

MSP OPEN I/O Family

Model MSP-TC-IN Single Channel Module

NOTE: THIS IS A FACTORY CONFIGURED UNIT

FACTORY CONFIGURATION

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

The MSP-TC-IN unit is capable of accommodating B-type, E-Type, J-Type, N-Type, K-Type, R-type, S-type and T-Type thermocouples covering their more common temperature ranges. 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 MSF Configuration Cable, 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 preset configuration for plug-n-play application or custom configured to meet their unique need. All MSP models may be configured/reconfigured by a user at anytime through use of an optional SignalFlex™ Configuration Package.

Analog world input signal interfaced to PLC via MSP unit - An analog world input signal arriving at the MSP unit is isolated, filtered, am-

plified, scaled and/or linearized (if necessary) by the units onboard microprocessor and converted to a 16-bit, binary weighted, digital word. The 16-bit word is presented to the PLC's discrete input port serially (one bit-at-a-time) and each bit is present at the PLC input for several PLC scantime periods. At the PLC the bit level is temporarily stored until all 16-bits have been received, then the assembled 16-bit word is converted to its appropriate integer value and that value placed into a working register so the PLC program can make decisions based upon the register value.

REQUIREMENTS

Mandatory:

- PLC with one (1) +24VDC discrete input
- THHN, MTW or other stranded interface wire to interface MSP unit with PLC I/O
- 15 - 32VDC, 50mA 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 MSF 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.

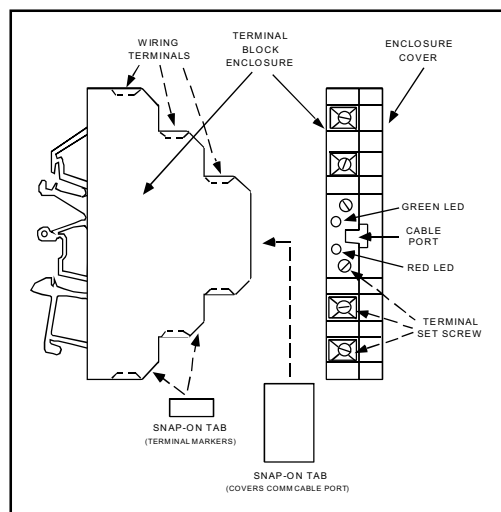
Hardware:

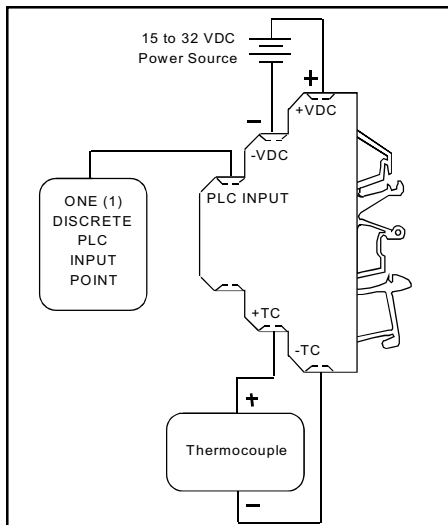
1. Mount MSP unit on standard TS32 or TS35 DIN rail.
2. See wiring diagram on reverse side. Connect external 15 to 32VDC power source to MSP unit: Positive (+) to MSP terminal +VDC Negative (-) to MSP terminal -VDC
3. Connect input thermocouple to MSP unit: Positive (+) to MSP terminal +TC Negative (-) to MSP terminal -TC
4. Connect MSP unit to desired PLC Input point: PLC Input Point to MSP terminal PLC INPUT

CONFIGURATION CHANGE

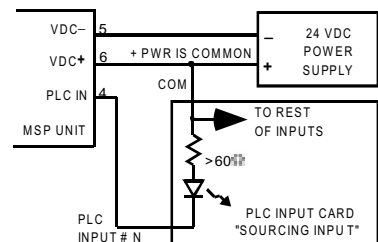
An MSP's configuration can only be changed through use of a personal computer running our Windows® based SignalFlex™ Configurator Utility and a special configuration communication cable to interface the MSP unit and personal computer together. (See Requirements - on reverse side for purchasing information.)

Instructions on how to accomplish configuration change are included with MSP Configuration Package and not covered here.

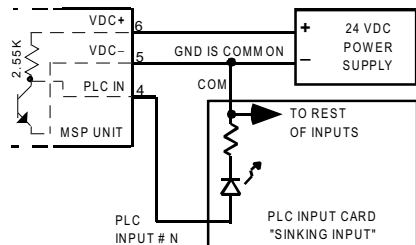




The MSP unit communication port is a SOURCING output. This protocol will allow interface to discrete input channels on PLCs that are either SOURCING inputs or SINKING inputs.



Data transmission from MSP unit to SOURCING inputs will be inverted as it is read into the PLC. The PLC driver ladder logic must invert the discrete signal again in order to read the data.



MSP-TC-IN Wiring Diagram

FACTORY CONFIGURATION SETTINGS

PLC Interface:

Type:	DELTA Protocol	
Scan Time:	10 mil-Seconds	
Full Word Bit-Count:	16	
DELTA Word Bit-Count:	4	
DELTA Refresh:	16	

PLC Timing:

	MSP-x-IN	MSP-x-OUT
ID Pulse Width:	1.2	3
DATA Pulse Width:	3	3

General:

Filter Frequency:	60Hz
Scale X 10:	ON
Burn-Out Detect	UP-SCALE

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 operation.

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 in onboard memory

Condition: GREEN = BLINKING
RED = BLINKING

Meaning: Unit is processing data but data is outside of configured range

All other combinations indicate the unit is not operating correctly.

Warning: Initial power-up requires a minimum of 15Vdc, and a maximum of 32 Vdc. Any voltage outside this range will cause damage to the unit. When installing or servicing the unit, take the precautionary steps in preventing any electrostatic discharge 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.

SPECIFICATIONS

Input Power: 15-32Vdc
Isolation: 2 way input to output/power 1500V rms
Over Voltage: 240VRMS continuous
Update Speed: 0.1 to 0.5 seconds (PLC dependant)
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
(2.95" X 0.485" X 2.5"), 24 modules can be installed per linear foot of DIN Rail
Diagnostics LEDs: Active and alarm indications
Maximum Wire Size: 14 AWG
Torque for wiring to terminal set screws: 2.0 in/lb Max.
Input Type: Thermocouple - B-Type, E-Type, J-Type, K-Type, N-Type, R-Type, S-Type, T-Type, or Millivolts
Input Range: (Full Range Configurable + -75 mV)
B-Type 0 to +1832°C, +32 to +3329°F
E-Type -100 to +1000°C, -148 to +1832°F
E-Type -200 to 0°C, -328 to +32°F
J-Type 0 to +760°C, +32 to +1400°F
J-Type -200 to 0°C, -328 to +32°F
K-Type 0 to +1370°C, +32 to +2498°F
K-Type -200 to 0°C, -328 to +32°F
N-Type -200 to 0°C, -328 to +32°F
N-Type 0 to +1300°C, +32 to +2372°F
R-Type 0 to 1768°C, +32 to +3214°F
S-Type 0 to 1768°C, +32 to +3214°F
T-Type -200 to 0°C, -328 to +32°F
T-Type -160 to +400°C, -256 to +752°F
T-Type 0 to +400°C, +32 to +752°F
Accuracy: ±0.05% of full scale
Resolution: .1°C or .1°F
Output: Serial Pulses to PLC Input Point

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When returning material to SensorPulse, the RA# must be included on all shipping documents and prominently displayed on the outside of the shipping container -- this will reduce your turn around time.

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INSTALLATION AND SAFETY GUIDANCE NOTES

Environment - SensorPulse Corp. products are designed to operate reliably and safely in their specified environment. However the following guidelines must be followed to ensure Safety, Electromagnetic Compatibility and Performance.

- Products have been tested for the Industrial Environment (BS EN 50081-2 and 50082-2) unless otherwise stated. Operation in any other environment is not guaranteed and at the risk of the User.
- The User is required to suppress high energy transients, such as those caused by lightning strikes, unless the product is specified for such purposes. Non-resistive loads and contact arcing must be suppressed at source.
- Products are intended for installation inside an equipment cabinet or suitable enclosure unless otherwise specified. This should be accessible only to qualified personnel during commissioning and maintenance. Open chassis products for use above 50V should only be accessible by the removal of a cover using a key or tool.
- Anti-static precautions and conventional Instrumentation best practice must always be observed. Each active module should be protected by a suitably rated fuse or equivalent protection device.

Product EMC Performance - The performance of SensorPulse Corp. products that fall within the scope of the EMC directive will meet the requirements of the relevant performance criteria as determined by the particular tests listed in the EMC standards. Products may temporarily be affected by the application of some electromagnetic disturbances but will return to published specification thereafter. Individual product details on request.

Directives - SensorPulse Corp. products are intended for installation by qualified personnel into a larger piece of equipment or system and are not accessible by the operator or that equipment or system under normal use. They do not contain any moving parts as defined by the Machinery Directive and do not fall within the scope of either the Machinery Directive or the Low Voltage Directive unless otherwise stated. The responsibility for the final equipment or system lies with the builder of that equipment or system. It is the duty of the system designer or installation engineer to ensure that our products are used in accordance with our instructions and that current safety, wiring and other relevant regulations are followed.



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

All Prices and Specifications subject to change without notice

SensorPulse Corp. a division of Easton Controls Inc.

120 Hupp Road Building R-6-4

Kingsbury, IN 46345

Phone: 800-447-5900/219-393-7218

Fax: 219-393-7318