UIM05 MULTIFUNCTION DIGITAL AND ANALOG I/O MODULE

UIM05: 20 digital inputs including
4 multifunction counter/timer channels
12 digital outputs
8 single-ended (or 4 differential) analog inputs for voltage and current measurement
1 PT100 (RTD) input for temperature measurement or for cold junction compensation of thermocouples
4 analog (voltage or current) outputs

The UIM05 is a hardware module you can easily plug into an existing UniOP MMI. The UIM05 is a highly flexible SW-programmable module extending your MMI applications.

Specifications

DIGITAL INPUTS

Description	Specifications
Input channels	20 digital optoisolated (industrial standard) source active high (+24VDC) inputs. All inputs are internally connected to 0VDC of power supply.
Input voltage range	12÷30VDC (min 3mA), 35VDC max for 500 ms
ON-state voltage/current	12÷30VDC (min 3mA) 6mA @ 24VDC, 9mA @ 30VDC
OFF-state voltage/current	6VDC max, 1mA
Input impedance	3K3
Input filter delay max	200 ns for E input, 50 μs for S input (see note below)
Isolation	1500 Vrms
Connector type	MINI-COMBICON plugs 3.5mm-8 contacts (two piece terminal blocks) MC 1.5/8 ST 3.5

Note on input filter delay

The encoder, counter and frequency inputs are digital ones with lower filter delay (the other characteristics are the same as described in the above table). Each digital input can be used as a standard, encoder or counter/timer one. Refer to the table on the right for the input filter delay.

Input type/input filter delay	Input list
E/200 ns	IN0, IN1, IN4, IN5, IN8, IN9, IN12, IN13
S/50 μs	IN2, IN3, IN6, IN7, IN10, IN11, IN14, IN15, IN16, IN17, IN18, IN19

ENCODER CHANNELS

Description	Specifications
Encoder channels	4 (Phase A, Phase B, Zero encoder and Machine zero index pulse inputs per channel). All inputs are internally connected to 0VDC of power supply.
A & B & Z & M channel inputs	IN0 & IN1 & IN2 & IN3, IN4 & IN5 & IN6 & IN7, IN8 & IN9 & IN10 & IN11, IN12 & IN13 & IN14 & IN15
Input frequency	1 MHz max
Pulse width	500 ns min
Count range	32 bit

COUNTER INPUTS

Description	Specifications
Counter channels	4 (pulse and gate input per channel). All inputs are internally connected to 0VDC of power supply. The gate input enables the count of input pulses; the count could be enabled only by SW (so the gate input is available as a general digital input)
Pulse & gate input pairs	IN0 & IN1, IN4 & IN5, IN8 & IN9, IN12 & IN13
Input frequency	1 MHz max
Pulse width	500 ns min
Count range	32 bit

FREQUENCY INPUTS

Description	Specifications
Frequency channels	4 (one input per channel). All inputs are internally connected to 0VDC of power supply.
Frequency inputs	IN0, IN4, IN8, IN12
Input frequency	20KHz max, 1 Hz min
Pulse width	50 μs min
Accuracy	0.005%

DIGITAL OUTPUTS

Description	Specifications
Output channels	12 digital source type optoisolated outputs with feedback of output driver fault status.
Output voltage	12÷30VDC
Output current	0.5A, 1.4A max (protection threshold)
Output delay time	150 μs max
Output protection	Overcurrent and overtemperature protected driver
Isolation	1500 Vrms
Connector type	MINI-COMBICON plugs 3.5mm – 8 contacts (two piece terminal blocks) MC 1.5/8 ST 3.5

ANALOG INPUTS

Description	Specifications
Input channels	4 multifunction analog not isolated input channels. All analog common inputs (COM) are internally connected to M pin of panel supply connector.
Input or measurement type	Voltage input Current input Temperature measurement (various types of thermocouples or PT100 RTD) with incorporated external cold junction compensation
A/D resolution	12 bits
Accuracy @ 25 °C	0.1%
Connector type	MINI-COMBICON plugs 3.5mm – 8 contacts (two piece terminal blocks) MC 1.5/8 ST 3.5
Voltage input type	Single-ended (up 8 inputs) or differential configuration (up 4 inputs)
Voltage input range	Bipolar (± 100mV, ± 1V, ± 5V, ± 10V) Unipolar (0 ÷ 100mV, 0 ÷ 1V, 0 ÷ 5V, 0 ÷ 10V)
Voltage input linearity error	0.1%
Voltage input accuracy	**Bipolar (±100mV) or unipolar (0÷100mV): 0.1% F.S.** **Bipolar (±500mV) or unipolar (0÷500mV): 0.2% F.S.** **Bipolar (±1V) or unipolar (0÷1V): 0.1% F.S.** **Bipolar (±5V) or unipolar (0÷5V): 0.1% F.S.** **Bipolar (±10V) or unipolar (0÷10V): 0.1% F.S.**
Voltage input absolute maximum ratings	±15V (AGND referenced)
Current input type	4 differential ones with external supply transmitter
Current input range	0 ÷ 20mA or 4 ÷ 20mA
Current mode input impedance	**47 Ω**
Voltage mode input	> 10 MΩ
Accuracy	0.1%
Current input linearity	0.1%
Current input absolute maximum ratings	±15V (AGND referenced)
Thermocouple inputs	4 with tested break condition
Thermocouple types	E (-270/1000°C) J (-210/760°C) K (-270/1370°C) R (0/1768°C) S (0/1768°C) T (-270/400°C)
Cold Junction Compensation	External via dedicated PT100 input (see note below)
PT100 (RTD) input	4 for two or three wires configuration (in two wires configuration, 4 inputs remain free for single-ended measurements); break or short circuit detected
Supply	Local **1.2** mA

Measurement temp. range	-100°C÷850°C
PT100 accuracy @ 25 °C There are 4 selectable ranges for resistor measurements.	**Range 1: 0÷157Ohm, 0.1% accuracy** **Range 2: 0÷530Ohm, 0.1% accuracy** **Range 3: 0÷1020Ohm, 0.1% accuracy** **Range 4: 0÷8800Ohm, 0.1% accuracy**
Connector type	MINI-COMBICON plugs 3.5mm – 8 contacts (two piece terminal blocks) MC 1.5/8 ST 3.5

PT100 (RTD) INPUT

This input is dedicated for thermocouple cold junction compensation. The characteristics of this input are the same of PT100 one described in the above table.

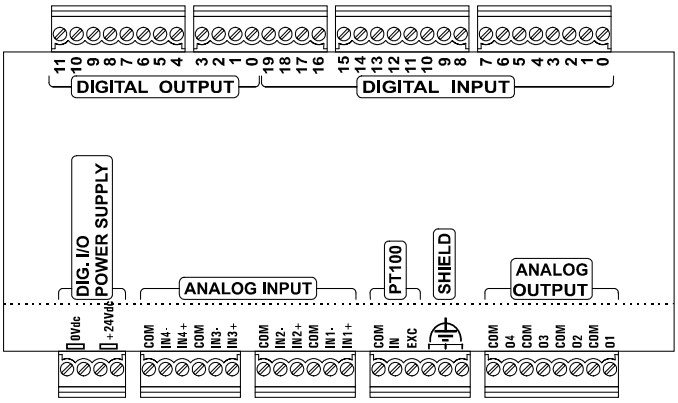
ANALOG OUTPUTS

Description	Specifications
Output channels	4 analog output not isolated channels (voltage or current output).
Resolution	12 bit
Output voltage type	Single-ended
Output voltage range	±10VDC
Output voltage load impedance	1K minimum
Output voltage load capacitance	10nF max
Output voltage linearity error	0.15%
Output current type	Current source
Output current range	0÷20mA or 4÷20mA
Output current load impedance	470 Ω max
Output current linearity error	0.2%
Connector type	MINI-COMBICON plugs 3.5mm – 8 contacts (two piece terminal blocks) MC 1.5/8 ST 3.5

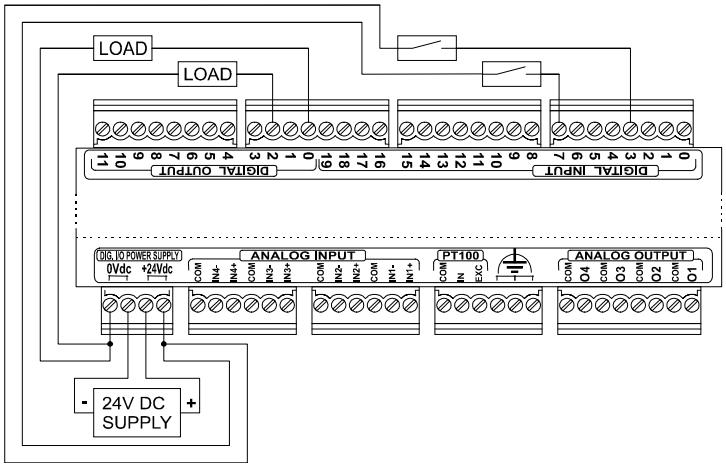
ENVIRONMENTAL CONDITIONS

Description	Specifications
Operating Temperature Storage Temperature Operating Humidity	0÷50 °C -20÷70 °C 5÷85% relative humidity, non condensing

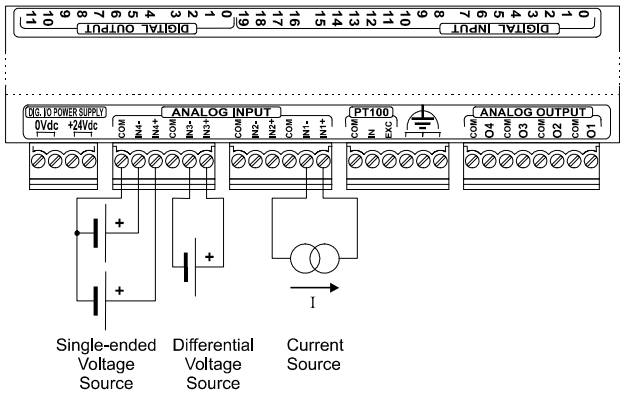
Connectors view



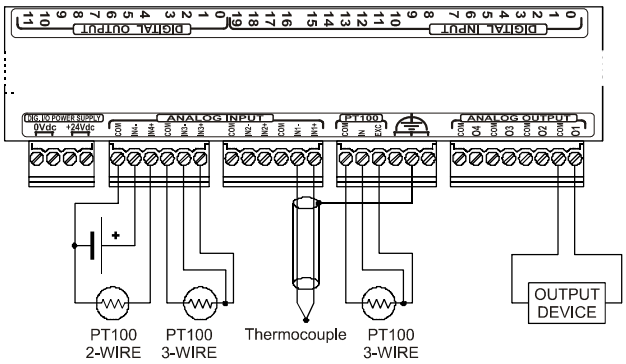
Wiring examples



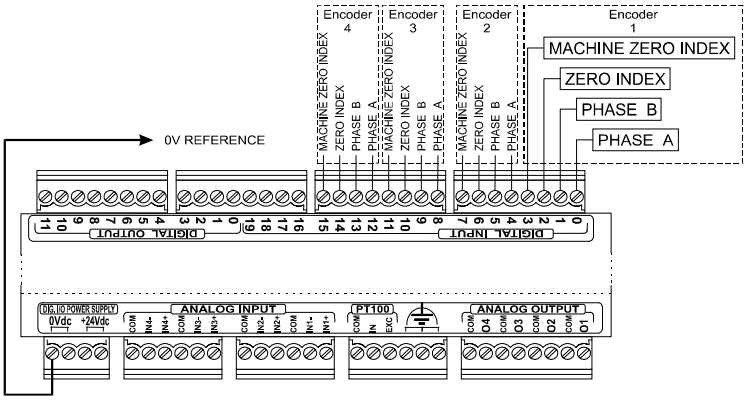
Example: two digital inputs (switches) and two digital outputs connection.



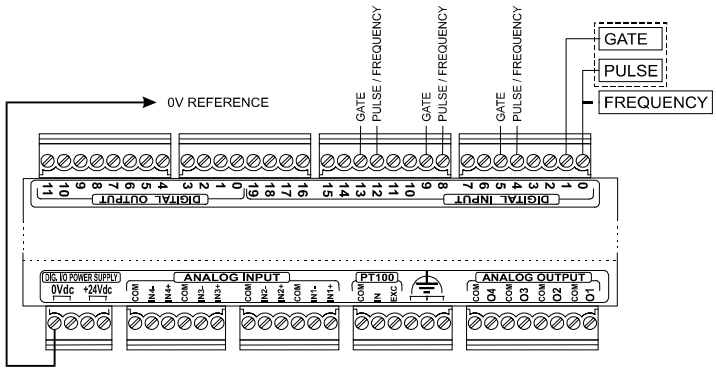
Example: two single-ended voltage sources on the same channel (IN3+, IN3-, COM), one differential voltage source (IN2+, IN2-), one current source (IN0+, IN0-).



Example: a 2-wire PT100 and a single-ended voltage source on the same channel (IN3+, IN3-, COM), a 3-wire PT100 (IN2+, IN2-, COM), a shielded thermocouple (IN0+, IN0-), a 3-wire PT100 (EXC, IN, COM dedicated inputs for cold junction



Example: logic connection of 4 encoder modules. The encoder modules must be 24V powered (connect 0V reference of the encoder to the 0V of the UIM05 power supply).



Example: counter inputs (pulse and gate) and/or frequency inputs (frequency) logic connection. The external modules must be 24V powered (connect 0V reference of the external module to the 0V of the UIM05 power supply).

Installing the I/O Module

Tools: crosshead screwdriver (diameter 4 mm), screwdriver (tip 4mm), wrench 7 mm.

The mounting procedure for the module is the following:

1) Turn off the operator panel and remove all cables.
2) Unscrew (but not remove) by crosshead screwdriver the four screws A, B, C, D.
3) Remove the rear cover.
4) Remove permanently the aluminium heatsink where is available.
5) Insert the UIM05 module
6) Fix the UIM05 module with the two screws E and F.
7) Plug the UIM05 internal flat cable connector in to the red connector and make sure they are properly latched.
8) Remove two side protection from the steel rear box.
9) Replace the rear cover, and fix the screws A, B, C, D.
10) Stick the labels indicating the UIM05 pins assignment.