Shown: SLS-2

SafeLink provides wireless communication between the fixture mounted SEND unit and the machine control interfaced RECEIVE unit.

A pressure switch is used on the fixture to monitor the circuit pressure. If the pressure switch on the fixture goes open, the RECEIVE unit communicates the changed status to the machine control through either 24 VDC, Modbus RTU RS485 or Ethernet IP protocol or Modbus TCP/IP.

The machine control would interrupt the machining process. The SEND unit can also be used with limit switch based position sensing clamps to verify clamped or unclamped status for robotically loaded systems.

WIRELESS communication between a fixture circuit and the machine control

- Fixture mounted “SEND” unit uses radio communication to monitor pressure and/or clamp position
- 2.4 GHz Frequency Band for global acceptance
- “Frequency Hopping” used to for signal stability, even in busy production environments
- “SEND” units are easily reassigned to a different “RECEIVE” unit so fixtures can be moved between machines
- No limit to the number of systems used in a production area
- “SEND” units are internally powered by a replaceable 3.6 VDC Lithium battery – provides up to 3-year battery life
- “SEND” units are sealed to IP-67 for protection from contamination and coolant
- LED lights for visual status indication
- LCD Display window for set-up and status display

Model Number	Description
SLS-1	“SEND” Unit with Internal Antenna
SLS-2	“SEND” Unit with External Antenna
SLS-3	“SEND” Unit with External Antenna, 3 Inputs
SLR-1	“RECEIVE” Unit with External Antenna
SLR-2	“RECEIVE” Unit with External Antenna, 3 Inputs
SLS-2AC	.2m Antenna Cable
SLEM-1	Expansion Module for SLR
SLEB-1	Ethernet Bridge for SLR-1
SLSC-1	Power and Communication Splitter Cable for SLEB-1
SLDB-1	DIN Rail Mounting Bracket

Product specifications

IP Rating	Radio Frequency	Transmit Power	Input Power for RECEIVE Unit	Outputs	FCC Rating	Receiver Commun-ication Protocols	Additional Outputs available from Receiver
IP 67	2.4 GHz	21 dBm conducted	+10 VDC to +30 VDC	+24 VDC	FCC Part 15, Subpart C, 15.247	Modbus RTU RS485 Ethernet IP Modbus TCP/IP	24 VDC Max from Receiver: 6
Dust tight, immersion up to 1 meter	Global Standard		Supplied by machine control	NMOS Sinking			

Radio Frequency: 2.4 GHz

IP Rating: 67

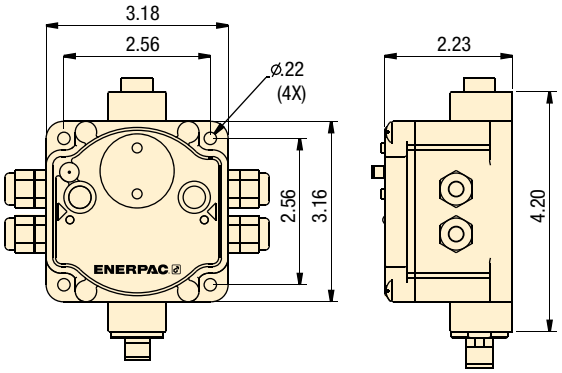
Communication protocols:
Modbus RTU RS485
Ethernet TCP IP

(E) Monitoreo Inalámbrico

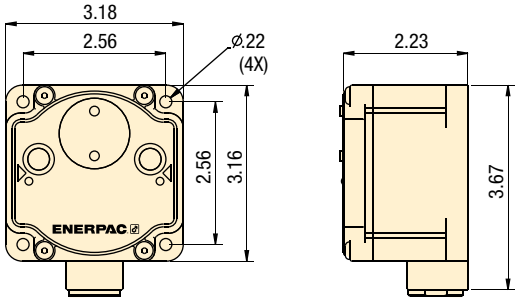
(F) Contrôle sans fil

(D) Drahtlose Überwachung

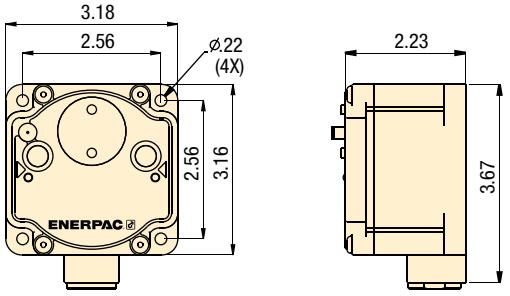
SLR-1 / SLR-2 RECEIVE UNIT



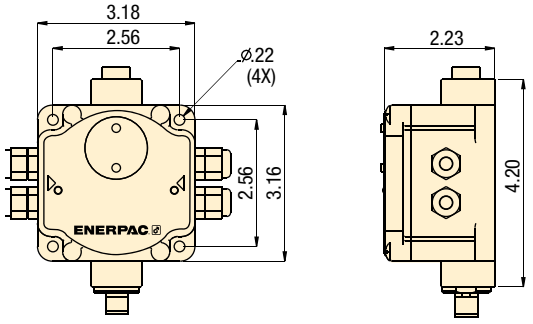
SLS-1 SEND UNIT



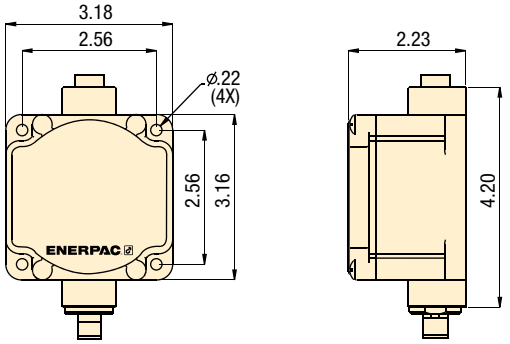
SLS-2 /SLS-3 SEND UNIT



SLEM-1 EXPANSION MODULE



SLEB-1 ETHERNET BRIDGE



Important

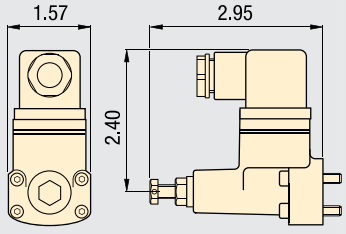
A Pressure Switch is required to monitor the pressure in the fixture circuit. For a convenient manifold mount model, use the PSCK-8 or PSCK-9 from Enerpac.

Manifold Mount Pressure Switch

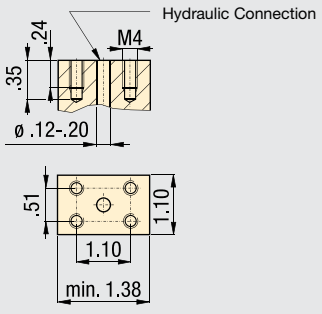
IP Rating: 65 (Dust and Water Jet)

PSCK–8: Range 1450–5000 psi (100-345 bar)

PSCK–9: Range 290–3045 psi (20-210 bar)



Mounting Dimensions



SafeLink *Systems using 24 VDC output*

Shown: SLS-1

SafeLink can provide a discrete 24VDC output signal for systems of up to 4 fixtures. Each SEND unit can provide up to three outputs to the RECEIVE unit. The RECEIVE unit has 6 terminal stations , which are assigned to SEND units in groups of 3. So each RECEIVE unit can be paired with 2 SEND units when using the 24VDC output. For extra capacity, an EXPANSION MODULE provides an additional terminal strip, adding 2 more sets of three terminal stations.

SLCS-1 Splitter Cable

The **SLSC-1 Splitter Cable** is used with the **SLEM-1** Expansion Module and the **SLEB-1** Ethernet Bridge to connect to the **SLR-1** RECEIVE unit and the machine control circuit.

Basic System with I/O Machine Interface

PALLET #1
correct pressure →
cylinder retracted →

SLS-2 "SEND" unit

PALLET #2
correct pressure →
cylinder retracted →

SLS-2 "SEND" unit

SLR-1 "RECEIVE" unit

PALLET #1
correct pressure →
cylinder retracted →
SEND/RECEIVE connected →

PALLET #2
correct pressure →
cylinder retracted →
SEND/RECEIVE connected →

machine controller

Output to machine controller: 24 VDC from RECEIVE unit.

Larger System with I/O Machine Interface

PALLET #1
correct pressure →
cylinder retracted →

SLS-2 "SEND" unit

PALLET #2
correct pressure →
cylinder retracted →

SLS-2 "SEND" unit

PALLET #3
correct pressure →
cylinder retracted →

SLS-2 "SEND" unit

PALLET #4
correct pressure →
cylinder retracted →

SLS-2 "SEND" unit

SLCS-1 "SPLITTER CABLE"

SLR-1 "RECEIVE" unit

SLEM-1 "EXPANSION MODULE"

PALLET #1
correct pressure →
cylinder retracted →
SEND/RECEIVE connected →

PALLET #2
correct pressure →
cylinder retracted →
SEND/RECEIVE connected →

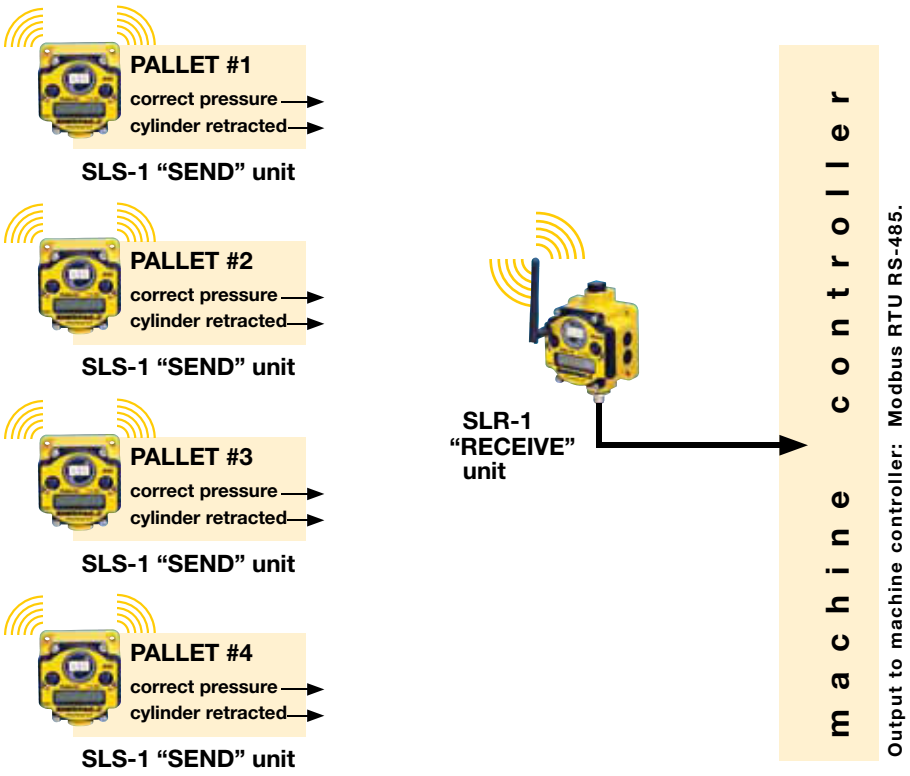
PALLET #3
correct pressure →
cylinder retracted →
SEND/RECEIVE connected →

PALLET #4
correct pressure →
cylinder retracted →
SEND/RECEIVE connected →

machine controller

Output to machine controller: 24 VDC from RECEIVE unit and EXPANSION MODULE.

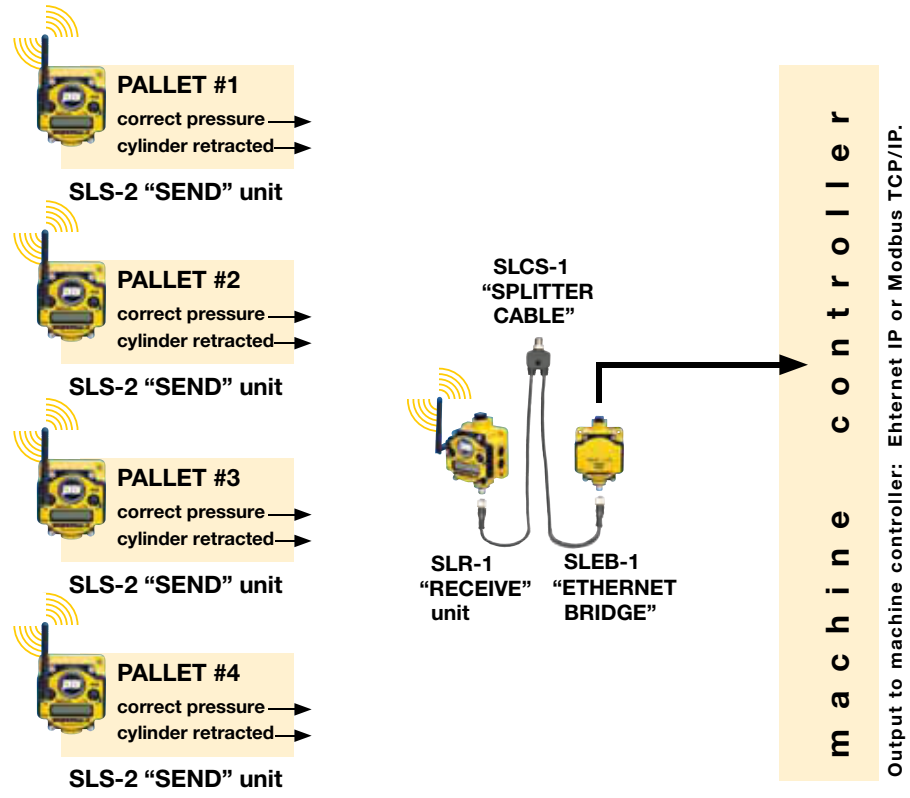
Larger System with Modbus RTU Machine Interface



Shown: SLR-1

SafeLink RECEIVE units can supply the outputs by using the standard Modbus RTU RS-485 protocol. This output uses the 5 pin connector on the RECEIVE unit. If Ethernet protocol is preferred, an ETHERNET BRIDGE is available to convert the Modbus RTU R-485 to ETHERNET IP or Modbus TCP/IP.

Larger System with Ethernet IP Machine Interface



Shown: SLEB-1

The SLEB-1 Ethernet Bridge is used with the SLR-1 Receiver when Ethernet connection is available in the machine control. Use of the SLEB-1 will allow the monitoring of more fixtures in a large pallet pool system.

SafeLink *FAQ*

Shown: SLR-1

SafeLink provides wireless communication between the fixture mounted SEND unit and the machine control interfaced RECEIVE unit. If the pressure switch on the fixture goes open, the RECEIVE unit communicates the changed status to the machine control through either 24 VDC Modbus RTU RS485 or Ethernet TCP IP protocol. The machine control would interrupt the machining process. The SEND unit can also be used with limit switch based position sensing clamps to verify clamped or unclamped status for robotically loaded systems.

▶ WHAT IS SAFELINK?

SafeLink is a wireless way to communicate between a palletized fixture and a machine control.

▶ WHY USE SAFELINK?

SafeLink can monitor the fixture pressure and clamp position in real time- even when parts are being machined. The system can also be used to verify that the operator has properly pressurized the fixture before it is sent in to be machined. If there is a pressure deficiency, the signal between the Send and Receive units is interrupted, and the machine control can respond before expensive damage occurs.

▶ HOW DOES SAFELINK WORK?

SafeLink uses 2.4 GHz radios to allow the SEND unit on the fixture to communicate with the RECEIVE unit that is interfaced with the machine control. The RECEIVE unit provides both 24 VDC outputs and a standard Modbus RTU RS485 communication protocol. An optional Ethernet Bridge will convert this to an Ethernet TCP IP protocol. The machine control must be set up to respond to this protocol to initiate a Feed Hold command, turn on a warning light, or even activate a Machine Stop command.

A pressure switch for pressure monitoring or a limit switch for position sensing is used with the SEND unit. If the pressure or position is lost, the switch goes open and the signal to the RECEIVE unit is interrupted.

▶ WHAT POWERS THE SEND UNIT?

The SEND unit uses a 3.6 VDC size D Lithium battery that is supplied with the unit.

Projected battery life is 3 years.

▶ WHAT POWERS THE RECEIVE UNIT?

The receive unit requires 24 VDC power, usually from the power supply in the machine control.

▶ WILL THE MACHINE FAULT IF THE PALLET IS IN THE LOADING STATION AND THE CLAMPS ARE UNCLAMPED?

The Receive unit is just an input source for the machine control. The machine control must be able to identify which fixture is in the machine being run and which one is in the loading station. When in the loading station, the machine control must be able to ignore the signal loss when the clamps are unclamped to remove the completed parts.

▶ HOW MANY FIXTURES CAN BE MONITORED BY ONE RECEIVE UNIT?

By using either Modbus RTU RS485 or Ethernet TCP IP, up to 56 SLS-1 or SLS-2 Send Units on fixtures can be monitored by a single SLR-1Receive Unit.

▶ IS INSTALLATION AVAILABLE FROM ENERPAC?

Enerpac has partnered with a CNC control specialist that can quote custom installation services. Contact your Enerpac Territory Manager for details.

SafeLink pallet monitoring system

For customers who require custom installation of the Enerpac SafeLink pallet monitoring system, please provide the following information for each machine tool to be evaluated:

Company: _____ City, State, Zip: _____

Contact: _____ Contact Phone (ext): _____

Address: _____ Contact Email: _____

BUDGET

Budget for custom installation of SafeLink system on this machine tool:

$500	$1000	$2500	$5000+

MACHINE INFORMATION

Machine Make	
Machine Model	
Machine Serial Number	
Machine Type	
Single Bed Horizontal Machining Center	
Pallet Pool Cell with Horizontal Machining Centers	
Number of Machines in Cell	
Single Bed Vertical Machining Center	
Two Pallet Vertical Machining Center	
Slide By	
Vertical Turret Lathe (VTL)	
Other/Describe	
Number of Fixtures Associated with This Machine	
Total Number of Circuits in Fixture Group	

MACHINE CONTROL INFORMATION

Machine Control/Make				
Machine Control/Model Number				
Machine Control/Serial Number				
Machine Control Interface Available	Modbus	Ethernet	DeviceNet	Relay
	Serial RS-232	Other/Describe		
Machine Control IP Address				
Action if Fault is Detected	Feedhold		Activate a Light	
	Machine Stop		Other/Describe	

Contact Enerpac: info@enerpac.com • Phone 414-747-8315 • Fax 414-769-9247