UIM06 MULTIFUNCTION DIGITAL AND ANALOG I/O MODULE

UIM06: 20 24Vdc digital inputs including
4 multifunction encoder, counter/timer channels
20 24Vdc digital outputs
8 single-ended (or 4 differential) analog inputs for voltage and current measurement
2 analog (voltage or current) outputs

The UIM06 is a hardware module you can easily plug into an existing UniOP HMI. The UIM06 is a highly flexible SW-programmable module extending your HMI 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	15÷30VDC (min 3mA), 35VDC max for 500 ms
ON-state voltage/current	15÷30VDC (min 3mA) 6mA @ 24VDC, 9mA @ 30VDC
OFF-state voltage/current	6VDC max, 1mA
Input impedance	3K3
Input filter delay max	200 ns for ENC input, 50 μs for STD input
Isolation	1500Vrms
Connector type	Flat cable 26 contacts connector male 2.54mm

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	1Mhz max
Pulse width	500nS 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	1Mhz max
Pulse width	500nS 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	1Hz to 20Khz
Pulse width	50uS min
Accuracy	0.005%

DIGITAL OUTPUTS

Description	Specifications
Output channels	20 digital source type optoisolated outputs with feedback of output driver fault status (groups of eight).
Output voltage	12…35Vdc
Output current	350mA, 1.4A max (protection threshold)
Output delay time	150uS
Output protection	Overcurrent and overtemperature protected driver
Isolation	1500Vrms
Connector type	Flat cable 26 contacts connector male 2.54mm

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 TC or PT100 RTD)
A/D resolution	14 bits
Connector type	MINI-COMBICON plugs 3.5mm – 6 contacts (two piece terminal blocks) MC 1.5/6 ST 3.5
Voltage input type	Single-ended (up 8 inputs) or differential configuration (up 4 inputs)
Voltage input range (note 4)	Bipolar (± 100mV, +-500mV, ± 1V, ± 5V, ± 10V) Unipolar (0 ÷ 100mV, 0 ÷ 200mV, 0 ÷ 1V, 0 ÷ 5V, 0 ÷ 10V)
Voltage input accuracy @ 25°C (note 1-2-4)	0.1%
Voltage input ranges	**Bipolar (±100mV) or unipolar (0÷100mV): 0,1 F.S.** **Bipolar (±500mV) or unipolar (0÷500mV): 0,1 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	2 differential ones with external supply transmitter
Current input range	0 ÷ 20mA or 4 ÷ 20mA
Current Mode Input impedance	47 Ω typ.
Voltage Mode Input Impedance	>10 MΩ
Current input Accuracy @ 25 °C (note 1-2-3)	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	Provided via one of generic inputs in PT100 mode
PT100 (RTD) input	4 for two, three or four wires configuration (in two wires configuration, 4 inputs remain free for single-ended measurements); break or short circuit detected
RTD Supply	1 mA
Measurement temp. range	-100°C÷300°C
PT100 accuracy @ 25 °C There are 2 selectable ranges for resistor measurements. (note 1-2-3)	-100÷300°C +/- 0,2 °C -200÷850°C +/- 0,5 °C
Connector type	MINI-COMBICON plugs 3.5mm – 6 contacts (two piece terminal blocks) MC 1.5/8 ST 3.5

Note (1): Accuracy is defined with number of Average Samples 256.

UIM06 integrates fully programmable Average filter. The user can program the number of Samples and the Filter Clipping value in order to trim the response time.
If analog input variation is bigger than clipping value the response time is fast.

Note (2): Analog measure drift for current input and PT100 type for temp. variation within 20 °C : max. 0,05% FS

Note (3): After UIM06 Power-on before any sensor calibration wait 5 minutes in order to get stable instrument measure

Note (4): Analog measure drift for voltage input type temp. variation within 20 ° C : max. 0.2% FS

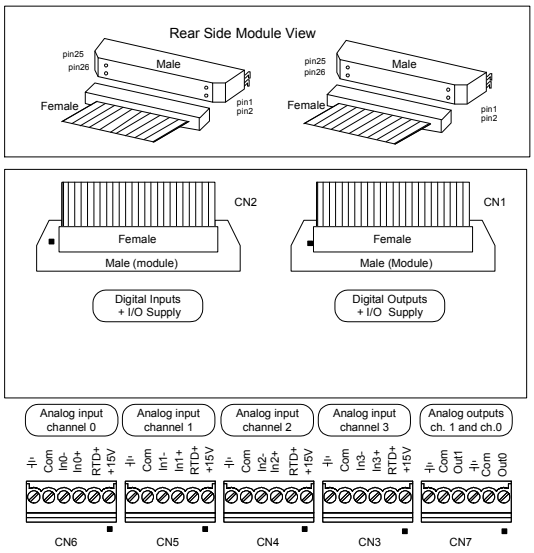
ANALOG OUTPUTS

Description	Specifications
Output channels	2 analog outputs not isolated channels (voltage or current output) high side (referenced to AGND).
Resolution	12 bit
Output voltage type	Single-ended
Output voltage range	±10VDC
Output voltage load impedance	2,5KΩ
Output voltage linearity error	0.1%
Output current type	Current source
Output current range	0÷20mA or 4÷20mA
Output current load impedance	470 Ω max
Output current linearity error at 25°C	0.1%
Connector type	MINI-COMBICON plugs 3.5mm – 6 contacts (two piece terminal blocks) MC 1.5/6 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



CN2: Digital input connector

In_0	1	2	In_1
In_2	3	4	In_3
In_4	5	6	In_5
In_6	7	8	In_7
In_8	9	10	In_9
In_10	11	12	In_11
In_12	13	14	In_13
In_14	15	16	In_15
In_16	17	18	In_17
In_18	19	20	In_19
-(24VDC)	21	22	+(24VDC)
+(24VDC)	23	24	+(24VDC)
+(24VDC)	25	26	+(24VDC)

CN1: Digital output connector

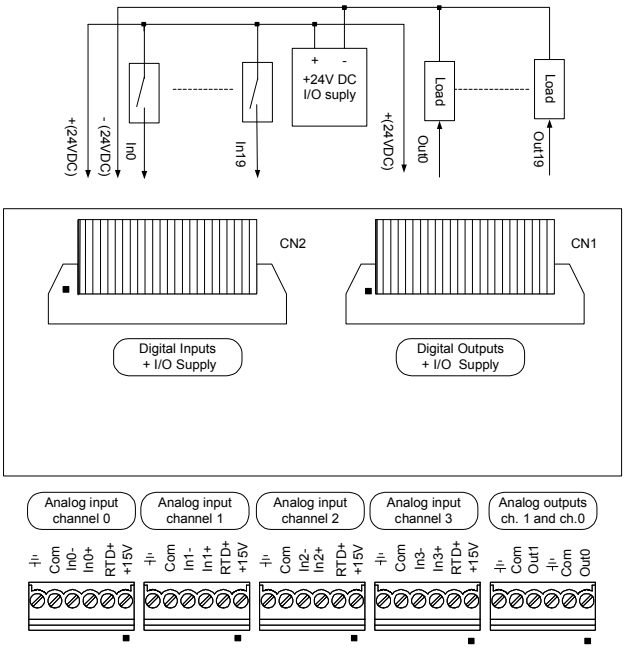
Out_0	1	2	Out_1
Out_2	3	4	Out_3
Out_4	5	6	Out_5
Out_6	7	8	Out_7
Out_8	9	10	Out_9
Out_10	11	12	Out_11
Out_12	13	14	Out_13
Out_14	15	16	Out_15
Out_16	17	18	Out_17
Out_18	19	20	Out_19
+(24VDC)	21	22	+(24VDC)
+(24VDC)	23	24	+(24VDC)
+(24VDC)	25	26	+(24VDC)

Wiring examples

Connection for Digital input and outputs:

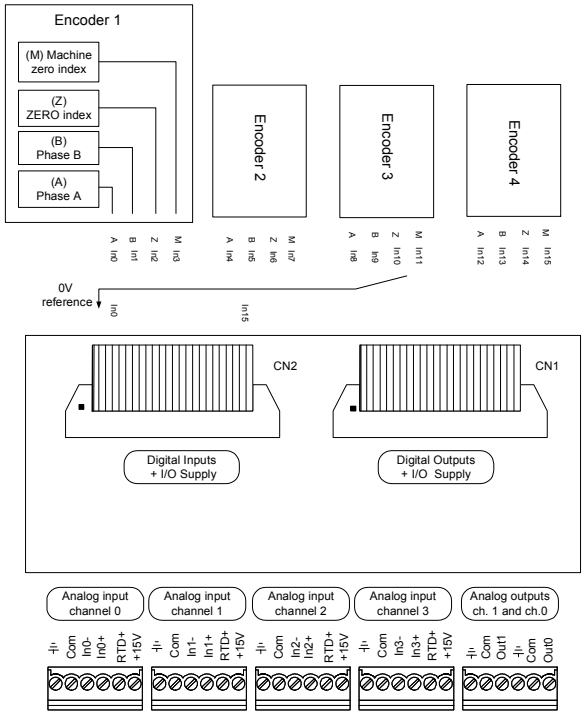
Example: Drawing below connection for digital inputs and digital outputs (see CN1 and CN2 pin out for detailed pin position).

Note: Supply +24V DC at input connector (CN2) is used only to provide more current for +24V DC supply for digital outputs. If digital outputs are not used, connection +24VDC at CN2 is meaningless.



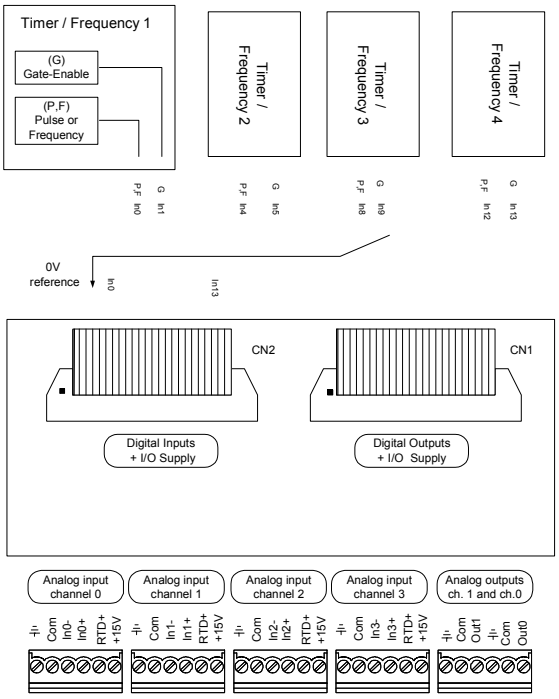
Connection for Encoders:

Example: Drawing below shows connection up to four encoder modules. The encoders are +24VDC supplied -nominal (see in input characteristics for min. and max. values of input signals). Encoder's outputs (single ended) are connected to respective inputs of CN2 (at drawing above see position of inputs, provided for encoder connection). Connect 0V reference of encoder to the 0V of I/O supply (pin signed with –(24VDC) at CN2).

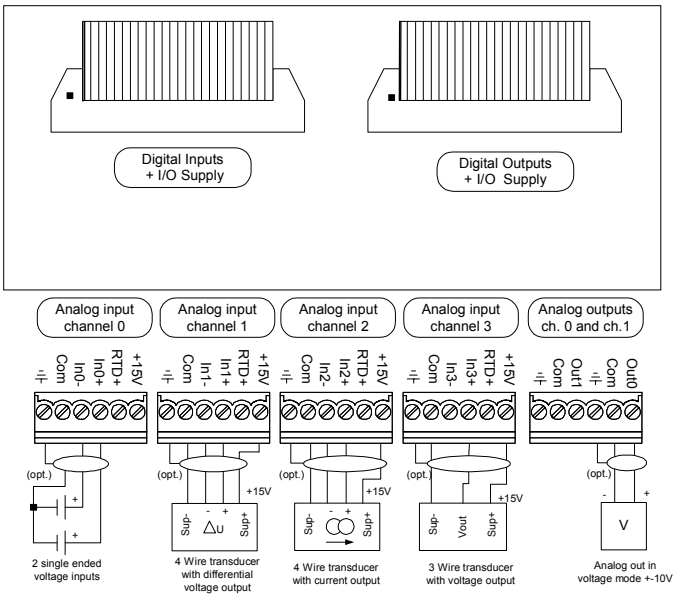


Connection for Counter and Frequency measurement:

Example: Drawing below shows connection for various counter (using Pulse and optionally Gate - enable inputs) and frequency measurement. Inputs are nominally +24V DC (see in input characteristics for min. and max. values). Connect 0V reference of source to the 0V of I/O supply (pin signed with –(24VDC) at CN2).



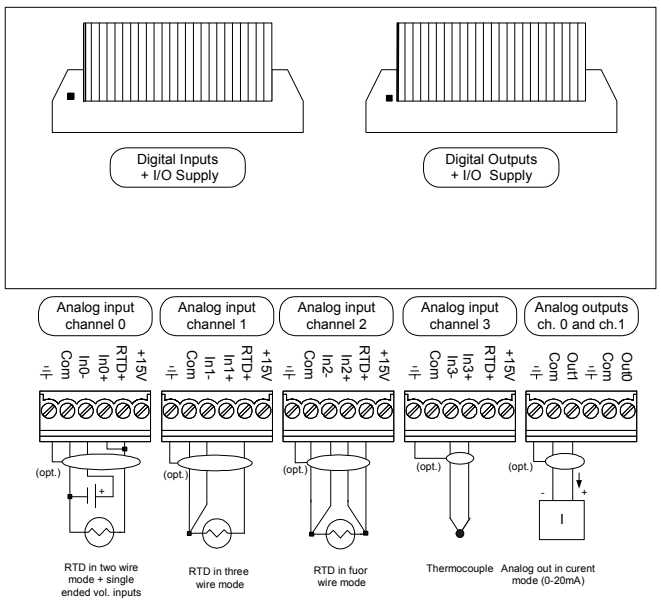
Connection for Analog inputs and outputs:



Example: Drawing above shows connections for:

- Two single-ended voltage sources on the same channel (IN0+, IN0-, COM)
- One differential voltage source (IN1+, IN1- and Supply), used with four wire voltage transducer
- One differential current source input (IN2+, IN2- and Supply), used with four wire current output transducer
- One single-ended voltage source (IN3+, IN3- and Supply), used with three wire voltage output transducer

Connection for Analog inputs and outputs:



Example: Drawing above shows connections for:

- One single-ended voltage source and RTD in two wire connection on the same channel (RTD+, IN0+, IN0-, COM)
- One RTD in three wire connection (RTD +, IN1-, COM)
- One RTD in four wire connection (RTD+, IN2+, IN2-, COM)
- One Thermocouple in differential connection (IN3+, IN3-). One of other inputs in RTD connection should be used for compensation
- One Analog out (Aout1) in current source mode (0-20mA or 4-20mA)

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. (fig.1)
3) Remove the rear cover. (fig.2)
4) Remove permanently the aluminium heatsink where is available.
5) Insert the UIM06 module (fig.3)
6) Fix the UIM06 module with the two screws E and F. (fig.4)
7) Plug the UIM06 internal flat cable connector in to the red connector and make sure they are properly latched. (fig.4)
8) Remove two side protection from the steel rear box. (fig.3)
9) Replace the rear cover, and fix the screws A, B, C, D.
10) Stick the labels indicating the UIM06 pins assignment.(fig.5a – 5b)

Notes:

- This operation can be carried out before or after the units are mounted in their cut-out.
- When UIM06 has to be installed in unit MD01/02/03 type, the unit has to be installed in the cut-out before to replace the rear block (fig.3)

Fig.1

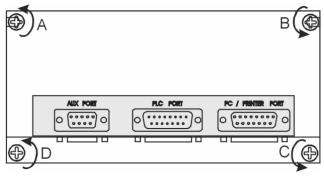


Fig.2

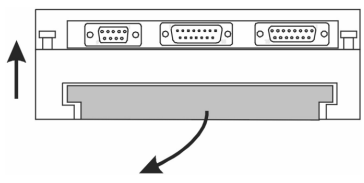


Fig.3

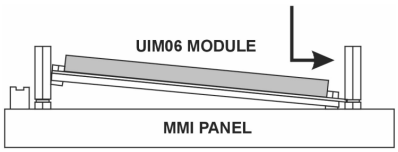


Fig.4

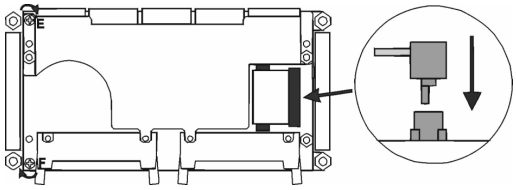


Fig.5a

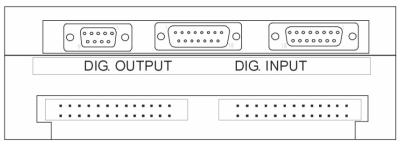


Fig.5b

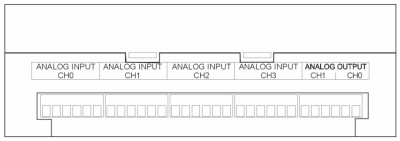


Fig.6