# Isolated signal converter

## Economical Signal Converter for Process and Temperature applications

**DR-I3P**

1 YEAR WARRANTY


**DR-I3P shown smaller than actual size.**

OMEGA's new isolated signal converter delivers high-performance for integration in a wide range of industrial applications. The DR-I3P accepts universal inputs including mA and Vdc process signals (provides +15Vdc excitation voltage), usual temperature signals such as Pt100, Pt500, Pt1000, Ni100, Ni1000, NTC, thermocouples J, K, N, E, T, R and S, resistances and potentiometer signals, offering application flexibility for signal acquisition and industrial requirements.

A single universal AC/DC power supply allows this unit to be suited for global use.

Configurable output in 4/20mA or 0/10Vdc, high levels of isolation and DIN rail mount.

Additional features of the DR-I3P isolated signal converter include ready to use '*out of the box*' unit, with no additional configuration tools needed, easy configuration by programming codes, and special '*force*' functions for installation testing.

**APPLICATIONS**
- **Assembly Line**
- **Control Panel**
- **Laboratory**

- **'Force' functions - Built in 'Force Low' and 'Force High' functions provide an easy way to generate 4 and 20 mA otput signals (or 0 and 10 Vdc) to easily validate connections to remote instruments, such as PLCs. of PLC connections.**

- **Isolation - 3 way isolation to protect your remote systems from signals noise and ground loops, delivering better performance.**

- **Universal power supply - Real universal power supply from 18 to 265 Vac/dc, allows for global use and consolidation of stock references.**

- **Easy configuration with codes from 00 to 99 and predefined input ranges. No additional tools needed for configuration, can be installed 'out of the box'.**

- **High quality plug-in screw terminals for easy maintenance and replacements.**

- **Password Protection to protect your configuration**

## Specifications

### Input signal

**Process:** 4/20mA (active and passive, max 25mA, $V_{term}$<1.2Vdc), 0/10Vdc (max. 25Vdc, $Z_{in}$=1MOhm)
**Excitation Voltage:** +15Vdc (@30mA)
**Thermocouple:** J, K, N, E, T, R and S
(automatic compensation for the thermocouple cold junction)
**'Pt' and 'Ni' probes:** Pt100 (2 and 3 wires, with automatic cable compensation up to 30Ohm), Pt500, Pt1000, Ni100, Ni1000 (2 wires)
**'NTC' probes:** NTC (with $R_{25}$=10K, Beta=3500), NTC 44006
**Resistances:** ranges for 100K, 50K, 25K, 5K and 2.5KOhms
**Potentiometers:** nominal from 500Ohm up to 20KOhm potentiometers

**Accuracy at 25ºC:** (see Table 4)
**Thermal Stability:** 150ppm/ºC
**Step response:** 300mSec. (0% to 99% of signal)

### Output signal

**4/20mA active:** max.22mA, min.1.5mA, load<400Ohm
**4/20mA passive:** max.30Vdc on terminals
**0/10Vdc:** max.11Vdc, min.-1Vdc, load>1KOhm

### Configuration

**display:** 2 digits, 7 segments, 5mm height, red color
**keypad:** 2 keys

### Power

**Power:** 18 to 265Vac/dc (isolated 2500Veff) (20 to 240Vac/dc ±10%)
**AC frequency:** 45 to 65Hz
**Consumption:** <1.5W
**Power terminals:** plug-in screw terminals (5.08mm pitch)
**Power wires:** 1mm² to 2.5mm² (AWG17 to AWG14)
**Overvoltage category:** 2

### Isolation

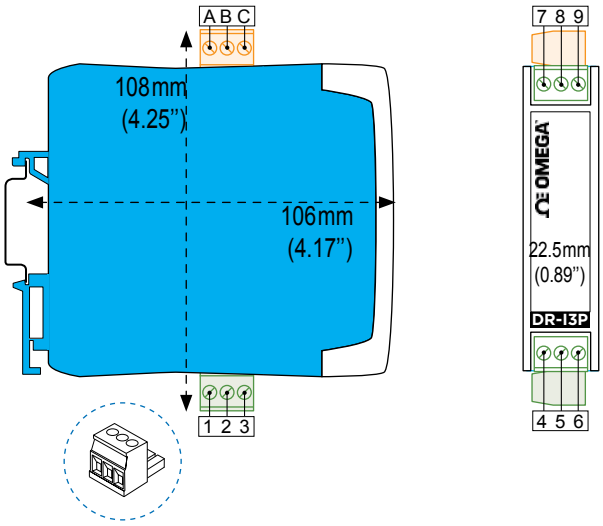
**input - output:** 2300Veff (60 seconds)
**power - input:** 2300Veff (60 seconds)
**power - output:** 2300Veff (60 seconds)

### Temperature

**Operation temperature:** 0 to +50ºC (32 to 122 ºF)
**Storage temperature:** -20 to +70ºC (-4 to 158 ºF)
**Warm-up time:** 15 minutes

### Mechanical

**Size:** 106x108mmx22.5mm
**Mounting:** standard DIN rail (35x7.5mm)
**Connections:** plug-in screw terminals (pitch 5.08mm)
**Weight**: <150gr (5.3 oz)
**Housing material**: polyamide V0
**IP protection:** IP30
**Impact protection:** IK06
**Packing box:** 120x115x30mm, cardboard




**Detail of the plug-in screw terminal. Both male and female terminals are included.**

Table 1 | **INPUT signal connections**

| Input signal | Input terminals | | | | | |
|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 |
| 4/20mA passive | | | | | mA- | Vexc |
| 4/20mA active | | | | mA- | mA+ | |
| 0/10Vdc | | | | common | +Vdc | |
| 0/10Vdc with Vexc | | | | common | +Vdc | Vexc |
| Potentiometer | | | | Pot.- | Potent. | Pot.+ |
| Resistance | Res- | | Res+ | | | |
| NTC | NTC- | | NTC+ | | | |
| Thermocouple | tc- | tc+ | | | | |
| Pt100 (3 wires) | Pt- | Pt- (3rd wire) | Pt+ | | | |
| Pt100 (2 wires) | Pt- (shortcircuit 1 and 2) | | Pt+ | | | |
| Pt1000, Pt500 | Pt- | | Pt+ | | | |
| Ni100, Ni500, Ni1000 | Ni- | | Ni+ | | | |

Table 2 | **OUTPUT signal connections**

| Output signal | Output terminals | | |
|---|---|---|---|
| | 7 | 8 | 9 |
| 4/20mA active | | mA- (in) | mA+ (out) |
| 4/20mA passive | mA+ (out) | mA- (in) | |
| 0/10Vdc | common | | +Vdc |

Table 3 | **POWER connections**

| Power | Power terminals | | |
|---|---|---|---|
| | A | B | C |
| AC power | Phase | | Phase |
| DC power | + | | - |

## To Order

| Model No. | Description |
|---|---|
| **DR-I3P** | Isolated signal converter with 85/265Vac/dc power supply |
| **Comes complete with quick installations guide.** | |

Table 4 | **Input signal - Configuration codes**

| Code | Input signal range | | Technical specs |
|---|---|---|---|
| 00 to 09 | [no function assigned] | | --- |
| 10 | 4/20 mA | Process | total error <0.3%FS |
| 11 | 0/10 Vdc | Process | total error <0.3%FS |
| 12 | 0/100 % | Potentiometer | total error <1.0%FS |
| 13 | 0/100 KOhm | Resistance | total error <0.7%FS |
| 14 | 0/50 KOhm | Resistance | total error <0.7%FS |
| 15 | 0/25 KOhm | Resistance | total error <0.7%FS |
| 16 | 0/10 KOhm | Resistance | total error <0.7%FS |
| 17 | 0/5 KOhm | Resistance | total error <0.7%FS |
| 18 | 0/2.5 KOhm | Resistance | total error <0.7%FS |
| 19 | 0/1200°C | Thermocouple J (cold junction error included) | total error <0.5%FS |
| 20 | 0/1000°C | Thermocouple J (cold junction error included) | total error <0.5%FS |
| 21 | 0/800°C | Thermocouple J (cold junction error included) | total error <0.5%FS |
| 22 | 0/600°C | Thermocouple J (cold junction error included) | total error <0.5%FS |
| 23 | 0/450°C | Thermocouple J (cold junction error included) | total error <0.7%FS |
| 24 | 0/300°C | Thermocouple J (cold junction error included) | total error <1.5%FS |
| 25 | 0/150°C | Thermocouple J (cold junction error included) | total error <2.5%FS |
| 26 | 0/1350°C | Thermocouple K (cold junction error included) | total error <0.5%FS |
| 27 | 0/1000°C | Thermocouple K (cold junction error included) | total error <0.5%FS |
| 28 | 0/800°C | Thermocouple K (cold junction error included) | total error <0.5%FS |
| 29 | 0/600°C | Thermocouple K (cold junction error included) | total error <0.7%FS |
| 30 | 0/450°C | Thermocouple K (cold junction error included) | total error <1.0%FS |
| 31 | 0/300°C | Thermocouple K (cold junction error included) | total error <2.0%FS |
| 32 | 0/150°C | Thermocouple K (cold junction error included) | total error <3.5%FS |
| 33 | 0/1300°C | Thermocouple N (cold junction error included) | total error <0.5%FS |
| 34 | 0/1000°C | Thermocouple N (cold junction error included) | total error <0.5%FS |
| 35 | 0/800°C | Thermocouple N (cold junction error included) | total error <0.5%FS |
| 36 | 0/600°C | Thermocouple N (cold junction error included) | total error <0.7%FS |
| 37 | 0/450°C | Thermocouple N (cold junction error included) | total error <1.5%FS |
| 38 | 0/300°C | Thermocouple N (cold junction error included) | total error <2.0%FS |
| 39 | 0/150°C | Thermocouple N (cold junction error included) | total error <3.5%FS |
| 40 | [no function assigned] | | --- |
| 41 | 0/900°C | Thermocouple E (cold junction error included) | total error <0.5%FS |
| 42 | 0/600°C | Thermocouple E (cold junction error included) | total error <0.5%FS |
| 43 | 0/450°C | Thermocouple E (cold junction error included) | total error <0.5%FS |
| 44 | 0/300°C | Thermocouple E (cold junction error included) | total error <0.7%FS |
| 45 | 0/150°C | Thermocouple E (cold junction error included) | total error <2.0%FS |
| 46 | 0/400°C | Thermocouple T (cold junction error included) | total error <1.0%FS |
| 47 | 0/300°C | Thermocouple T (cold junction error included) | total error <1.3%FS |
| 48 | 0/200°C | Thermocouple T (cold junction error included) | total error <2.0%FS |
| 49 | 0/100°C | Thermocouple T (cold junction error included) | total error <4.0%FS |

Table 4 | **Input signal - Configuration codes**

| Code | Input signal range | | Technical specs |
|---|---|---|---|
| 50 | 0/1750°C | Thermocouple R (cold junction error included) | total error <1.0%FS |
| 51 | 0/1500°C | Thermocouple R (cold junction error included) | total error <1.0%FS |
| 52 | 0/1200°C | Thermocouple R (cold junction error included) | total error <1.5%FS |
| 53 | 0/900°C | Thermocouple R (cold junction error included) | total error <2.0%FS |
| 54 | 0/1750°C | Thermocouple S (cold junction error included) | total error <1.0%FS |
| 55 | 0/1500°C | Thermocouple S (cold junction error included) | total error <1.0%FS |
| 56 | 0/1200°C | Thermocouple S (cold junction error included) | total error <1.5%FS |
| 57 | 0/900°C | Thermocouple S (cold junction error included) | total error <2.0%FS |
| 58 | [no function assigned] | | --- |
| 59 | 0/700°C | Pt100 | total error <0.5%FS |
| 60 | 0/600°C | Pt100 | total error <0.5%FS |
| 61 | 0/500°C | Pt100 | total error <0.6%FS |
| 62 | 0/400°C | Pt100 | total error <0.6%FS |
| 63 | 0/300°C | Pt100 | total error <0.7%FS |
| 64 | 0/200°C | Pt100 | total error <1.0%FS |
| 65 | 0/100°C | Pt100 | total error <1.5%FS |
| 66 | -50/+50°C | Pt100 | total error <1.5%FS |
| 67 | -100/+100°C | Pt100 | total error <1.0%FS |
| 68 | -200/+200°C | Pt100 | total error <0.5%FS |
| 69 | 0/630°C | Pt500 | total error <0.7%FS |
| 70 | 0/300°C | Pt500 | total error <0.7%FS |
| 71 | -150/150°C | Pt500 | total error <0.7%FS |
| 72 | 0/630°C | Pt1000 | total error <1.0%FS |
| 73 | 0/300°C | Pt1000 | total error <0.7%FS |
| 74 | -150/150°C | Pt1000 | total error <0.7%FS |
| 75 | -60/180°C | Ni100 | total error <0.7%FS |
| 76 | [no function assigned] | | --- |
| 77 | -60/180°C | Ni1000 | total error <0.7%FS |
| 78 to 79 | [no function assigned] | | --- |
| 80 | -50/50°C | NTC ($R_{25}$=10K, β=3500) | total error <0.7%FS |
| 81 | 0/90°C | NTC ($R_{25}$=10K, β=3500) | total error <1.0%FS |
| 82 | -50/50°C | NTC (44006) | total error <0.7%FS |
| 83 | 0/90°C | NTC (44006) | total error <1.3%FS |
| 84 to 94 | [no function assigned] | | --- |
| 95 | Function 'password' | | --- |
| 96 | Pt100 'Alpha' (01=0.0385, 02=0.0390) | | --- |
| 97 | Factory default configuration | | --- |
| 98 | Firmware version | | --- |
| 98 to 99 | [no function assigned] | | --- |
| --- | Exit the menu and discard changes | | --- |

## Configuration system

1. Remove the output signal terminal
2. Open the front cover
3. Configure the instrument
4. Close the front cover
5. Place the output signal terminal