essex inc.

MACHINE TO OPERATOR
COMMUNICATION SYSTEM

OWNER'S MANUAL

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PLC SYSTEM SPECIFICATIONS

Power Supply Voltage / frequency	AC DC	100 to 240 VAC, 50/60 Hz 24 VDC
Operating Voltage range	AC DC	85 to 264 VAC 20.4 to 26.4 VDC
Power Consumption	AC DC	60 VA max. 20 W max.
Inrush current		60 A max.
External power supply	Voltage Output capacity	24 VDC 200 mA
Insulation resistance		20 mega ohms min. at 500 VDC between AC terminals and ground terminal
Noise resistance		1500 V (peak to peak) with a pulse width of 0.1 to 1 microsecond 1 nanosecond rise time pulse (tested with noise simulator)
Dielectric strength		2300 VAC at 50/60 Hz for one minute with leakage current of 10 mA max. between all the external AC terminals and ground terminal
Vibration resistance		10 to 57 Hz width and amplitude of 0.075 mm, and 57 to 150 Hz with an acceleration of 9.8 m/s^2 (IG) in X, Y, and Z directions for 80 minutes each (ie. Swept for 8 minutes, 10 times)
Shock resistance		147 m/s2 (15 G) in X, Y and Z directions 3 times each.
Operating Conditions	Ambient temperature	0 to 55 degrees C (32 to 122 degrees F)
	Ambient humidity	10% to 90% (no condensation)
	Ambient environment	With no corrosive gas
Storage conditions	Ambient temperature	-20 to 75 degrees C (-4 to 165 degrees F)
Power supply holding time		10 ms minimum for AC models and 2 ms minimum for DC models

CPU SPECIFICATIONS

CPU Feature Summary

Form Factor	Mini-ITX, compatible with microATX (6.75 inches by 6.75 inches 171.45 millimeters by 171.45 millimeters])
Processor	Support for the following: • Soldered-down Dual-Core Intel® Atom® processor
Memory	• One 240-pin DDR2 SDRAM Dual Inline Memory Module (DIMM) socket • Support for DDR2 533 MHz and DDR2 400 MHz DIMMs (DDR2 800 MHz and DDR 667 MHz validated to run at 533 MHz only) • Support for up to 2 GB of system memory
Chipset	Intel® 945GC Chipset, consisting of: • Intel® 82945GC Graphics Memory Controller Hub (GMCH) • Intel® 82801GB I/O Controller Hub (ICH7)
Audio	5.1-channel audio subsystem using the Realtek* ALC662 high definition audio codec
Video	Intel® GMA950 onboard graphics subsystem
Legacy I/O Control	SMSC LPC47M997 based Legacy I/O controller for hardware management, serial, parallel, and PS/2* ports
Peripheral Interfaces	• Four USB 2.0 ports • Two Serial ATA (SATA) headers • One serial port • One parallel port • One Parallel ATA IDE interface with UDMA 33, ATA-66/100 support • PS/2 keyboard and mouse ports • One S-Video output port (not available on the D945GCLF2D desktop board)
LAN Support	10/100/1000 Mbits/sec LAN subsystem using Realtek 8111C GbE LAN adapter device
BIOS	• Intel® BIOS (resident in the SPI Flash device) • Support for Advanced Configuration and Power Interface (ACPI), Plug
Expansion Capabilities	• One PCI Conventional bus connector
Hardware Monitor Subsystem	• Hardware monitoring through the SMSC I/O controller • Voltage sense to detect out of range power supply voltages • Thermal sense to detect out of range thermal values • Two fan headers • Two fan sense inputs used to monitor fan activity • Fan speed control and Play, and SMBIOS

CPU SPECIFICATIONS continued

CPU Environmental Specifications

Parameter	Specification		
Temperature			
Non-Operating	-20 °C to +70 °C		
Operating	0 °C to +55 °C		
Shock			
Unpackaged	50 g trapezoidal waveform		
	Velocity change of 170 inches/second²		
Packaged	Half sine 2 millisecond		
	Product weight (pounds)	Free fall (inches)	Velocity change (inches/sec²)
	<20	36	167
	21-40	30	152
	41-80	24	136
	81-100	18	118
Vibration			
Unpackaged	5 Hz to 20 Hz: 0.01 g² Hz sloping up to 0.02 g² Hz		
	20 Hz to 500 Hz: 0.02 g² Hz (flat)		
Packaged	10 Hz to 40 Hz: 0.015 g² Hz (flat)		
	40 Hz to 500 Hz: 0.015 g² Hz sloping down to 0.00015 g² Hz		

OVERVIEW

The Essex Inc. MOCS, or Machine to Operator Communication System, is designed to work in conjunction with the Essex process control products to automatically audibly alert the operator via wireless communication to any off-standard condition that requires a machine shut down or alarm. MOCS allows one operator to monitor multiple machines without the necessity of constant visual contact. The language of the alerts is selectable.

INSTALLATION

Requirements:

- FCC allocated radio frequencies for wireless communication

Mounting the Control Panel

- Mount for convenience , isolated from machine vibration

Connections to the Control Panel

- 120 VAC power required
- Connect MOCS Interface panel as per included wiring diagram (if applicable)
- Run relay contact to Process Control panel or MOCS Interface panel must be a maintained contact for MOCS to function properly

OPERATION

Whenever a stop event occurs MOCS will automatically alert the operator with an audible alarm, which will repeat on a customizable timed interval until the event is remedied. The audible alarm will automatically cease upon the machine re-starting.

- Select the alarm language. The Language switch is located on the face of the MOCS panel.
- For the Basic MOCS, turn **On** belt-pack receiver and place ear buds in ears.
- For MOCS plus and Supervisor MOCS, turn **On** the transceivers/ radios with the power knob. See below.
- The Operator radio's channel selector must be set to the "**1**" channel. See below
- The Supervisor's radio's channel selector must be set to the "**2**" channel to receive MOCS alerts.. See below
- Alert volume can be adjusted with the volume knob. See below.
- For MOCS Plus, to call a team member, press the Push-To-Talk (PTT) button located on the lapel microphone/speaker and hold. Speak into the microphone, using a normal speaking voice. See below.
- For Supervisor to Operator communication, the supervisor should use the channel selector to view the selectable machine clouds. When the appropriate cloud is displayed on the radio's screen, press the PTT button and speak. See below.
- Release the PTT button to receive a call.

LED Indicator Status

Indicator Color	Meaning
MOCS Plus/Supervisor MOCS radio lights red	Transmitting
MOCS Plus/Supervisor MOCS radio lights green	Receiving a call
MOCS Plus/Supervisor MOCS radio blinks red	Battery power is low while transmitting
MOCS Plus/Supervisor MOCS radio blinks green	Battery power is low while receiving
MOCS Plus/Supervisor MOCS radio blinks red/ orange	Selected channel has not been programmed and cannot be used
Basic MOCS Belt-Pack Receiver lights red	Power On
Basic MOCS Belt-Pack Receiver blinks red	Battery power is low or unit is charging

OPERATION continued

Charging the Radio for MOCS Plus

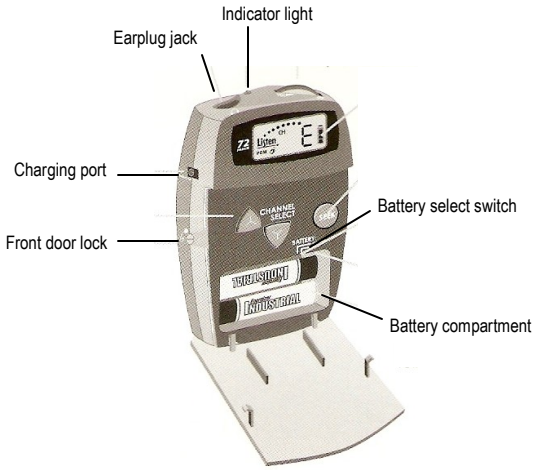
- Charge lasts for approximately 8 hours.
- Charger is included with system and is located on the control panel.
- Slide radio into the charging slot of the charger, making sure that the metal contacts on the radio mate securely with the charger terminals. The charger indicator light will shine red while charging.
- Charge time is approximately 2 hours. When charging is complete the charger indicator light will shine green.
- If the charger indicator light blinks red, the radio's battery pack is either defective or the contacts are not properly mated.

Charging the Receiver for Basic MOCS

- Charge lasts for approximately 8 hours.
- Charger cord is included with system and is located on the control panel.
- Clip Receiver onto control panel and plug charging cord into the charging port. See below
- Charging time is approximately 2 hours.
- The receiver's indicator light will blink red while charging.

Changing the Battery in the Basic MOCS Receiver

- To change the battery unlock the front door panel on the Receiver. See below
- Replace with AA rechargeable batteries. See below



SPARE PARTS

NUMBER	DESCRIPTION	
EPM-10CDR.MI	PLC for MOCS Interface Panel	EA
EPM-10CDR.MM	PLC for MOCS Main Panel	EA
26.15.000.)R	Operator/Supervisor Transceiver/Radio for MOCS Plus	EA
26.15.000.SM	Speaker Microphone for MOCS Plus	EA
26.15.000.A	Antenna for MOCS	EA
26.15.000.T.1	Transmitter for Basic MOCS	EA
26.15.000.RC	Transceiver/Radio Charger for MOCS	EA
26.15.000.PS	12V Power Supply for MOCS	EA
26.15.000.TTL	TTL Relay for Supervisor MOCS	EA
26.15.000.12R	12V Relay for MOCS	EA
26.15.000.NS	Noise Suppressor for MOCS	EA
26.15.000.PC	PC for MOCS	EA
26.15.000.PCPS	PC Power Supply for MOCS	EA
26.15.000.E	OSHA approved Ear Buds for MOCS	SET
26.15.000.BR	Belt-pack Receiver for Basic MOCS	EA
26.15.000.T.2	Transmitter for MOCS Plus	EA
	Rechargeable AA batteries for Basic MOCS Receiver	

TROUBLESHOOTING

MOCS	
Problem	*Solution*
Cannot turn the MOCS Plus radio or Basic MOCS Receiver power ON	The battery pack may be dead. Recharge or replace the battery pack. The battery pack may not be installed correctly. Remove the battery pack and install again.
Battery power dies shortly after charging.	The battery pack is finished. Replace the battery pack with a new one.
Cannot talk to or hear other team members.	Make sure you are using the same channel. Make sure the other team member is within range.

PRECAUTIONS

- **Use only the specified charger and observe charging requirements**
  If the battery is charged in unspecified conditions (under high temperature, excessive voltage or current or with a remodeled charger), it may overcharge or an abnormal chemical reaction may occur. The battery may generate heat or smoke or burst into flame.
- **Do not pierce the battery with any object, strike it with an instrument, or step on it.**
  The battery may generate heat or smoke, rupture, or burst into flame.
- **Do not jar or throw the battery.**
  The battery may generate heat or smoke, rupture, or burst into flame.
- **Do not use the battery pack if it is damaged in any way.**
  The battery may generate heat or smoke, rupture, or burst into flame.
- **Do not solder directly onto the battery.**
  The battery may generate heat or smoke, rupture, or burst into flame.
- **Do not reverse the battery polarity (and terminals).**
  The battery may generate heat or smoke, rupture, or burst into flame.
- **Do not reverse-charge or reverse-connect the battery.**
  The battery may generate heat or smoke, rupture, or burst into flame.
- Failure to ensure appropriate airflow may result in reduced performance of both the processor and/or voltage regulator or, in some instances, damage to the board.
- Ensure that the ambient temperature does not exceed the board's maximum operating temperature. Failure to do so could cause components to exceed their maximum case temperature and malfunction.
- Ensure that proper airflow is maintained in the processor voltage regulator circuit. Failure to do so may result in damage to the voltage regulator circuit.

OPTIONS

Basic MOCS

Description

System will alert the operator with stop information directly and automatically.

Components

- Control panel with one-way radio transmitter and built in charging points for receivers
- Belt pack receivers
- OSHA approved ear buds

MOCS Plus

Description

System will alert the operator with stop information directly and automatically, and also allows 2-way communication between operators.

Components

- Control panel with two-way radio transmitter and built in charging points for transceivers/ radios
- Belt pack transceivers/radios
- Lapel microphone/speaker assembly

Supervisor MOCS

Description

System will alert the operator with stop information directly and automatically, and also allows 2-way communication between operators. In addition, this system will alert supervisory personnel to down-time incidents based on customizable time intervals. These alerts will include down-time and machine information. Allows 2-way communications between supervisors and operators.

Components

- Control panel with two-way radio transmitter and built in charging points for transceivers/ radios
- Belt pack transceivers/radios for operators and/or supervisors
- Lapel microphone/speaker assembly for operators and/or supervisors

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