



5040 Single Loop Controller

Advanced. Precise. Compact

Masibus 5040 is much more than a controller capable for complex and demanding process control applications. It has accessibility of both hardware and software features in compact size making it a highly configurable product, offering many features found in costly programmable controllers.

5040 accepts all analog process inputs like Thermocouple, RTD, Current and Voltage as well as 4 digital inputs, remote set point and feedback resistance input. A comprehensive controlling can be implemented using four relays, four digital outputs and two analog output with any of required control algorithm like auto-tune PID, On-off or Motorized valve control.

5040 offers field configurable Control outputs comprising of Relay o/p, SSR o/p & Analog o/p. It has total 4 Relay o/p providing a combination of alarm control output based on application requirement.

5040 offers 4 nos of open collector digital o/p used for various Alarm diagnostic o/p such as PV Input open, RS input open and VPFB Input open

Using RS485 interface desired parameters configuration and status can be communicated to SCADA/ PLC/ DCS applications. Important process values can be re-transmitted as any standard current or voltage signal.

It has Fail-safe Design protecting the process in case of system malfunctioning

Features

- Universal Input selection
- Universal output including valve positioner output
- Autotune PID with Ratio control
- Fast Loop response time of 250mSec
- 4 Relay and 4 Digital outputs for Control, Alarms and events
- 4 Digital Inputs for remote operations
- 18 Alarm types
- Auto/Manual selection with bumpless transfer
- Auto-tune PID, On-Off or Motorised Valve control
- Analog outputs for control/retransmission
- RS485 port with Modbus RTU protocol

Applications

- Heat treatment furnaces
- Reheat furnaces
- Ceramic Kilns
- Glass Industry
- Flow/ Pressure control
- Distillation and Reactor control in Chemical plants
- Water and waste water control
- Ratio Control

TECHNICAL SPECIFICATIONS

Input	
Input 1: PV Input	
Input Type	Thermocouple (E, J, K, T, B, R, S, N) RTD (Pt100), Current, Voltage
Input Range	Refer Table-1
Accuracy	TC, RTD: $\pm 0.1\%$ of F.S $\pm 1^\circ\text{C}$ Current, Voltage: $\pm 0.1\%$ of F.S ± 1 Count
ADC Resolution	17 bits
Display Resolution	0.1°C / 1 Count
Sampling Rate	250 msec
CJC Error	$\pm 2.0^\circ\text{C}$ Max
Sensor Burnout current	0.25uA
RTD excitation current	1mA Max
NMRR	> 40dB
CMRR	> 120dB
Temp-co	< 100ppm/°C
Input Impedance	> 1M Ω
Max Voltage	20VDC

Input 2: RSP Input	
Input Type	4 to 20 mA, 0-20mA, 0-5V, 1-5V
Sampling Rate	750 msec
Accuracy	$\pm 0.1\%$ FS
Input Impedance	1 M Ohm

Input- 3: ZV Input	
Input Type	Potentiometer 100 to 2K Ohm
Resolution	0.1%

Digital Input	
Input Type	4, Potential free or open collector
Rating	24VDC @ 5mA Max

Display & Keys	
Process Value	0.56" Four-digit 7 segment Red LED
Set Value	0.4" Four-digit 7 segment Green LED
Manipulated Val/ZV	20 Segment Orange LED
Status Indication	Four Red LED's for Relays, alarm, Auto/Manual, Set point selection, Valve Position Feedback, Green LEDs for Communication
Keys	Menu, Escape / A/M, Shift, Increment

Output	
Control Output (Field Programmable)	
Manual offset in P mode	$\pm 50\%$ of P band
Proportional band	0.1 to 999.9
Integral time	0 to 1000 sec
Derivative time (Rate)	0 to 250 sec
Cycle time	1 to 250 sec
Auto-tuning	Yes
Hysteresis	1 to 250 (on/off mode)

Relay Output	
Relays	1 or 2 (2 for forward/ reverse motor control type)
Type & Rating	1 Change over (C, NO, NC), 5A @ 230V AC / 30V DC
Mode	PID or ON/OFF control (field selectable)

SSR Output	
Rating	11VDC @ 20mA
Resolution	10 msec

Analog Output	
Output Signal	4-20 mA@500 Ω Max
Accuracy	$\pm 0.25\%$ of FS

Retransmission Output	
Number of Output	1 (Field Programmable, selectable for PV, MV or ZV)
Output Signal	0/4-20mA @ 500 ohm Max; 0/ 1-5VDC, 0-10 V DC.@ 3 K ohms min
Output Accuracy	$\pm 0.25\%$ of span

Alarm Output	
Relay Output	
Relays	3 or 4 (if control o/p is pulse / Analog) 2 (if O/P is VPFB or VPNA)
Type & Rating	1 Change over (C, NO, NC), 5A @ 230V AC / 30V DC

Digital Output	
No & Type of Output	4 Open Collector o/p
Rating	24 VDC @ 50mA

Communication Output	
Interface	RS485 (2 Wire)
Protocol	Modbus RTU
Baud Rate (bps)	9600, 19200

Transmitter Power Supply	24VDC ($\pm 1\text{V}$) @30mA
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Power Supply	
Standard	85-265V AC/110-300VDC
Optional	18-36VDC
Power consumption	<15 VA

Isolation (Withstanding voltage)

- Bet[†] primary terminals* and secondary terminals**: **At least 1500V AC for 1 minute**
- Bet[†] primary terminals* and grounding terminal: **At least 1500 V AC for 1 minute**
- Bet[†] grounding terminal and secondary terminals**: **At least 1500 V AC for 1 minute**
- Bet[†] secondary terminals**: **At least 500 V AC for 1 minute**

* Primary terminals indicate power terminals and relay output terminals.

** Secondary terminals indicate analog I/O signal and Communication O/P.

Insulation resistance: 50M Ω or more at 500 VDC between power terminals and grounding terminal

Physical	
Dimension (in mm)	96(H) x 96(W) x 110(D)
Panel cut out (in mm)	92.5(H) x 92.5(W)
Weight (gms)	500 (Approx)
Enclosure Material	92.5(H) x 92.5(W)
Enclosure Protection	IP20 (except terminals)
Terminal Cable Size	2.5mm ²
Accessories	Two mounting clamps

Environmental	
Operating Temperature	0 to 55°C
Storage Temperature	0 to 80°C
Humidity	20 to 95 %RH non-condensing

TECHNICAL SPECIFICATIONS

Table 1: Display Range

Input Type		Ranges
Thermocouple	E	-200 to 1000°C
	J	-200 to 1200°C
	K	-200 to 1370°C
	T	-200 to 400°C
	B	450 to 1800°C
	R	0 to 1750°C
	S	0 to 1750°C
	N	-200 to 1300°C
RTD	Pt-100	-199.9 to 850.0°C
Linear	-10 to 20mV	-1999 to 9999
	0 to 75mV	
	0 to 100mV	
	0.4 to 2V, 0 to 2V	
	4 to 20mA, 0 to 20mA (Ext 100Ω)	
	0 to 5V	
	1 to 5V	
	0 to 10 V	

ORDERING CODE

Model	Inputs	Aux Power Supply	Control Ouput	Rx Output	DI/ DO
5040	X	X	X	X	X
	1 E	U1 85-260VAC/ 110-300VDC	1 Relay	N None	N None
	2 J	U2 18-36VAC	2 SSR	1 4-20mA	Y Yes
	3 K		3 Analog	2 0-20mA	
	4 T		4 F/R	3 1-5V	
	5 B			4 0-10V	
	6 R				
	7 S				
	8 N				
	9 Pt-100				
	A -10-20mV				
	B 0-75mV				
	C 0-100mV				
	D 0.4-2V				
	E 0-2V				
	F 0-5V				
	G 1-5V				
H 0-10V					

X – Specify from table