FACTORY CONFIGURATION

Each MSP-C-OUT unit is configured and calibrated at the factory for the input signal range and voltage output range printed by the factory on the MSP unit's side label. This unit may be interfaced with any programmable logic controller (PLC).

The MSP-C-OUT unit has two output current ranges: the unit is capable of accommodating 0 to 20mA, 4 to 20mA. Unit re-configuration requires SensorPulse's SignalFlex™ Configurator Utility.

This MSP unit may be reconfigured by a user at any time via their personal computer (PC) or handheld personal computer (HPC) by installing SensorPulse Corp's Windows®/PC or Windows®/CE HPC based SignalFlex™ Configurator Utility, interfacing the MSP unit to the computer's RS-232C comm port with an MSP Configuration Cable (sold separately), and changing the unit's input configuration settings.

OPERATIONAL DESCRIPTION

The MSP family of single channel analog I/O modules permits most any analog sensor or actuator (depending upon MSP model type) to be used with any model of PLC (even a PLC without analog capability). Each MSP model (input or output) supports one (1) analog signal type and provides one (1) interface channel with the PLC. The MSP family provides models which provide an analog INPUT to a PLC while other models supply an analog OUTPUT from a PLC.

Communication between MSP unit and PLC is via patented 'single-wire' communication protocol. Supplied with each MSP unit are input and/or output PLC drivers pre-written for the more popular models of major PLC manufacturers. These drivers, written utilizing the programming software of their respective PLC manufacturer, are supplied on diskette and may be cut and pasted into PLC memory.

MSP models may be purchased with a factory pre-set configuration for plug-n-play application or available unconfigured so user may configure the unit to meet their unique needs. All MSP models may be configured/reconfigured by a user at any time through use of an optional SignalFlex™ Configuration Package.

Analog world output signal via MSP unit interfaced to PLC - A small ladder logic program loaded into the PLC is used to generate patented single wire digital data transmission between PLC and MSP unit. A numerical value representing the desired analog output signal value (control variable) is placed into a PLC working register of your choice by PLC program. This value is transmitted serially (one bit at-a-time) at 24 VDC signal levels to the MSP unit via the PLC's discrete I/O port. At the MSP unit that received value is scaled and/or linearized as required and the result used to generate an appropriate analog signal type at the specific value level (determined by the value from the PLC). This analog signal value is applied to the analog actuator wired to the MSP unit's output.

REQUIREMENTS

Mandatory:
- PLC with one (1) +24VDC discrete output
- THIN, MTW or other stranded interface wire to interface MSP unit with PLC I/O
- 15 - 32VDC, 30mA external supply voltage
- PLC Driver Software (supplied with unit)
- Personal or Handheld computer with Windows®/PC or Windows®/CE - to input PLC driver to PLC
- PLC to Personal/Handheld computer communication interface cable

Optional:
- SignalFlex™ Configuration Package (Part No. MSF-CC-A1) Package consists of SignalFlex™ Configurator Utility and MSP Configuration Cable.

INSTALLATION

PLC DRIVER:
1. Insert 'MSP Software' diskette into desired drive of personal or handheld personal computer.
2. Access the drive containing the diskette.
3. Double-click on the 'install.bat' icon. All diskette programs will be unpacked and installed within a directory/folder labeled 'sp' at the root of your PC/HPC.
4. Remove 'MSP Software' diskette from computer.

5. Connect personal or handheld personal computer to PLC programming (comm) port.
6. Select appropriate PLC driver from within 'sp' folder on PC/HPC and copy it to your PLC's program. Then within the PLC's program change the newly installed driver's 'default addresses' to desired real-time addresses.

Hardware:
1. Mount MSP unit on standard TS32 or TS35 DIN rail.
2. See wiring diagram on reverse side. Connect external 15 to 32VDC power source to MSP unit:
   - Positive (+) to MSP terminal +VDC
   - Negative (-) to MSP terminal -VDC
3. Connect output analog device to MSP unit:
   - Current (+) to MSP terminal 1 OUT+
   - Current (-) to MSP terminal COM
4. Connect MSP unit to desired PLC Output point:
   - PLC Output Point to MSP terminal PLC OUTPUT
5. If PLC has “Sinking Outputs” install 1KΩ between MSP terminals PLC OUTPUT and

CONFIGURATION CHANGE

An MSP's configuration can only be changed through use of a personal computer running our Windows® based SignalFlex™ Configurator Utility and a special configuration communication cable to interface the MSP unit and personal computer together. (See Requirements - on reverse side for purchasing information.)

Instructions on how to accomplish configuration change are included with Windows® based SignalFlex™ Configuration Package and not covered here.
**FACTORY CONFIGURATION SETTINGS**

<table>
<thead>
<tr>
<th>PLC Interface</th>
<th>Type</th>
<th>DELTA Protocol</th>
<th>Scan Time</th>
<th>10 mill-seconds</th>
<th>Full Word Bit-Count</th>
<th>4</th>
<th>Full Word Bit-Count</th>
<th>4</th>
<th>DELTA Refresh</th>
<th>16</th>
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</thead>
<tbody>
<tr>
<td>PLC Timing</td>
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<tr>
<td>MSP-C-OUT Wiring Diagram</td>
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</table>

**SPECIFICATIONS**

- **Input Power**: 15-32Vdc
- **Isolation**: 2 way 1500Vrms continuous
- **Update Speed**: 0.1 to 0.5 seconds (PLC dependent)
- **Operating Temp.**: -40 to +75°C
- **Storage Temp.**: -40 to +85°C
- **Mounting**: 32 and 35mm DIN Rail & G Rail
- **Dimensions**: 75mm H X 12.2mm W X 60 mm D
- **Max. Pulse Width**: 10 µsec
- **Max. Pulse Frequency**: 10000 Hz
- **Max. Current**: 100 mA
- **Max. Voltage**: 30 Vdc
- **Accuracy**: ±0.05%

For order entry, application, or customer service assistance, call toll-free 800-447-5900

**Diagnostic Tools**

- Two LEDs: one RED and one GREEN are located on the front face of the MSP's enclosure and provide user with visual indication as to unit operating condition.

**LED Functionality**

- LED's have three operational states:
  - Steady On
  - Steady Off
  - Blinking

**Condition**

- **GREEN = BLINKING**: RED = Steady OFF

**Meaning**

- **Unit is processing data**

**Condition**

- **GREEN = Steady ON**: RED = Steady ON

**Meaning**

- **Unit is off-line with PLC due to**
  - 1) Unit is uploading information from onboard memory
  - 2) Unit is downloading information to onboard memory
  - 3) No configuration data is available from onboard memory

**Warning**

- This unit is protected against abnormally high voltages. Input power-up requires a minimum of 15Vdc; any voltage less than this will cause damage to the unit.

**Caution**

- The torque specification for tightening the wire terminal set screws is 2.0 in-lb. Any torque greater than this will cause damage to the unit.

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All Prices and Specifications subject to change without notice