count	Number of edges present.
7	Web Count	Number of webs present.
8	PB Size	Virtual Sensor proportional band size (0-65535).
9	VSCenter1	Position of Virtual Sensor centers. (0-65534)  Transducer count can be used to provide conversion to desired unit of measurement. Multiply transducer count by 5.1mm to determine complete sensor field of view.
10	VSCenter2	
11	VSCenter3	
12	VSCenter4	
13	VSCenter5	
14	VSCenter6	
15	VSCenter7	
16	VSCenter8	
17	VSCenter9	
18	VSCenter10	
19	VSCenter11	
20	VSCenter12	
21	VSCenter13	
22	VSCenter14	
23	VSCenter15	
24	VSCenter16	
25	VSOutput1	Virtual Sensor outputs. ( $\pm 32767$ )
26	VSOutput2	
27	VSOutput3	
28	VSOutput4	
29	VSOutput5	
30	VSOutput6	
31	VSOutput7	
32	VSOutput8	
33	VSOutput9	
34	VSOutput10	
35	VSOutput11	
36	VSOutput12	
37	VSOutput13	
38	VSOutput14	
39	VSOutput15	
40	VSOutput16	
41	PositionEdge1	Position of sensed edges. (0-65534)  Transducer count can be used to provide conversion to desired unit of measurement. Multiply transducer count by 5.1mm to determine complete sensor field of view.
42	PositionEdge2	
43	PositionEdge3	
44	PositionEdge4	
45	PositionEdge5	
46	PositionEdge6	
47	PositionEdge7	
48	PositionEdge8	
49	PositionEdge9	
50	PositionEdge10	
51	PositionEdge11	
52	PositionEdge12	
53	PositionEdge13	
54	PositionEdge14	
55	PositionEdge15	
56	PositionEdge16	





<b>Cancel</b>	<b>0x1000</b>	Cancel any pending operation. This command can also be used to “ping” the sensor to verify its presence.														
<b>Command Syntax:</b>																
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	
<b>CMD</b>				SPD	LNK	UNIT		JOB				VS				
1				0		0		0				0				
Parameter1    Not used.			Parameter2    Not used.			Parameter3    Not used.										
<b>Response:</b>																
RemReqCmd        Duplicates the supplied command.																
RemReqStatus    1 = Command completed.																
RemReqParam1    Not used.																

<b>Select Job</b>	<b>0x20x0</b>	Select a new job.														
<b>Command Syntax:</b>																
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	
<b>CMD</b>				SPD	LNK	UNIT		JOB				VS				
2				0		X		0				0				
Parameter1    Not used			Parameter2    Not used			Parameter3    Not used										
<b>JOB</b>			New job number 1 through 8. The requested job number must have been previously enabled or the command fails.													
<b>Response:</b>																
RemReqCmd        Duplicates the supplied command.																
RemReqStatus    1 = Command completed.																
RemReqParam1    -2 = Invalid job.																
RemReqParam1    Not used.																



<b>Move VS Absolute</b>	<b>0x4xxx</b>	Move virtual sensor to an absolute position.													
<b>Command Syntax:</b>															
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
<b>CMD</b>				<b>SPD</b>	<b>LNK</b>	<b>UNIT</b>		<b>JOB</b>				<b>VS</b>			
4				X		X		X				X			
<b>Parameter1</b>	Required	Positive value indicating the desired virtual sensor position. It is interpreted according to the UNIT field described below.													
<b>Parameter2<sub>1</sub></b>	Optional	Parameter used when LNK = 1 to move one or more virtual sensors when the target virtual sensor moves.													
<b>Parameter3<sub>1</sub></b>	Optional	Parameter used when SPD = 1 to control the shift speed. This parameter is interpreted as specified by the UNIT field.													
<b>VS</b>	Specifies the target virtual sensor to move. (0x0=VS1; 0xF=VS16).														
<b>JOB</b>	Job number to apply the virtual sensor(s) relocation. A job number of 0 will apply the move to the currently active job, but a value from 1 to 8 can be supplied to move the virtual sensors of other jobs prior to selecting them.														
<b>UNIT</b>	The UNIT field specifies the measurement units used to interpret the supplied virtual sensor location in Parameter1. This setting also specified how the optional shift speed is interpreted (mm/sec x 10 or inches/sec x 1000). <ul style="list-style-type: none"> <li>• <b>00</b> = All parameters are interpreted using 0 to 65534 scaling. The optional shift speed is treated as mm/sec x 10.</li> <li>• <b>01</b> = Parameters are interpreted as mm x 10. Optional shift speed is interpreted as mm/sec x 10.</li> <li>• <b>10</b> = Parameters are interpreted as inches x 1000. Optional shift speed is interpreted as inches/sec x 1000.</li> <li>• <b>11</b> = Reserved, handled same as 00.</li> </ul>														
<b>SPD<sub>1</sub></b>	The SPD bit specifies the use of a shift speed parameter supplied in Parameter3. <ul style="list-style-type: none"> <li>• 1 = Use Parameter3 to specify the shift speed.</li> <li>• 0 = Move the sensor(s) immediately to the specified location.</li> </ul> The shift speed in Parameter3 is interpreted according to the UNIT field.														
<b>LNK<sub>1</sub></b>	The LNK bit specifies if one or more virtual sensors should be linked to the target virtual sensor specified in the VS field. This allows multiple sensors to be moved concurrently relative to the target sensor. <ul style="list-style-type: none"> <li>• 1 = Use the mask in Parameter2 to link one or more sensors.</li> <li>• 0 = Parameter2 is not used.</li> </ul>														
<b>Parameter2 mask:</b> (set the target virtual sensor bit and any additional bits to link multiple virtual sensors)															
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
VS16	VS15	VS14	VS13	VS12	VS11	VS10	VS9	VS8	VS7	VS6	VS5	VS4	VS3	VS2	VS1
<b>Response:</b>															
RemReqCmd	Duplicates the supplied command.														
RemReqStatus	1 = Command completed. 2 = Command is in progress (shifting). Negative value indicates an error (see RemReqStatus values described previously).														
RemReqParam1	Not used.														

**Note 1** – The SPD and LNK options should only be used when the JOB field is 0, as they would have no effect when shifting any job other than the currently active job.



<b>Move VS Relative</b>	<b>0x5xxx</b>	Move virtual sensor relative to its current position.																																																
<b>Command Syntax:</b>																																																		
<table border="1" style="width: 100%; border-collapse: collapse; font-size: small;"> <tr> <td style="width: 5%;">15</td><td style="width: 5%;">14</td><td style="width: 5%;">13</td><td style="width: 5%;">12</td><td style="width: 5%;">11</td><td style="width: 5%;">10</td><td style="width: 5%;">9</td><td style="width: 5%;">8</td><td style="width: 5%;">7</td><td style="width: 5%;">6</td><td style="width: 5%;">5</td><td style="width: 5%;">4</td><td style="width: 5%;">3</td><td style="width: 5%;">2</td><td style="width: 5%;">1</td><td style="width: 5%;">0</td> </tr> <tr> <td colspan="4" style="text-align: center;">CMD</td><td style="text-align: center;">SPD</td><td style="text-align: center;">LNK</td><td colspan="3" style="text-align: center;">UNIT</td><td colspan="4" style="text-align: center;">JOB</td><td colspan="4" style="text-align: center;">VS</td> </tr> <tr> <td colspan="4" style="text-align: center;">5</td><td colspan="3" style="text-align: center;">X</td><td colspan="4" style="text-align: center;">X</td><td colspan="4" style="text-align: center;">X</td> </tr> </table>	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	CMD				SPD	LNK	UNIT			JOB				VS				5				X			X				X					
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0																																			
CMD				SPD	LNK	UNIT			JOB				VS																																					
5				X			X				X																																							
<b>Parameter1</b>	Required	Signed value indicating the desired distance and direction to move the specified virtual sensor. It is interpreted according to the UNIT field described below.																																																
<b>Parameter2<sub>1</sub></b>	Optional	Parameter used when LNK = 1 to move one or more virtual sensors when the target virtual sensor moves.																																																
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<b>JOB</b>	Job number to apply the virtual sensor(s) relocation. A job number of 0 will apply the move to the currently active job, but a value from 1 to 8 can be supplied to move the virtual sensors of other jobs prior to selecting them.																																																	
<b>UNIT</b>	<p>The UNIT field specifies the measurement units used to interpret the supplied virtual sensor location in Parameter1. This setting also specified how the optional shift speed is interpreted (mm/sec x 10 or inches/sec x1000).</p> <ul style="list-style-type: none"> <li>• <b>00</b> = All parameters are interpreted using 0 to 65534 scaling. The optional shift speed is treated as mm/sec x 10.</li> <li>• <b>01</b> = Parameters are interpreted as mm x 10. Optional shift speed is interpreted as mm/sec x 10.</li> <li>• <b>10</b> = Parameters are interpreted as inches x 1000. Optional shift speed is interpreted as inches/sec x 1000.</li> <li>• <b>11</b> = Reserved, handled same as 00.</li> </ul>																																																	
<b>SPD<sub>1</sub></b>	<p>The SPD bit specifies the use of a shift speed parameter supplied in Parameter3.</p> <ul style="list-style-type: none"> <li>• 1 = Use Parameter3 to specify the shift speed.</li> <li>• 0 = Move the sensor(s) immediately to the specified location.</li> </ul> <p>The shift speed in Parameter3 is interpreted according to the UNIT field.</p>																																																	
<b>LNK<sub>1</sub></b>	<p>The LNK bit specifies if one or more virtual sensors should be linked to the target virtual sensor specified in the VS field. This allows multiple sensors to be moved concurrently relative to the target sensor.</p> <ul style="list-style-type: none"> <li>• 1 = Use the mask in Parameter2 to link one or more sensors.</li> <li>• 0 = Parameter2 is not used.</li> </ul>																																																	
<b>Parameter2 mask:</b> (set the target virtual sensor bit and any additional bits to link multiple virtual sensors)																																																		
<table border="1" style="width: 100%; border-collapse: collapse; font-size: small;"> <tr> <td style="width: 5%;">15</td><td style="width: 5%;">14</td><td style="width: 5%;">13</td><td style="width: 5%;">12</td><td style="width: 5%;">11</td><td style="width: 5%;">10</td><td style="width: 5%;">9</td><td style="width: 5%;">8</td><td style="width: 5%;">7</td><td style="width: 5%;">6</td><td style="width: 5%;">5</td><td style="width: 5%;">4</td><td style="width: 5%;">3</td><td style="width: 5%;">2</td><td style="width: 5%;">1</td><td style="width: 5%;">0</td> </tr> <tr> <td style="text-align: center;">VS16</td><td style="text-align: center;">VS15</td><td style="text-align: center;">VS14</td><td style="text-align: center;">VS13</td><td style="text-align: center;">VS12</td><td style="text-align: center;">VS11</td><td style="text-align: center;">VS10</td><td style="text-align: center;">VS9</td><td style="text-align: center;">VS8</td><td style="text-align: center;">VS7</td><td style="text-align: center;">VS6</td><td style="text-align: center;">VS5</td><td style="text-align: center;">VS4</td><td style="text-align: center;">VS3</td><td style="text-align: center;">VS2</td><td style="text-align: center;">VS1</td> </tr> </table>	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	VS16	VS15	VS14	VS13	VS12	VS11	VS10	VS9	VS8	VS7	VS6	VS5	VS4	VS3	VS2	VS1																		
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0																																			
VS16	VS15	VS14	VS13	VS12	VS11	VS10	VS9	VS8	VS7	VS6	VS5	VS4	VS3	VS2	VS1																																			
<b>Response:</b>																																																		
RemReqCmd	Duplicates the supplied command.																																																	
RemReqStatus	<p>1 = Command completed.                  2 = Command is in progress (shifting).                  Negative value indicates an error (see RemReqStatus values described previously).</p>																																																	
RemReqParam1	Not used.																																																	

**Note 1** – The SPD and LNK options should only be used when the JOB field is 0, as they would have no effect when shifting any job other than the currently active job.



<b>Learn Edges</b>	<b>0x6000</b>	Build a virtual sensor centered on each edge located in the sensor. The virtual sensor numbers are assigned sequentially from the closed end of the sensor to the open end.													
<b>Command Syntax:</b>															
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
<b>CMD</b>				SPD	LNK	UNIT		JOB				VS			
6				0			0				0				
Parameter1			Not used												
Parameter2			Not used												
Parameter3			Not used												
<b>Response:</b>															
RemReqCmd			Duplicates the supplied command.												
RemReqStatus			1 = Command completed.												
RemReqParam1			Number of virtual sensors built.												

<b>Set PB Size</b>	<b>0x9xx0</b>	Set the virtual sensor proportional band size.													
<b>Command Syntax:</b>															
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
<b>CMD</b>				SPD	LNK	UNIT		JOB				VS			
9				X			X				0				
Parameter1			Required	Specifies the new virtual sensor proportional band size. All virtual sensors in the selected job will use the specified size.											
Parameter2			Not used												
Parameter3			Not used												
<b>JOB</b>			Job number to set proportional band. A job number of 0 will change the proportional band size of the currently active job. A value from 1 to 8 can be supplied to change the proportional band size of other jobs prior to selecting them.												
<b>UNIT</b>			The UNIT field specifies the measurement units used to interpret the supplied virtual sensor proportional band size in Parameter1.												
			<ul style="list-style-type: none"> <li>• <b>00</b> = Size in Parameter1 is scaled from 0 to 65534 (complete field of view).</li> <li>• <b>01</b> = Size in Parameter1 is interpreted as mm x 10.</li> <li>• <b>10</b> = Size in Parameter1 is interpreted as inches x 1000.</li> <li>• <b>11</b> = Reserved, handled same as 00.</li> </ul>												
<b>Response:</b>															
RemReqCmd			Duplicates the supplied command.												
RemReqStatus			1 = Command completed. -2 = Invalid job. -5 = Invalid parameter.												
RemReqParam1			Not used.												



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### SE-45 WEB PAGE

The SE-45 TruWide Ultrasonic Sensor contains an integrated HTTP server that provides web page access to the sensor's configuration parameters. This requires an optional Ethernet cable connected to a network device such as a PC, which contains a Web Browser. To communicate with the SE-45 Sensor, the PC and the Web Browser must be configured to match the SE-45 Sensor's network settings. The default network settings for the SE-45 Sensor's web page are as follows. (Once communications has been established, these settings may be changed, if desired).

IP Address – 10.0.0.150  
Subnet Mask – 255.0.0.0  
Gateway – 10.0.0.1  
DHCP – Off

The SE-45 Sensor's web page uses tabs to navigate between features. The tabs and their contents are as follows.

**Home** – This tab is displayed when communication is first established with the SE-45 Sensor. It contains an image of the SE-45 TruWide Ultrasonic Sensor.

**Info** – This tab contains information about the sensor, such as Serial Number, Network Settings, Firmware and Software versions, Proportional Band size (including the number of transducer pairs that make up the Proportional Band) and other info related to the configuration of the sensor. The values displayed on this tab cannot be edited.

**Network** – This tab contains Network Settings that may be edited. To change any of the settings located on this tab, enter the desired value in the proper field and then click on the "Apply Changes" button. The changes are sent to the sensor, but not yet effective. It is necessary to cycle the power to the sensor for these changes to take effect. The Network Settings are as follows.

IP address  
Subnet Mask  
Gateway  
DHCP  
MaxNet ID  
MaxNet Cycle Time

The MaxNet ID is important only if the sensor is communicating with another Fife network device incorporating the MaxNet protocol, such as a D-MAX Controller or Operator Interface. The MaxNet Cycle Time should remain the default, unless a change is necessary to reduce network traffic.

**Analog Out** – This tab contains fields that apply to the Analog Outputs. These fields may be edited, as desired. After entering the desired value in the proper field, click on the "Apply Changes" button. The changes are effective immediately. There are four configurable Analog Outputs, controlled by three configurable signal sources. The Analog Channels can be independently configured for each Job that is enabled. The Analog Channels are as follows.

Analog Channel 1 (Connector X3, pin 8)  
Analog Channel 2 (Connector X3, pin 5)  
Analog Channel 3 (Connector X3, pin 7 & Connector X2, pin #4)

The parameters of the Analog Channels that can be edited, are as follows;

**Signal Source** – The source of the signal that controls the Analog Outputs via the Analog Channels. (The source can be configured for each of the three Analog Channels, and for each Job, independently). Analog Channels 1 and 2, by default, provide edge position (the first on-web edge detected and the first off-web edge detected, respectively). Analog Channel 3, by default, provides web width measurement. (Analog Channel 3 controls two Analog Outputs which are located, one each, on connectors X2 and X3, for accessibility in various applications). Any signal produced by the SE-45 Sensor can be mapped to the Analog Channels, up to and including duplicating the same signal on all outputs, if desired. The signal selections are as follows.

VS 1...VS 16 (Virtual Sensors)  
Edge 1...Edge 16 (Edge Positions)  
WebWidth 1...WebWidth 8 (Web Width)

The default mode maps the Analog Channels as follows (VS1 and VS2 are equivalent to Edge 1 and Edge 2 while in Single Proportional Band Mode).

Analog Channel 1 = VS 1 (Virtual Sensor 1)  
Analog Channel 2 = VS 2 (Virtual Sensor 2)  
Analog Channel 3 = WebWidth 1 (Web Width 1)

**Output Type** – The range of the Analog Outputs may be set to any of the following. (The output range can be configured independently for each of the three Analog Channels, and for each Job).

OFF (0mA)  
0-10mA (default)  
0-20mA  
4-20mA

**Polarity** – The polarity of each Analog Output, in relation to the source signal, can be set independently for each output and for each Job. The default Polarity setting for all Analog Outputs is positive (+).

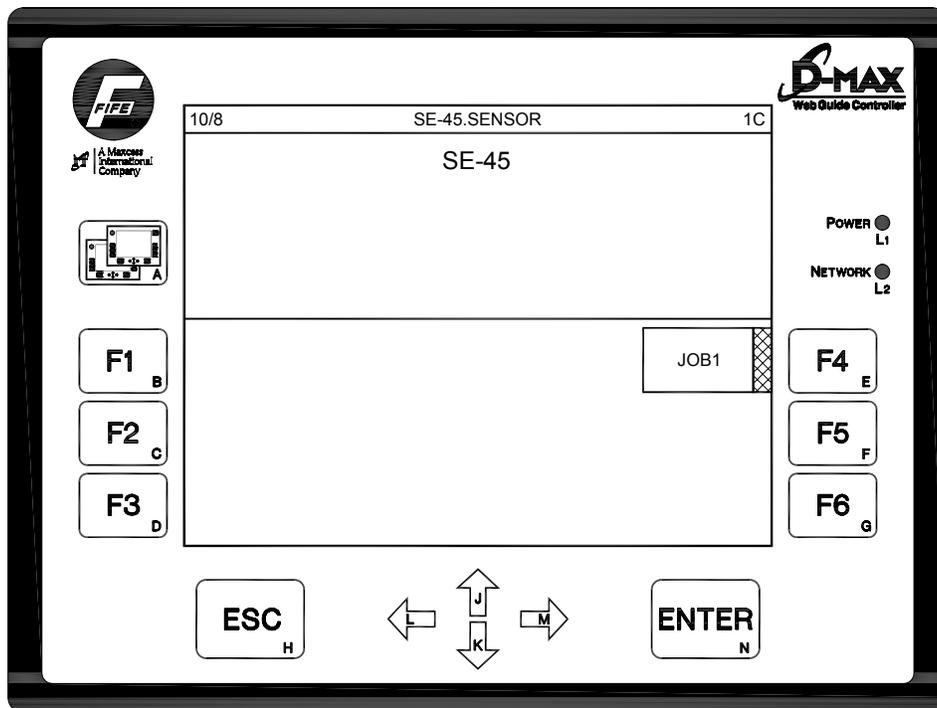
**Calibration** – This tab contains a means to calibrate the sensor to the material being guided. (This Calibration is independent from the “Sensor Calibration” in the Fife Controller/Processor). The SE-45 TruWide Sensor is factory calibrated to an acoustically opaque material. Generally, it is not necessary to recalibrate the sensor. If the material to be guided is not acoustically opaque, it may be possible to improve the performance of the sensor by performing this calibration.

To perform the calibration, click on the “Start Calibration” button, and then follow the on-screen instructions. Once the calibration is complete, the total number of transducers present in the sensor, and Statistics for those transducers, are displayed. (The Statistics are for evaluation purposes, only, and do not reflect the overall performance of the sensor). If it is desired to restore the factory calibration values, click on the “Restore Factory Calibration” button.

## OPERATOR INTERFACE

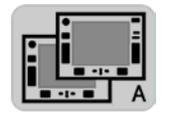
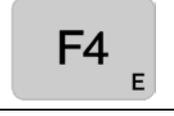
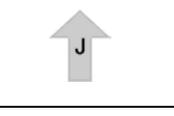
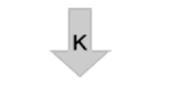
Note: The information and procedures in this section assume the use of an optional Ethernet cable, connecting the SE-45 TruWide Ultrasonic Sensor to a D-MAX Operator Interface.

### SE-45 HOME SCREEN



(Device Home Screen Shown)

KEY DEFINITIONS

	<p><b>A. Screen Select Key.</b> This key is used to scroll through the devices that exist on the network. If the key is held for at least two seconds, a list of the devices is displayed.</p>
	<p><b>B. F1 Key.</b> This key is not used by the SE-45 Wideband Ultrasonic Sensor.</p>
	<p><b>C. F2 Key.</b> This key is not used by the SE-45 Wideband Ultrasonic Sensor.</p>
	<p><b>D. F3 Key.</b> This key is not used by the SE-45 Wideband Ultrasonic Sensor.</p>
	<p><b>E. F4 Key.</b> This key is defined by the graphics located next to it in the display.</p>
	<p><b>F. F5 Key.</b> This key is defined by the graphics located next to it in the display.</p>
	<p><b>G. F6 Key.</b> This key is defined by the graphics located next to it in the display.</p>
	<p><b>H. ESC Key.</b> This key is not used in the Home Screen. In the Menu Levels, this key is used to abort a change or to exit menu levels. Holding the key, or repeated key presses will return to the SE-45 Home Screen.</p>
	<p><b>J. Up Arrow Key.</b> In the Menu Levels, this key is used to scroll up the list of menu entries and also to edit values.</p>
	<p><b>K. Down Arrow Key.</b> In the Menu Levels, this key is used to scroll down the list of menu entries and also to edit values.</p>

	<p><b><u>L</u>. Left Arrow Key.</b> In the Menu Levels, this key is used to enable/disable entries in the displayed list and also to move the cursor when editing values.</p>
	<p><b><u>M</u>. Right Arrow Key.</b> In the Menu Levels, this key is used to enable/disable entries in the displayed list and also to move the cursor when editing values.</p>
	<p><b><u>N</u>. Enter Key.</b> In the SE-45 Home Screen, this key is used to enter the Menus for configuring or monitoring the SE-45 Sensor. In the Menu Levels, this key is used to enter a menu or initiate the action that is selected in the displayed list. It is also used to save a change.</p>



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## MENUS

**Note:** The information and procedures in this section assume the use of an optional Ethernet cable, connecting the SE-45 TruWide Sensor to a network device, such as the D-MAX Operator Interface.

### MENU NAVIGATION NOTES

1. If a setting or value change is made in a menu, pressing the ESC key will abort the change, or pressing the ENTER key will store the change.
2. While in any of the menus, pressing the ESC key will switch to the next higher menu level. The top level is the SE-45 Home Screen. If the ESC key is pressed and held, the menu level will continue switching until the SE-45 Home Screen is reached.
3. While in any of the menus, the column of bars located to the left of the list of menu entries indicates the menu level currently selected. The number of columns of bars will match the number of periods contained in the “Status Number” located in the upper-right corner of the display.
4. While in the menus, the selected entry is surrounded by a rectangular box and is also displayed in the information area of the display. If the selected entry can be enabled/disabled, highlighting indicates enabled.
5. In the menu structure, the ‘X’ in the ‘Status #’ varies according to other parameters, such as Job Selection, Mode Selection, etc.

### JOB SETTINGS

To enter the Job Settings Menus, follow the “Job Settings Menu Structure”, shown on the next page. All of these settings are independent for each Job selection. Use the up and down arrow keys to scroll through the list of items in a menu level. Press the ENTER key to advance to the next menu level, or press the ESC key to revert back to the previous menu level. If a change is made, press the ENTER key to save the change or press the ESC key to abort the change. The Job Settings Menus are as follows:

#### Set Sensor Mode

Use this menu to select either Single Proportional Band or Multiple Proportional Band. In Single Proportional Band, the position of each edge is in relation to the full Proportional Band of the sensor. In Multiple Proportional Band, the position of each edge is in relation to the Proportional Band of the Virtual Sensor in which the edge is located. While Multiple proportional Band Mode is selected, the F5 key on the SE-45 Home Screen is labeled ‘Jog’. Pressing this key provides a means to shift the Virtual Sensors, and otherwise manipulate the Virtual Sensors. See “Jogging The Virtual Sensors” at the end of this section.

If Multiple Proportional Band is selected, the **Proportional Band Size** may be set, the position of the web edges may be learned (**Learn Edges**), and the linking of Virtual Sensors (**Sensor Linking**) may be established or revised.

When **Learn Edges** is initiated with one or more web edges in the sensor Field-Of-View, Virtual Sensors are established at the location of each web edge that is detected by the sensor. The center of the Virtual Sensor is aligned with the web edge.



Setting the **Proportional Band Size** establishes the width of the Virtual Sensors. This is a global setting that applies to all Virtual Sensors.

**Sensor Linking** provides a means to link two or more Virtual Sensors together. Then, if one of the Virtual Sensors is shifted, all of the Virtual Sensors that are linked to that Virtual Sensor will follow it as it shifts.

### Job Settings Menu Structure

From the SE-45 Home Screen, press the ENTER key to enter the menus, select "Job Settings", then press ENTER.

Status #					
1X.3	Job Settings				
1X.3.1		Set Sensor Mode			
1X.3.1.1			Single Proportional Band		
1X.3.1.1.1				Use Single Proportional Band	(Press the Enter key to select Single Proportional Band).
1X.3.1.2			Multiple Proportional Band		
1X.3.1.2.1				Proportional Band Size	
1X.3.1.2.1.1					Use the Arrow keys to set the desired value.
1X.3.1.2.2				Learn Edges	(Press the Enter key to learn the position of the current web edges).
1X.3.1.2.3				Sensor Linking	
1X.3.1.2.3.1					Virtual Sensor 1
1X.3.1.2.3.2					Virtual Sensor 2
1X.3.1.2.3.3					Virtual Sensor 3
1X.3.1.2.3.4					Virtual Sensor 4
1X.3.1.2.3.5					Virtual Sensor 5
1X.3.1.2.3.6					Virtual Sensor 6
1X.3.1.2.3.7					Virtual Sensor 7
1X.3.1.2.3.8					Virtual Sensor 8
1X.3.1.2.3.9					Virtual Sensor 9
1X.3.1.2.3.10					Virtual Sensor 10
1X.3.1.2.3.11					Virtual Sensor 11
1X.3.1.2.3.12					Virtual Sensor 12
1X.3.1.2.3.13					Virtual Sensor 13
1X.3.1.2.3.14					Virtual Sensor 14
1X.3.1.2.3.15					Virtual Sensor 15
1X.3.1.2.3.16					Virtual Sensor 16

Use the Up and Down Arrow keys to scroll to the desired entry. Then, use the Left and Right Arrow keys to highlight the desired virtual sensors to be linked, then press the Enter key to save the settings.



**SELECT JOB**

To enter the Select Job Menus, follow the “Select Job Menu Structure”, shown below. These menus may be used to select the desired job. (If the desired job is not listed, see “Job Enable” in the “Control Options” menus). Use the up and down arrow keys to scroll through the list of items in a menu level. Press the ENTER key to advance to the next menu level, or press the ESC key to revert back to the previous menu level. If a change is made, press the ENTER key to save the change or press the ESC key to abort the change. The Job Settings Menus are as follows:

**Select Job Menu Structure**

From the SE-45 Home Screen, press the ENTER key to enter the menus, select "Select Job", then press ENTER.

Status #			
1X.4	Select Job		
1X.4.1		(A) Job1	This list will vary, depending on the Jobs that are enabled. Use the Up and Down Arrow keys to scroll to the desired Job, then press the Enter key to select that Job. (To enable other jobs, go to "Job Enable" under "Control Options").
1X.4.2		(B) Job2	
1X.4.3		(C) Job3	
1X.4.4		(D) Job4	
1X.4.5		(E) Job5	



### HARDWARE SETTINGS

To enter the Hardware Settings Menus, follow the “Hardware Settings Menu Structure”, shown below. These menus may be used to calibrate the SE-45 Sensor. Use the up and down arrow keys to scroll through the list of items in a menu level. Press the ENTER key to advance to the next menu level, or press the ESC key to revert back to the previous menu level. If a change is made, press the ENTER key to save the change or press the ESC key to abort the change. The Job Settings Menus are as follows:

#### Calibrate Transducers

Use this menu to calibrate the transducers. Follow these steps to perform the calibration.

1. **Uncover Transducers.** Remove any blockage from the sensor gap, then press the Enter key to continue. (The no-web signal level will be learned).
2. **Cover Transducers.** Wait for this menu item to be highlighted, then completely block the sensor gap with a sample of the web to be guided, then press the Enter key to continue. (The web opacity will be learned).
3. **Save Settings.** Wait for this menu to be highlighted, then press the Enter key to save the calibration.

#### Hardware Settings Menu Structure

From the SE-45 Home Screen, press the ENTER key to enter the menus, select "Hardware Settings", then press ENTER.

Status #		
1X.5	Hardware Settings	
1X.5.1		Calibrate Transducers
1X.5.1.1		1. Uncover Transducers
1X.5.1.2		2. Cover Transducers
1X.5.1.3		3. Save Settings



### CONTROL OPTIONS

To view or modify any of the following Control Options, follow the “Control Options Menu Structure”, shown below. Use the up and down arrow keys to scroll through the list of items in a menu level. Press the ENTER key to advance to the next menu level, or press the ESC key to revert back to the previous menu level. If a change is made, press the ENTER key to save the change or press the ESC key to abort the change. The Control Options Menus are as follows:

#### Job Enable

Use these menus to enable/disable the desired jobs. Use the up and down arrow keys to select the desired job, then use the left and right arrow keys to enable/disable the selected job. A highlighted selection indicates that selection is enabled. Press Enter to store the change or press ESC to abort the change.

#### Remote Control

Use these menus to enable or disable (ON/OFF) control from remote devices.

#### Length Unit

Use these menus to set the units (mm or inch) that are displayed and used in various menus, if required.

### Control Options Menu Structure

From the SE-45 Home Screen, press the ENTER key to enter the menus, select "Control Options", then press ENTER.

Status #				
1X.6	Control Options			
1X.6.1		Job Enable		
1X.6.1.1			(A) Job1	Use the Up and Down Arrow keys to scroll to the desired Job. Use the Left and Right Arrow keys to highlight the desired Job (enable the job), and then press the ENTER key to store the change. (The contents of this list may vary).
1X.6.1.2			(B) Job2	
1X.6.1.3			(C) Job3	
1X.6.1.4			(D) Job4	
1X.6.1.5			(E) Job5	
1X.6.1.6			(F) Job6	
1X.6.1.7			(G) Job7	
1X.6.1.8			(H) Job8	
1X.6.2		Remote Control		
1X.6.2.1			ON	Use the Up and Down Arrow keys to highlight the desired setting, then press the Enter key to save the setting.
1X.6.2.2			OFF	
1X.6.3		Length Unit		
1X.6.3.1			mm	Use the Up and Down Arrow keys to highlight the desired setting, then press the Enter key to save the setting.
1X.6.3.2			in	



**CONFIGURATION**

To view or modify any of the Configuration Settings, follow the “Configuration Menu Structure”, shown below. Use the up and down arrow keys to scroll through the list of items in a menu level. Press the ENTER key to advance to the next menu level, or press the ESC key to revert back to the previous menu level. If a change is made, press the ENTER key to save the change or press the ESC key to abort the change. The Configuration Menus are as follows:

**Names**

Use these menus to view or modify the Device and Usage names of the selected Controller.

**Serial Number**

The Model Number and Serial Number of the SE-45 Sensor (Device) are displayed.

**FW Number**

The number of the Firmware installed in the SE-45 Sensor (Device) is displayed.

**SW Number**

The number of the Software installed in the SE-45 Sensor (Device) is displayed.

**Distributed System**

Use these menus to view or modify the Application ID and Sub Function. See “Application Filtering” under “Specific Procedures” in this User Manual.

**Configuration Menu Structure**

From the SE-45 Home Screen, press the ENTER key to enter the menus, select "Configuration", then press ENTER.

Status #			
1X.7	Configuration		
1X.7.1		Names	
1X.7.1.1			Device
1X.7.1.1.1			Use the arrow keys to edit, then press Enter to save.
1X.7.1.2			Usage
1X.7.1.2.1			Use the arrow keys to edit, then press Enter to save.
1X.7.2		Serial Number	(The Sensor Serial Numbers are displayed)
1X.7.3		FW Number	(The Sensor Firmware Number is displayed)
1X.7.4		SW Number	(The Sensor Software Number is displayed)
1X.7.5		Distributed System	
1X.7.5.1			Application ID
1X.7.5.1.1			Use the arrow keys to edit, then press Enter to save.
1X.7.5.2			Sub Function
1X.7.5.2.1			Use the arrow keys to edit, then press Enter to save.



**NETWORK**

To view or modify any of the SE-45 Sensor Network Settings, follow the “Network Menu Structure”, shown below. Use the up and down arrow keys to scroll through the list of items in a menu level. Press the ENTER key to advance to the next menu level, or press the ESC key to revert back to the previous menu level. If a change is made, press the ENTER key to save the change or press the ESC key to abort the change. The Network Menus are as follows:

**TCP/IP**

Use these menus to view or edit the Ethernet IP-Address, Subnet Mask, or Gateway. Also, use this menu to enable or disable (ON/OFF) DHCP. **CAUTION:** If DHCP is set to ON and the DHCP Server is not connected or operating at the time the SE-45 Sensor is powered-up, after 30 seconds the SE-45 Sensor adopts the currently stored IP-Address so that the system can initialize. Once the DHCP Server is connected and operating properly, all network devices configured for DHCP must be power-cycled to allow the DHCP Server to assign a new IP-Address.

**MAXNET**

Use these menus to view or edit the MAXNET Address.

**MAC-ID**

Use this menu to view the SE-45 Sensor MAC-ID (Physical Address).

**Network Menu Structure**

From the SE-45 Home Screen, press the ENTER key to enter the menus, select "Network", then press ENTER.

Status #				
1X.8	Network			
1X.8.1		TCP/IP		
1X.8.1.1			IP-Address	
1X.8.1.1.1				Use the arrow keys to edit, then press Enter to save the setting.
XX.8.1.2			Subnet Mask	
1X.8.1.2.1				Use the arrow keys to edit, then press Enter to save the setting.
1X.8.1.3			Gateway	
1X.8.1.3.1				Use the arrow keys to edit, then press Enter to save the setting.
1X.8.1.4			DHCP	
1X.8.1.4.1				ON Use the Arrow keys to highlight the desired setting, then
1X.8.1.4.2				OFF press Enter to save the setting.
1X.8.2		MAXNET		
1X.8.2.1			MAXNET Address	
1X.8.2.1.1				Use the arrow keys to edit.
1X.8.3		MAC-ID	(The sensor MAC-ID is displayed)	



**SERVICE**

To view any of the Service Menus, follow the “Service Menu Structure”, shown below. Use the up and down arrow keys to scroll through the list of items in a menu level. Press the ENTER key to advance to the next menu level. Press the ESC key to revert back to the previous menu level. The Service Menus are as follows:

**MEASURING POINTS**

Use these menus to view the current values of the SE-45 Sensor Output Signals, various power points, internal temperatures, and Network statuses.

**Service Menu Structure**

From the SE-45 Home Screen, press the ENTER key to enter the menus, select "Service", then press ENTER.

Status #					
1X.9	Service				
1X.9.1		Measuring Points			
1X.9.1.1			Signals		
1X.9.1.1.1				Edges	
1X.9.1.1.1.1					Edge 01:XXX.X
1X.9.1.1.1.2					Edge 02:XXX.X
1X.9.1.1.1.3					Edge 03:XXX.X
1X.9.1.1.1.4					Edge 04:XXX.X
1X.9.1.1.2				Virtual Sensors	
1X.9.1.1.2.1					VS 01: XXXXX
1X.9.1.1.2.2					VS 02: XXXXX
1X.9.1.1.2.3					VS 03: XXXXX
1X.9.1.1.2.4					VS 04: XXXXX
1X.9.1.1.3				Web Width	
1X.9.1.1.3.1					WebWidth 01: XXX.X
1X.9.1.1.3.2					WebWidth 02: XXX.X
1X.9.1.1.3.3					WebWidth 03: XXX.X
1X.9.1.1.3.4					WebWidth 04: XXX.X
1X.9.1.1.4				Web Centerline	
1X.9.1.1.4.1					WebCL 01: XXX.X
1X.9.1.1.4.2					WebCL 02: XXX.X
1X.9.1.1.4.3					WebCL 03: XXX.X
1X.9.1.1.4.4					WebCL 04: XXX.X

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1X.9.1.2		Power		
1X.9.1.2.1			Input Voltage	(Input Voltage is displayed).
1X.9.1.2.2			Temperature A [°C]	(Internal Temperature A is displayed).
1X.9.1.2.3			Temperature B [°C]	(Internal Temperature B is displayed).
1X.9.1.2.4			-6V	(-6V Supply value is displayed).
1X.9.1.2.5			+6V	(+6V Supply value is displayed).
1X.9.1.2.6			RCAL	(RCAL value is displayed).
1X.9.1.3		Network		
1X.9.1.3.1			#XX: SE-45 (10.0.0.XXX) (this	This list of Devices detected on the network will vary with the Devices detected.
1X.9.1.3.2			#XX: D-MAX (10.0.0.XXX)	
1X.9.1.3.3			#XX: D-OI (10.0.0.XXX)	



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## SPECIFIC PROCEDURES

### JOG VIRTUAL SENSORS

If “Multiple Proportional Band” is selected in the “Job Settings”, “Set Sensor Mode” menu, then “Jog” will be displayed on the SE-45 Home Screen, adjacent to the “F5” key. This allows the operator to shift the position of selected Virtual Sensors. If multiple Virtual Sensors are “linked”, the linked Virtual Sensors will follow the shifted Virtual Sensor. To enter the “Jog” menus, press the F5 key. A list of the currently available Virtual Sensors is then displayed. The list will vary, depending on the web edges that are currently detected. Use the Up and Down Arrow keys to select the desired Virtual Sensor to be shifted.

- If a relative shift of the selected Virtual Sensor is desired, use the Left and Right Arrow keys to jog the selected Virtual Sensor. The position value will be updated as the Virtual Sensor is shifted. (If any other Virtual Sensors are linked to this Virtual Sensor, those Virtual Sensors will shift, also).
- If an absolute shift of the selected Virtual Sensor is desired, press the Enter key, then use the Left and Right Arrow keys to set the desired position. The Virtual Sensor will move as the value is modified. (If any other Virtual Sensors are linked to this Virtual Sensor, those Virtual Sensors will shift, also). Press the Enter key to save the new position, or press the Esc key to abort the change and return to the previous position.

While in these menus, the following functions are available;

- The F4 key may be used to change the type of number (inch, mm, or decimal) that is displayed, if desired.
- The F5 key may be used to learn new edges, if desired.
- The F6 key may be used to link or unlink specific Virtual Sensors, if desired.

**Note:** The value of “X” in the Status Number is determined by the selected Job (A=Job1, B=Job2, etc.).

From the SE-45 Home Screen, press the F5 key to enter these menus.

Status #		
1X	F5	
1X.1		VS 01: XXXXX
1X.2		VS 02: XXXXX
1X.3		VS 03: XXXXX
1X.4		VS 04: XXXXX

This is a list of the Virtual Sensors. This list will vary, depending on the web edges that are currently detected.



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## **APPLICATION FILTERING**

### **Overview**

If desired, the SE-45 Sensor may be configured so that a D-MAX Operator Interface (OI) will be denied communication with the SE-45 Sensor. (This may be desired so that unauthorized personnel do not have access to the internal settings of the SE-45 Sensor). For further explanation of the Application Filtering, refer to the D-MAX User Manual, Figure Sheet 1-886.

### **Configuring the System for Application Filtering**

To configure the system for Application Filtering, the Application ID number and Sub Function number must be assigned to each SE-45 Sensor from an Operator Interface that has filtering turned off ("All Devices" selected in the OI "Filter Type" menu).

- The Application ID Number (1 thru 31) represents an Application Group of Devices. An Application may be made up of one or more Devices (It may consist of just one SE-45 Sensor). All Devices in an Application Group must have a common Application ID number. Each Application Group must have a unique Application ID number. The Application ID is used to determine the order that the Devices are displayed in the List of Devices on the "All Devices" screen of the Operator Interface.
- The Sub Function Number represents the function of the Device in an Application. The default setting for the Sub Function is 0 (zero). If it is desired to have an Operator Interface communicate with only a specific Device in multiple applications, the Primary Device in each Application that is to be controlled by the Operator Interface must have the Sub Function set to 0 (zero). The Sub Function number for the other Devices on the network must be set to a number other than zero (1-4).

The first step is to configure the Application Filtering parameters of each Device in the network by performing the appropriate following procedure.

1. To configure an SE-45 Sensor, use the following procedure. If desired, refer to "Configuration Menu Structure", in this User Manual.
  - a. From an Operator Interface, select the desired SE-45 Sensor.
  - b. From the SE-45 Home Screen, press the ENTER key to enter the Sensor menus.
  - c. Select "Configuration", and then press the ENTER key.
  - d. Select "Distributed System", and then press the ENTER key.
  - e. Select "Application ID", and then press the ENTER key.
  - f. Use the arrow keys to set the Application ID number (1 thru 31) (0 disables Application Filtering), and then press the ENTER key to store the change. (If other Devices in the network have Application ID numbers assigned, the application will dictate if the Application ID number in this SE-45 Sensor should match, or not match, the number in the other Devices).
  - g. Select "Sub Function", then press the ENTER key.
  - h. Use the arrow keys to set the Sub Function number (0 thru 4), and then press the ENTER key to store the change.
  - i. Press the ESC key until the SE-45 Home Screen is reached.
  - j. Repeat this procedure on other Sensors, as desired.



The next step is to configure the Operator Interface unit/s that will be communicating with the above, configured SE-45 Sensor/s by performing the appropriate following procedure.

1. If it is desired to “hide” the SE-45 Sensor/s so that they do not show up in the List Of Devices on the Operator Interface, perform the following procedure.
  - a. From the Home Screen of the Operator Interface, press and hold the SELECT (A) key for at least 2 seconds to obtain access to the Operator Interface Local Menus, and then press the F6 key to enter the OI Menu.
  - b. In the OI Menu, select “Control Options”, and then press the ENTER key.
  - c. Select “Application Filter”, and then press the ENTER key.
  - d. Select “Filter Type”, and then press the ENTER key.
  - e. Select “Selected Application”, and then press the ENTER key to store the change.
  - f. Next, select “Select Application”, and then press the ENTER key.
  - g. Use the arrow keys to select a number that does NOT match the Application ID that is configured in the SE-45 Sensor/s, and then press the ENTER key to store the new selection. (If other Devices in the network are using the same Application ID number, it may be necessary to select a different number in the SE-45 Sensor).
  - h. Press the ESC key until the Home Screen is reached.
  - i. Repeat this procedure on other Operator Interface units, as desired.
  
2. If the Operator Interface is to communicate with a Primary Device or Devices in all Application Groups, perform the following procedure.
  - a. From the Home Screen of the Operator Interface, press and hold the SELECT (A) key for at least 2 seconds to obtain access to the Operator Interface Local Menus, and then press the F6 key to enter the OI Menu.
  - b. In the OI Menu, select “Control Options”, and then press the ENTER key.
  - c. Select “Application Filter”, and then press the ENTER key.
  - d. Select “Filter Type”, and then press the ENTER key.
  - e. Select “All Applications”, and then press the ENTER key to store the change.
  - f. Press the ESC key until the Home Screen is reached.
  - g. Repeat this procedure on other Operator Interface units, as desired.
  
3. If the Operator Interface is to communicate with all of the Devices in a specific Application Group (Application ID), perform the following procedure.
  - a. From the Home Screen of the Operator Interface, press and hold the SELECT (A) key for at least 2 seconds to obtain access to the Operator Interface Local Menus, and then press the F6 key to enter the OI Menu.
  - b. In the OI Menu, select “Control Options”, and then press the ENTER key.
  - c. Select “Application Filter”, and then press the ENTER key.
  - d. Select “Filter Type”, and then press the ENTER key.
  - e. Select “Selected Application”, and then press the ENTER key to store the change.
  - f. Next, select “Select Application”, and then press the ENTER key.
  - g. Use the arrow keys to set the number to match the Application ID that is desired for this Operator Interface to control, and then press the ENTER key to store the new selection.
  - h. Press the ESC key until the Home Screen is reached.
  - i. Repeat this procedure on other Operator Interface units, as desired.



### Assigning Names For “All Applications” Filtering

If desired, the names of the SE-45 Sensors may be assigned.

1. Once filtering is properly setup and enabled, the items in the List of Devices are formatted as follows: Application ID; Drive Name or Application Name. An example of the entry in the list is “7: Chill”, where 7 is the Application ID Number; and “Chill” is either the SE-45 Sensor Name or the Application Name. The Application ID Number determines the order in the List of Devices.
2. Change the Drive Name of the Primary Device (the Device with its Sub Function set to 0) to the desired name for the Application. This changes the Application Name for all Devices with the same Application ID. (This can be seen in the List of Devices on the “All Devices” screen when filtering is enabled).
3. If desired, the Drive Name of the other drives in that Application may be changed to something that describes their function in the Application. (This step is not necessary when “All Applications” filtering is being used because the Drive Name is not shown in the List of Devices when filtering is enabled).

### Assigning Names For “Selected Applications” Filtering

If desired, the names of the Devices and/or Drives may be assigned.

1. Once filtering is properly setup and enabled, the items in the List of Devices are formatted as follows: Application ID, Sub Function, Application Name, Drive Function (D1, D2, Gateway, etc). An example of the entry in the List of Devices is “5.3: Chill.PT1”, where “5” is the Application ID; “3” is the Sub Function, “Chill” is the Application Name; and “PT1” is the Drive Function. (In the case of the Device with the Sub Function set to 0 (zero), the Sub Function is blank and the Drive Function is blank.
2. If desired, change the Drive Name of the Primary Device (the Device with its Sub Function set to 0) to the desired name for the Application. (Refer to “Names” in the “Configuration” menu, in this User Manual). This changes the Application Name for all Devices with the same Application ID. (This can be seen in the List of Devices on the “All Devices” screen, when filtering is enabled).
3. If desired, change the Drive Name of the other Devices in that Application to something that describes its function in the Application.

**Note:** Sub Function 0 must be assigned to the Primary Device of each application for the Application Name to show up in the List of Filtered Devices. If the Sub Function number of the Primary Device is not 0, “???” will be displayed for the Application Name in the List of Devices.

### Filtered / All (F5) Key

When Application Filtering is properly setup and enabled, this key is available to select the contents of the List of Devices on the “All Devices” screen. From the “Home Screen”, press and hold the Screen Select (A) key for at least 2 seconds. On the “All Devices” screen, the Filtered / All (F5) key may be used to toggle the filtering status between “Filtered” and “All”. When “Filtered” is selected, only the Devices that meet the Application Filtering requirements are displayed in the List of Devices. When “All” is selected, all Devices found on the network are displayed in the List of Devices.

### Disable Application Filtering

If it is desired to disable Application Filtering in an Operator Interface, perform the following procedure.

1. From the Home Screen, press and hold the SELECT (A) key for at least 2 seconds to obtain access to the Operator Interface Local Menus, and then press the F6 key to enter the OI Menus.
2. In the OI Menus, select “Control Options”, and then press the ENTER key.
3. Select “Application Filter”, and then press the ENTER key.
4. Select “Filter Type”, and then press the ENTER key.
5. Select “All Devices”, and then press the ENTER key to store the change.
6. Press the ESC key until the Home Screen is reached.



## SYSTEM NOTES

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1. Disconnect power from the SE-45 Sensor before connecting or disconnecting any cables.
2. All cable connectors must be tightened sufficiently to provide the required connection for the cable shielding.
3. Job selection changes must be performed with the Controller/Processor in either Manual mode or Servo-Center mode, only.

**WARNING:**

The SE-45 Sensor may be remotely controlled via a network connection. As with any network-controlled device, when remote control of the device is implemented, there is the possibility of movement of the guiding structure when remote commands are issued. Therefore, any time personnel are near the guiding structure, it is recommended that standard safeguards be taken to prevent injury. During servicing of the equipment, to prevent injury to personnel, it is recommended that standard Lockout/Tagout procedures be used.



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## MAINTENANCE

The SE-45 TruWide Ultrasonic Sensor requires no scheduled maintenance. When Necessary, clean the surface of the transducers using a clean, water dampened cloth. If necessary, a mild soap solution may be used to dampen the cloth. **DO NOT** use chemical cleaners or solvents when cleaning the transducers, since those materials may cause damage to the transducers.

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## RETURN SHIPMENT INSTRUCTIONS

If it is necessary to return the SE-45 Sensor to Fife Corporation for service, care must be taken to properly package the unit to prevent damage during shipment. If possible, use the original shipping containers.



## SPECIFICATIONS

### GENERAL

- Input Voltage Range, at the X2 Connector**
- 12 - 48 VDC nominal  
10.5 - 51 VDC min/max  
(Customer Supplied Power)
- Input Voltage Range, at the X3 Connector**
- 12 VDC nominal  
10.5 – 13.2 VDC min/max  
(Power Supplied By Fife Controller)
- Power Consumption**
- SE-45-7-10 - 2.4 Watts, max.
  - SE-45-11-10 - 2.5 Watts, max.
  - SE-45-18-10 - 2.6 Watts, max.
  - SE-45-31-10 - 3.0 Watts, max.
  - SE-45-52-10 - 3.6 Watts, max.
- Operating Ambient Temperature**
- 0° to 60°C (32° to 140°F)
- Bandwidth,**
- SE-45-7-10 - 66.2 mm [2.61"]
  - SE-45-11-10 - 107.0 mm [4.21"]
  - SE-45-18-10 - 178.4 mm [7.02"]
  - SE-45-31-10 - 311.0 mm [12.24"]
  - SE-45-52-10 - 515.0 mm [20.28"]
- Dimensions (excluding connectors)**
- SE-45-7-10 - 144 mm [5.67"] H x 36 mm [1.42"] W x 188.2 mm [7.05"] L
  - SE-45-11-10 - 144 mm [5.67"] H x 36 mm [1.42"] W x 229.0 mm [9.02"] L
  - SE-45-18-10 - 144 mm [5.67"] H x 36 mm [1.42"] W x 300.4 mm [11.83"] L
  - SE-45-31-10 - 144 mm [5.67"] H x 36 mm [1.42"] W x 433.0 mm [17.05"] L
  - SE-45-52-10 - 144 mm [5.67"] H x 36 mm [1.42"] W x 637.0 mm [25.08"] L
- Approximate Weight**
- SE-45-7-10 - 0.91 kg (2.0 lbs)
  - SE-45-11-10 - 1.0 kg (2.2 lbs)
  - SE-45-18-10 - 1.22 kg (2.7 lbs)
  - SE-45-31-10 - 1.63 kg (3.6 lbs)
  - SE-45-52-10 - 2.27 kg (5.0lbs)



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## INPUTS AND OUTPUTS

- Communication Port** - Ethernet Based – 100 Mbps – Auto MDIX (Medium-Dependent Interface Crossover)
- Sensor Output (4) (2 connectors) Individually Programmable** - Maximum Output +20 mA  
0 to 10 mA (Default), 400 ohm load, Maximum  
0 to 20 mA (Available), 125 ohm load, Maximum  
4 to 20 mA (Available), 125 ohm load, Maximum

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## CABLE RESTRICTIONS

### Connection to X1, Ethernet

The Ethernet cable must be the type that includes a shield.

The Ethernet Maximum Drop Length of 100 Meters [330 ft] applies to this cable.

The minimum bend radius of the factory supplied Ethernet cable is 90mm [3.54 inches].

### Connection to X2 and X3

Maximum Cable Length for these cables is based on sensor size and application. Refer to drawing 208004 for maximum cable lengths.



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**CERTIFICATIONS AND ENVIRONMENTAL COMPATIBILITY**

**Product Certification**            -            CE  
**Protection Class,**                -            IP 50



MAXCESS INTERNATIONAL COMPANIES



GUIDING · INSPECTION



TENSION CONTROL



SLITTING · WINDING

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