OP650-V01

selec

TWIX-2
Operating Instructions

48mm x 96mm

FEATURES

- PLC with built-in HMI
- Configurable LED display
- RS485 based communication with MODBUS RTU protocol

SPECIFICATIONS

Display	Top Red – 8 digits (7 segment)	
	Bottom Green – 6 digits (7 segment)	
	8 LED's (4 Red + 4 Green)	
No. of Keys	5 (4-user configurable)	
Supply Voltage	230V AC (90 - 270 VAC)	18V - 30V DC
Sensor Supply (SS)	12V, 50mA	

FUNCTIONAL SPECIFICATIONS (CPU)

Programming Language	Windows based user friendly SELPRO software for ladder logic programming.
Memory	Program Memory : 240 kB Data Memory : 32 kB EEPROM Memory : 2 kB VAR_IN-OUT & VAR_OUTPUT TYPE Variable Max 120 bytes retention
Scan Time	Typical 1ms
Function Blocks	Timer On delay, Timer Off delay, Pulse Timer, Special Timer, Up/Down Counter, PID control etc.
Memory Retention	10 Years

DIGITAL INPUTS

*1 = 90° Phase shift signals

Number of Digital Inputs		8 (including 2 inputs(0-10Vdc) & 2 Fast Input)
Operating Modes (user configurable)		Unidirectional / Bidirectional / Quadrature / Dual Unidirectional / None
Operating Range		5 ~ 30V DC
Input current		3 mA @10V
Action Level	Level 1 ➡ Level 0	<3V DC
	Level 0 ➡ Level 1	≥5V DC
Response Time	Digital Input mode	Typical 1ms (based on ladder scan time)
	Fast Input mode	100µsec
Input Impedance		7.5 kΩ
Debounce Time		0 ~ 255 ms (Default = 10 ms)
Maximum counting Frequency		Normal Input : 30 Hz Fast Input : 5 KHz
Protection against polarity Inversions		Yes

Channel	DI	MODE				
		UNI	BI	QUAD	DUAL UNI	None
FC0	I0	Rate Totalizer	Rate Totalizer	1st input*1	Rate Totalizer	Digital Input
	I1	Digital Input	Direction	2nd input*1	Totalizer	Digital Input

RELAY OUTPUTS

Number of Relay Outputs	5
Output Type	NO contact type
Output Current	5A @28VDC (Resistive), 5A @240VAC (Resistive)
Response Time	10ms
Life Expectancy	Mechanical -: 2 x 10^7 ops Electrical -: 1 x 10^5 ops
Isolation	No
Existence of common points between channels	2 COM for 5 Relay Outputs

ANALOG INPUTS

	TC Type	RTD Type	Voltage	Current
Number of channels	2		2	2
Sensor type	J, K, T, R, S, C, E, B, N, L, U, W, PLATINEL II, MILLIVOLT (-5 to 65mV)	PT100	0-10V	0-20mA
Type of input	Non-differential			
Temperature Resolution	0.1°C		--	
Digital Resolution for MILLIVOLT	12 bits	NA	12 bits	
Input impedance in signal range	560 kΩ	750 kΩ	330 kΩ	100 Ω
Analog input error at 25°C	0.25% of full scale ±1°C	0.1% of full scale ±1°C	0.25% of full scale	
Conversion time	100 ms			
Protection against polarity inversion	Yes	NA	Yes	Yes
Channel isolation	No			

ANALOG OUTPUT

Number of channel	1
Output Type	**Voltage** - 0-10 V **/ Current** - 0-20 mA (selectable via S/W)
Resolution	14 bits
Conversion Time	10 msec.
Linearity Error	0.1%

COMMUNICATION

Communication Port	RS485 Slave
Communication Protocol	MODBUS RTU
Baud Rate	9600, 19200, 38400, 57600, 115200 (user configurable via software and hardware) Default = 19200 (Preferred ladder downloading at 19200)

ENVIRONMENTAL CONDITIONS

Operating Temperature	0 to 55°C
Storage Temperature	-20 to 70°C
Humidity (non-condensing)	95%
Mounting	Panel Mounted
Weight	Approx. 240 gms

SAFETY PRECAUTIONS

This manual is meant for personnel involved in wiring, installation, operation and routine maintenance of the equipment.
All safety related conditions, symbols and instructions that appear in this operating manual or on the equipment must be strictly followed to ensure operator and instrument safety. Any misuse may impair the protection provided by the equipment.

CAUTION : Read complete instructions prior to installation and operation of the unit.
CAUTION : Risk of electric shock.

INSTALLATION INSTRUCTIONS

CAUTION

1. This equipment, being built-in-type, normally becomes a part of the main control panel and the terminals do not remain accessible to the user after installation.
2. Conductors must not come in contact with the internal circuitry of the equipment else it may lead to a safety hazard that may endanger life or cause electrical shock to the operator.
3. Circuit breaker or mains switch must be installed between the power source and supply terminals to facilitate power 'ON' or 'OFF' function.
4. The equipment shall not be installed in environmental conditions other than those specified in this manual.
5. Since this equipment forms part of the main control panel, its output terminals get connected to the host equipment. Such equipment shall also comply to EMI / EMC and safety requirements like CE standard procedure.
7. Thermal dissipation of equipment is met through ventilation holes provided on housing of equipment. Obstruction of these ventilation holes may lead to a safety hazard.
8. The output terminals shall be loaded strictly as per the values / range specified by the manufacturer.

ELECTRICAL PRECAUTIONS DURING USE

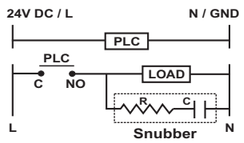
Electrical noise generated by switching of inductive loads can create momentary disruption, erratic display, latch up, data loss or permanent damage to the instrument.

To reduce noise :

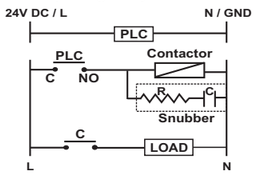
Use of Selec make Snubber across load is recommended.
Snubber Part no. : SNUBBER
NOTE : Below mentioned diagram is applicable only for 230V relay outputs.

Typical Connections For Loads :

For load current < 0.5A



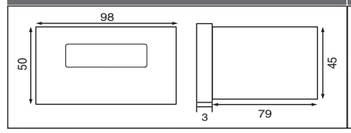
For bigger loads use interposing relay / contactor



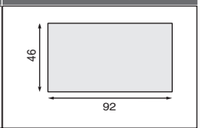
NOTE : Use snubber as shown above to increase life of internal relay.
B) Use separate shielded wires for inputs.

MECHANICAL INSTALLATION

Outline Dimensions (in mm)



Panel Cutout (in mm)



For installing the controller
1. Prepare the panel cutout with proper dimensions as shown above.
2. Fix the unit into the cutout. Insert the clamp from both sides and tighten the screws.

CAUTION

The equipment in its installed state must not come in proximity to any heating sources, caustic vapors, oils, steam or other unwanted process by products.

EMC Guidelines :

1. Use proper input power cables with shortest connections and twisted type.
2. Layout of connecting cables shall be away from any internal EMI source.

MAINTENANCE :

1. To avoid blockage of ventilation holes, clean the equipment regularly using a soft cloth.
2. Do not use Isopropyl alcohol or any other organic Solvents for cleaning.

WIRING INSTRUCTIONS

⚠ CAUTION

1. To prevent risk of electric shock, power supply to the equipment must be kept OFF while wiring.
2. Terminals and electrically charged parts must not be touched when the power is ON.
3. Wiring shall be done strictly according to the terminal layout provided in the operating manual.
4. To eliminate electromagnetic interference use short wire with adequate ratings and twists of equal size.
5. The power supply connection cable must have a cross section of 1sq.mm or greater and insulation capacity of a t least 1.5KV.

FUNCTIONAL DETAILS

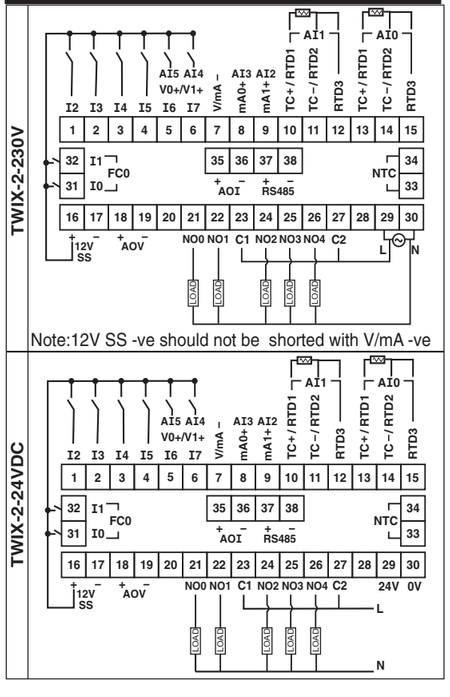
TWIX-2-230V / TWIX-2-24VDC is a PLC with built in HMI. The user can configure the product using SELPRO software.

SELPRO has two sections :

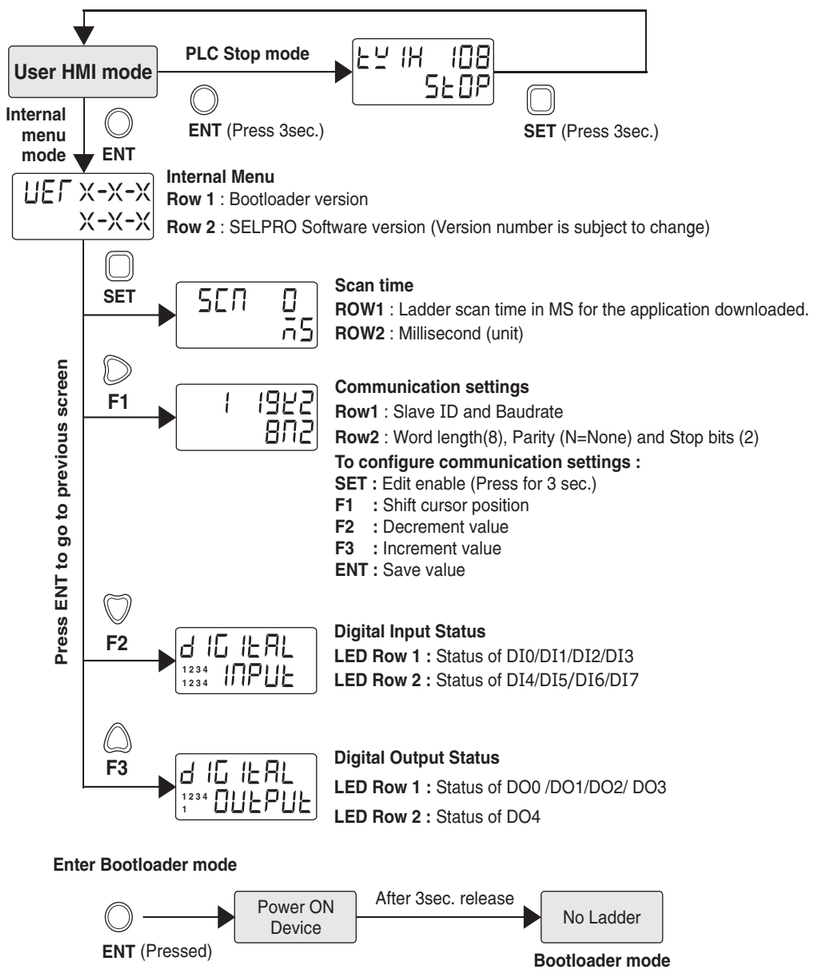
1. Ladder logic programming section
2. Selec Machine Interface, used for configuration of HMI.

For details of the software, please refer to the software user manual.

WIRING DIAGRAM



MENU DESCRIPTION



Internal Menu
Row 1 : Bootloader version
Row 2 : SELPRO Software version (Version number is subject to change)

Scan time
ROW1 : Ladder scan time in MS for the application downloaded.
ROW2 : Millisecond (unit)

Communication settings
Row1 : Slave ID and Baudrate
Row2 : Word length(8), Parity (N=None) and Stop bits (2)
To configure communication settings :
SET : Edit enable (Press for 3 sec.)
F1 : Shift cursor position
F2 : Decrement value
F3 : Increment value
ENT : Save value

Digital Input Status
LED Row 1 : Status of DI0/DI1/DI2/DI3
LED Row 2 : Status of DI4/DI5/DI6/DI7

Digital Output Status
LED Row 1 : Status of DO0 /DO1/DO2/ DO3
LED Row 2 : Status of DO4

ACCESSORIES (To be ordered separately)

ORDER CODE	DESCRIPTION
AC-USB-RS485-02	USB to RS485 cable (2 pin open wire)

? SERVICE DETAILS

This device contains no user serviceable parts and requires special equipment and specialized engineers for repair.
Please contact service center for repair on the following numbers : **Tel. No. :** + 91-7498077172 ;
Email : service@selec.com
NO WARRANTY ON UNIT DAMAGED DUE TO WRONG POWER SUPPLY.

(Specifications are subject to change, since development is a continuous process.)

Selec Controls Pvt. Ltd., India

Factory Address :
EL-27/1, Electronic Zone, TTC Industrial Area, MIDC, Mahape, Navi Mumbai - 400 710, INDIA.
Tel. No. : +91-22-41 418 419/430 I Fax No. : +91-22-28471733
Toll free : 1800 227 353 (BSNL/MTNL Subscribers only)
Website : www.selec.com I Email : sales@selec.com

CALIBRATION CERTIFICATE

Model :- TWIX-2-24VDC

Claimed Accuracy :- For TC :0.25% of full Scale ± 1°C
For RTD :0.1% of full Scale ± 1°C
For V & I :0.5% of full Scale

Traceability :- **50X25**

This Units Has Been verified For All functional parameters mentioned in Operating Instruction.

Analog Parameters [For Applicable Product]

The Calibration of this unit has been verified at the following value for selection channels :-

Analog Input :-	CH0	CH1	CH2	CH3	CH4	CH5
TC						
RTD						
AI						
AV						

NOTE : Analog Input/Analog Output Has Been Verified At the following Value :

Sensor	Calibration Temp(°C)	Display Value(°C)	Sensor	Calibration Value	Display Value
K	35.0	35.0	Voltage (VDC)	0.000	0.000
	700.0	700.0		10.000	10.000
	1350.0	1350.0			
PT100	0.0	0.0	Current (mA)	0.000	0.000
	500.0	500.0		20.000	20.000
	800.0	800.0			

The thermocouple/RTD curves are Linearized in this microprocessor based product , and hence the value interpolated between the readings shown above are also equally accurate, at every point in the curve.

Product Calibration Is Traceable to NABL Standard.
Unit is accepted as accuracy is within the specified limit of claimed accuracy and certifiedis valid up to one year from the date of issue.