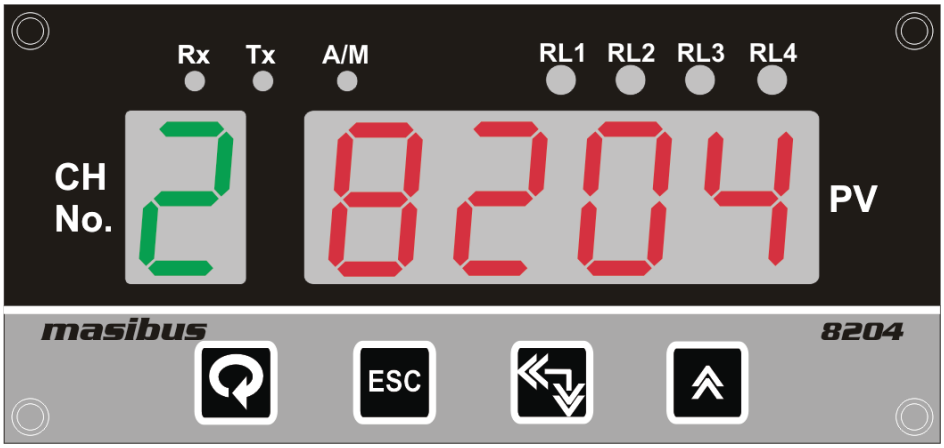
USER MANUAL

8204
4 - CHANNEL SCANNER



Masibus Automation And Instrumentation Pvt. Ltd.
B/30, GIDC Electronics Estate,
Sector-25, Gandhinagar-382044, Gujarat, India
Email: support@masibus.com
Web: www.masibus.com

Contents

masibus
A Sonepar Company

1. Introduction :

Foreword

Thank you for purchasing 8204 universal Scanner. This manual describes the basic functions and operation methods of 8204.Please read through this user's manual carefully before using the product.

Notice

The contents of this manual are subject to change without notice as a result of continuing improvements to the instrument's performance and functions.

Every effort has been made to ensure accuracy in the preparation of this manual. Should any errors or omissions come to your attention, however, please inform MASIBUS Sales office or sales representative. Under no circumstances may the contents of this manual, in part or in whole, be transcribed or copied without our permission.

Trademarks

Our product names or brand names mentioned in this manual are the trademarks or registered trademarks of Masibus Automation and Instrumentation (P) Ltd. (herein after referring to as **MASIBUS**).

Adobe, Acrobat, and Postscript are either registered trademarks or trademarks of Adobe Systems Incorporated. All other product names mentioned in this user's manual are trademarks or registered trademarks of their respective companies.

Checking the Contents of the Package

Unpack the box and check the contents before using the product. If the product is different from that which you have ordered, if any parts or accessories are missing, or if the product appears to be damaged, contact your sales representative.

Product Ordering Code:

The 8204 Scanner unit has a nameplate affixed to the one side of the enclosure. Check the model and suffix codes inscribed on the nameplate to confirm that the product received is that which was ordered.

Model	Suffix code	Optional code	Remarks

List of Accessories

The product is provided with the following accessories according to the model and suffix codes (see the table below). Check that none of them are missing or damaged.

No	Item name	Part number	Qty	Remarks

2. Installation :

How to Install:

Mounting method: Panel mounting

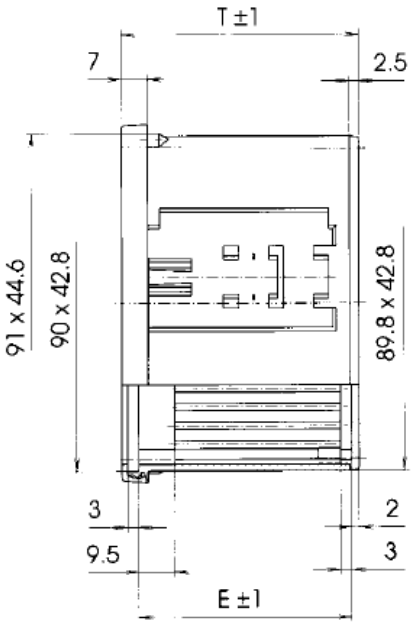
To install the controller, select a location where:

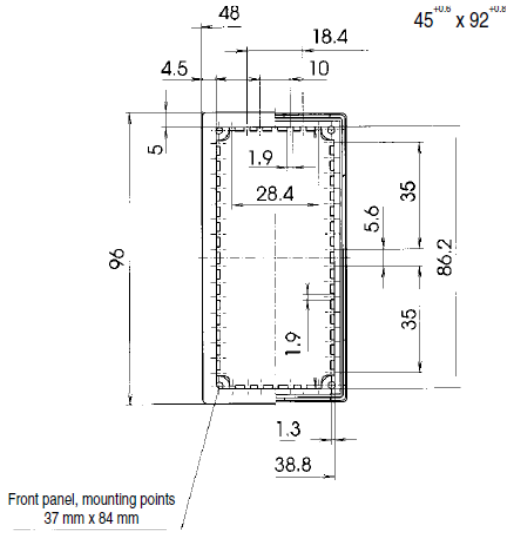
- no one may accidentally touch the terminals
- mechanical vibrations are minimal
- corrosive gas is minimal
- temperature can be maintained at about 25°C to 35°C and the fluctuation is minimal
- no direct radiant heat is present
- no magnetic disturbances are caused
- no wind blows against the terminal board
- no water splashed
- no flammable materials are around

 Turn off the power to the controller before installing it on the panel because there is a possibility of electric shock

masibus
A Sonepar Company

External Dimensions and Panel Cutout Dimensions:





FRONT BEZEL: 48 x 96 mm
PANEL CUTOUT: 45+0.8(H) x 92+0.8(W) mm
DEPTH BEHIND THE PENAL: 130 mm

How to connect wires:

Before carrying out wiring, turn off the power to the controller and check that the cables to be connected are not alive with a tester or the like because there is a possibility of electric shock.

NOTE:

- All wiring must confirm appropriate standards of good practice and local codes and regulations. Wiring must be suitable for Voltage, Current and temperature rating of the system.
- Provide power from a single-phase instrument power supply. If there is a lot of noise in the power line, insert an insulating transformer into the primary side of the line and use a line filter on the secondary side. Do not place the primary and secondary power cables close to each other.
- For thermocouple input, use shielded compensating lead wires for wiring. For RTD input, use shielded wires that have low conductor resistance and cause no significant differences in resistance between the three wires. Do not connect **Terminal Number – 3, 6,9,12** when thermocouple or linear input is selected.
- Use repeater after each set of 32 instruments connected in RS-485 Communication.
- Unused terminals should not be used as jumper points as they may be internally connected, which may cause damage to the unit.

CAUTION:

High voltage transients may occur when switching inductive loads such as some contactors or solenoid valves. Through internal contacts, these transients may introduce disturbances which could affect the performance of the instrument.
For this type of load it is highly recommended that a "snubber" is connected across the normally open contact of the relay switching though load. The snubber recommended consists of a series connected resistor/capacitor (typically **15nF/100 Ohms**). A snubber will also prolong the life of the relay contacts. A snubber should also be connected across the output of a trip output to prevent false triggering under line transient conditions.

masibus
A Sonepar Company

3. Hardware Specification Detail:

Input Specification

NO. OF CHANNEL	4
APPLICABLE STANDARDS	DIN (ITS-90) for Thermocouple and RTD
INPUT TYPE	As specified in Error! Reference source not found.
SAMPLING PERIOD PER INPUT	100mSec for TC and Linear Input, 200mSec for RTD Input.
RESOLUTION	17 bits
BURNOUT DETECTION	TC/RTD/Linear input with sensor connected or not; relay burnout action (Upscale/Downscale)
MEASUREMENT CURRENT	1mA (RTD)
INPUT IMPEDANCE	>1MΩ for thermocouple/ mV/RTD/Volts inputs.
NOISE REJECTION RATIO	• NMRR Normal mode rejection ratio) > 40 dB (50/60 Hz) or more • CMRR (Common mode rejection ratio) >120 dB (50/60 Hz) or more
ALLOWABLE WIRING RESISTANCE FOR RTD	Maximum 15 ohms/wire (Conductor resistance between three wires should be equal).

Input type: Universal input type Thermocouple, RTD, Millivolt, Voltage, Current, Serial Input (Modbus Rs-485) Input types are software selectable.

Table 1

Type	Range	Accuracy	Resolution
E	-200 to 1000°C	±0.1% of instrument range ± 1 digit for temperature equal to or higher than 0º C ± 0.25% of instrument range ± 1 digit for temperature below 0º C ±0.25% of instrument range ± 1 digit(B,R,S TYPE TC)	0.1°C (1°C B,R,S TYPE TC)
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	-199.9 to 850.0°C	± 0.1% of instrument range ± 1 digit	
0 to 75mV	-1999 to 9999	± 0.1% of instrument range ± 1 digit	1 Count
0 to 100mv			
0.4 to 2V			
0 to 2V			
0-20 mA*			
4-20 mA*			
0 to 5V			
1 to 5V			
0 to 10V			

-10 to 20mV			
SI(Serial Input Modbus RS-485)	-1999 to 9999	-	1 Count

*For DC current input, 100 Ohms (0.1%, 25 ppm) shunt resistor must be connected externally. For DC current and Voltage input, Scaling is possible and decimal point is selectable.

Digital Output (Relay)

NUMBER OF OUTPUTS	4
PURPOSE	Alarm or trip
OUTPUT SIGNAL	Two terminals (NC/NO and C) (NC/NO is selectable by jumper setting)
RELAY CONTACT RATING	250 V AC or 30 V DC, 2A (resistive load)
OPERATION MODE	**Internal:** Physical AI Values, Modbus AI Values **External:** Direct Commands Through Modbus Master

Retransmission Output (Optional)

NUMBER OF OUTPUTS	1
OUTPUT SIGNAL	0-20 mA, 4-20 mA, 0-5 V, 1-5 V or 0-10 V DC. Voltage or current output can be selected through software and internal jumper settings.
LOAD RESISTANCE	500 ohms Max. Or less for current output. 3k or higher for voltage output
OUTPUT ACCURACY	±0.25% of span
OPERATION MODE	**Internal:** Physical AI Values, Modbus AI Values **External:** Direct Commands Through Modbus Master

Programming Settings

KEYPAD	4-keys (Menu/Enter, Escape, Shift/Decrement/Ack, Increment/Automanual) non-tactile membrane keypad provided for modification of all control and functional parameters.
CONFIGURATION SOFTWARE	All Configurable parameters can be set through RS-485 Modbus.
DATA BACKUP	Non-volatile memory (can be written up to 100000 times).
MEMORY	Non volatile, restored after power loss.

masibus
A Sonepar Company

Communication Specification

NO. OF COMMUNICATION PORT	1-RS485.
COMMUNICATION TYPE	Half duplex/Asynchronous
COMMUNICATION PROTOCOL	MODBUS RTU (Baud rate and Parity bit are selectable). All parameters are Configurable through MODBUS Protocol.
MAXIMUM NO. OF UNITS	32
COMMUNICATION ERROR DETECTION	CRC Check

Display Specification

CHANNEL NO. DISPLAY	1-digits, 7-segment, Green , 0.56" character height
PV DISPLAY	4-digits, 7-segment, Red, 0.56'' character height
STATUS LEDs	4-Red LEDs for Relay status ,1-Red LED Auto/Manual mode status, 2-Red LEDS for Communication.

Power Supply Specification

RATED VOLTAGE	85 to 260V AC at 50/60 Hz, Rated Dc voltage 100 to 300VDC / Rated Voltage of 18V to 36V DC(Optional)
POWER CONSUMPTION	Max. <10 VA

Signal Isolations And Insulation Specification

ISOLATION RATING	Withstanding Voltage: 1) Between primary terminals[(1)] and secondary terminals[(2)]: 1500VAC for 1 minute 2) Between secondary terminals: 500V AC for 1 minute
SIGNAL ISOLATION	As specified in Table 1
INSULATION RESISTANCE	> 20 Mohms at 500V DC

[(1)] Primary terminals indicate power terminals and relay output terminals
[(2)] Secondary terminals indicate analog input signals, Digital Contact output terminals, communication Terminals.

Signal Isolation Specifications:
Table 1 Signal Isolation Specification

Sr No	Signals	Signal Isolation
1	Power Input	Isolated from other input/output terminals and

		internal circuit.
2	Retransmission Output (Current/Voltage)	Not isolated from current or voltage outputs Isolated from other input/output terminals and internal circuit.
3	RS-485 Communication	Isolated from other input/output terminals and internal circuit
4	Relay contacts	Isolated between contact output terminals and from other Input/output terminals and internal circuit.
5	PV input terminals (4 Channel input)	Not isolated input terminals and from the internal circuit. But isolated from other input/output terminals.

Construction, Installation, and Wiring Specification

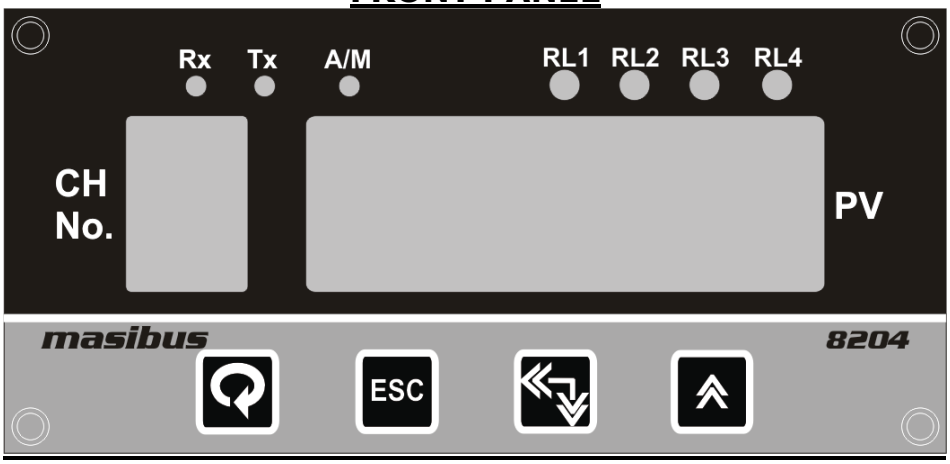
MATERIAL	ABS resin and Polycarbonate.
CONSTRUCTION	Only the front panel is dust-proof.
CASE COLOR	Black
WEIGHT	0.4 kg or less.
ENCLOSURE DIMENSION	48 (W) x 96 (H) x 130 (depth from panel face) mm.
PANEL CUTOUT	46 x 92 mm
FRONT BEZEL	48 x 96 mm

Environmental Specification

AMBIENT TEMPERATURE	0 to 55°C
HUMIDITY	30% to 95% RH (Non-Condensing)
TEMPERATURE COEFFICIENT	For All Analog input circuits < 100ppm Retransmission(Optional) <150ppm.
INSTRUMENT WARM-UP TIME	>30 minutes after power on

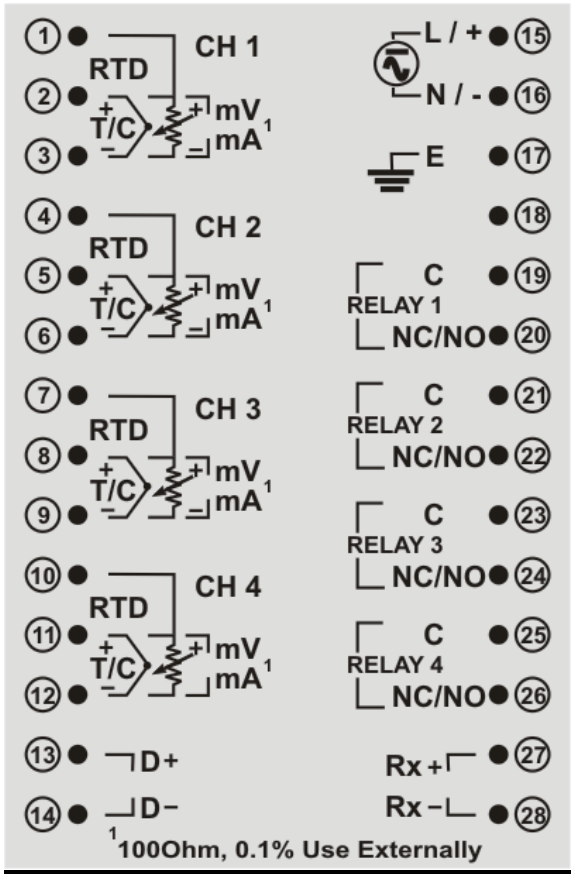
4. Front and Back Panel Description:

FRONT PANEL



Name of Part	Function
Process Value Display**(DATA window)**	Displays Process Value. Display Parameter Name When You Set Parameter. Displays Error Message When An Error Occurs.
Channel No. Display **(CHANNEL window)**	Displays Channel Number in run mode. Also it will display relay number (01 – 04) in set mode (i.e.R.1,R.2,R.3,R.4) It will also display Group no(GP 1,GP 2/GP 1,GP 2,GP 3,GP 4) in set mode
Relay Indicator LED **(RL1, RL2, RL3, & RL4)** **OR** Open Sensor Indicator LED	When Respective Relay LED Lits (In Red). OR When Channel is OPEN(Channel no. is corresponding to Relay no.)
Auto/Manual Indicator LED **(A/M)**	If LED is on, it indicates Manual mode and if LED is off Auto Mode.
Communication Indicator LEDs**(Rx,Tx)**	When Communication on, two LEDs (In Red) blink.

BACK PLATE CONNECTION DETAIL:



masibus
A Sonepar Company

5. Key Function Description:

MENU/ENTER KEY: 

It is used to enter in the sub menu (various levels) and save the parameters to nonvolatile memory, when user setting a proper data by Increment and shift key for parameter configuration.

ESCAPE KEY: 

It is used to come out from any sub menu (various levels) to the run mode. It is used for come out of the manual mode to auto mode too.

INCREMENT KEY: 

It is used to increment the parameter for selection. Value of parameter can be incremented by pressing this key. When first time increment key is pressed, DP (decimal point) in PV display blink, so user can modify the value with increment key. It is used to increment the value in particular digit. Value can be incremented from 0- 9 and from '9' again it rollovers to '0'. The function Auto/Manual is integrated with this key. This key is used to enter into manual mode while the unit is in run mode.

SHIFT KEY/DECREMENT KEY: 

It is used to Shift the digit to set the parameter as describe in increment key when DP (decimal point) started to blink. Menu key is used to go forward to show next parameter and Shift key is used to go backward to show previous parameter.

6. Menu Layout:

RUN TIME INDICATION:

Following parameters can view or change during run time.

- Immediately after powering, unit will run in Auto Mode. In auto mode channel will scan automatically according to scan time selection (1-250 second).
- By pressing **INCREMENT Key** in run mode, Channel number scanning on display is stopped. By pressing increment key again, we can change channel number manually.
- By pressing **SHIFT/DECREMENT Key** in run mode, relay acknowledgement can be done.
- By pressing **ESCAPE Key** after going into the Manual Mode unit comes back to run mode.

Level – 1:-

Pressing MENU key DATA window shows **LVL1** (LvL1) message. Press MENU key again DATA window shows **pWd** (PWD) message, press increment key twice to select password and then press MENU key to enter into Level-1. DATA window shows **SP.1** (SP.1) message and by pressing increment key, DATA window shows Set Point-1 Value. Use INC and SHIFT key to modify value. OR press MENU key again to change Set-point 1 for Channel 2. ESCAPE KEY is used to come out SP.1

LEVEL 1				
Parameter (DATA window)		Setting name and description	Default value	Shows only if
Symbol	Name			
pwd (PWD)	Level-1 Password	0 to 9999	0000	-
Sp.1 (SP.1)	Target Set point-1	SetPoint-1 for Channel 1 to 4.	0100 (for all 4 channels)	Relay group 1 or 2 or 4 is selected
SP.2 (SP.2)	Target Set point-2	SetPoint-2 for Channel 1 to 4.	0150(for all 4 channels)	Relay group 2 is selected
SP.3 (SP.3)	Target Set point-3	SetPoint-3 for Channel 1 to 4.	0200(for all 4 channels)	Relay group 1 is selected
SP.4 (SP.4)	Target Set point-4	SetPoint-4 for Channel 1 to 4.	0250(for all 4 channels)	Relay group 1 is selected
Hys	Hystresis	Hystresis for Channel 1	0002(for	-

(HYS)		to 4.	all 4 channels)	

LEVEL 2:-

Pressing MENU key DATA window shows **LvL2** (LvL2) message. Press MENU key again DATA window shows **pwd** (PWD) message, press increment key twice to select password and then press MENU key to enter Level-2. Following parameters can be configured in LEVEL – 2.

LEVEL 2:				
Parameter (DATA Window)		Setting name and description	Default value	Shows only if
Symbol	Name			
pwd (PWD)	Level-2 Password	0 to 9999	0000	-
inpt (inP.t)	PV Input Type (E, J, K, T Etc.)	Follow **Table 3**(Input type for 1-4 channel)	RTD(for all 4 channel)	-
Pv.hi (PV.HI)	Process value range high setting (PV high > PV low)	Range of the sensor /-1999 to 9999 (for linear input types/Si Input over RS485)(1-4 Channel)	1370(for all 4 channel)	-
Pv.lo (PV.LO)	Process value range lower setting	Range of the sensor /-1999 to 9999 (for linear input types/Si Input Over RS485)(1-4 Channel)	-200(for all 4 channel)	-
dp (dP)	Decimal Point Setting Only applicable for Linear input type is selected	0 to 3(1 – 4 Channel)	0(for all 4 channel)	-
Rl.lg (rL.LG)	Relay Logic(Applicable for 4-RELAY)	**nl** / **fs** (Normal / Fail Safe) 0:Normal 1:Fail Safe	Normal(for all 4 Relay)	If **do.oP** is set to int.r Operation Mode
Rl.oP (rL.oP)	Relay Operation	**Al** / **Co** (Alarm / Control Output) 0:Alarm 1: Control Output	Alarm	If **do.oP** is set to int.r Operation Mode
Rl.fn (rL.Fn)	Relay Function(Applicable for 4-RELAY)	**AL** / **TR** (Alarm / Trip) 0:ALARM 1:TRIP	Alarm(for all 4 Relay)	If **do.oP** is set to int.r Operation Mode
Rl.dl (rL.dL)	Relay Delay(Applicable for 4-RELAY)	1 to 99 seconds	1 second(for all 4 Relay)	If **do.oP** is set to int.r Operation Mode

Rl.o.s (rL.o.S)	Relay Open sensor(Applicable for 4-RELAY)	**up** / **Dn** (UP / Down) 0:DOWN 1:UP	Up Scale(for all 4 Relay)	If **do.oP** is set to int.r Operation Mode
Rl.mp (rl.mp)	Relay mapping (Applicable for 1 -4 Channel)	See Relay Configuration	Refer Note:3	If **do.oP** is set to int.r Operation Mode
Rl.tp (rl.tp)	Relay Group Type	See Relay Configuration	Refer Note:2	If **do.oP** is set to int.r Operation Mode

Relay Configuration:

Relay configuration depends on the selection of Relay group i.e. Relay group 1 or Relay group 2 or Relay group 4 in Level-3 (Relay Group Configuration will be retained even if **do.op** is switched from Int.r to M.bus & M.bus to Int.r mode).

Relay Group - 1:

If **relay group – 1** is selected, there will be only one group of relay. That group has four relays. **(G-1).**
G-1 means RELAY 1 and RELAY 2 and RELAY 3 and RELAY 4

Example:

CHANNEL NO	NONE	G-1
1		✓
2		✓
3	✓	
4		✓

Note 1:

1) None means no group is selected for channel.

Relay Type can be selected as shown below:

Relay Group	Relay Type
G - 1	Low ON (**L**) or High ON (**H**)

Relay Group - 2:

If **relay group – 2** is selected, there will be two group of relay. Each group has two relays. **(G-1 and G-2).**
G-1 means RELAY 1 and RELAY 3
G-2 means RELAY 2 and RELAY 4

Example:

CHANNEL NO	NONE	G-1	G-2
1		✓	
2			✓
3	✓		
4		✓	

Note 2:

2) All Groups can not be selected for single Channel .
3) None means no group is selected for particular channel.

Relay Type can be selected as shown below:

Relay Group	Relay Type
G – 1	High/ Very High (**H-VH**) or Very Low /Low (**VL-L**) or Low/High (**L-H**)
G – 2	High/ Very High (**H-VH**) or Very Low /Low (**VL-L**) or Low/High (**L-H**)

Relay Group - 4:

If **relay group – 4** is selected, there will be four group of all 4 relays. Each group has one relay. **(G -1, G -2, G -3 and G -4).**

G -1 means RELAY 1
G -2 means RELAY 2
G -3 means RELAY 3
G -4 means RELAY 4

Example:

CHANNEL NO	NONE	G -1	G -2	G -3	G -4
1		✓			
2	✓				
3			✓		
4					✓

Relay Type can be selected as shown below:

Relay Group	Relay Type
G - 1	Low ON (**L**) or High ON (**H**)
G - 2	Low ON (**L**) or High ON (**H**)
G - 3	Low ON (**L**) or High ON (**H**)
G - 4	Low ON (**L**) or High ON (**H**)

Note 3:

1) More than **one Group** cannot be selected for single Channel .
2) None means no group is selected for particular Channel.
3) If **rL.oP** is set to **Co** then All relay will be assigned channel wise.

Whenever **rL.oP** is set to **Co** then All relay will be assigned channel wise and all assignments are remain fixed. And Relay type

Example:

CHANNEL NO	NONE	G -1	G -2	G -3	G -4
1		✓			
2			✓		
3				✓	
4					✓

Relay Type can be selected as shown below:

Relay Group	Relay Type
G - 1	Low ON (**L**) or High ON (**H**)
G - 2	
G - 3	
G - 4	

For relay functionality Refer Relay outputs (Chapter – 9).

LEVEL – 3:

Pressing MENU key DATA window shows **LvL3** (LvL3) message. Press MENU key again DATA window shows **pwd** (PWD) message, press increment key twice to select password and then press MENU key to enter into Level-3.Following parameters can be configured in LEVEL – 3.

LEVEL 3:				
Parameter (DATA Window)		Setting name and description	Default value	Shows only if
Symbol	Name			
pwd (PWD)	Level-3 Password	0 to 9999	0000	-
Skip (skip)	Channel skip/Unskip selection.	**yes** / **no** 0:NO 1:YES	0(for all 4 channel	-
Rl.lH (rL.LH)	Relay Latch	**on** / **off** 0:OFF 1:ON	0	If **do.oP** is set to int.r Operation Mode
Rl.Gp (rL.GP)	Relay Group	**RGP.4** / **rGP.2** 0:Relay Group-4 1:Relay Group-2 2:Relay Group-1	1	If **do.oP** is set to int.r Operation Mode
SCAn (SCAn)	Scan Time	1 to 250 seconds	1	-
A.CJC (A.CJC)	Auto cold junction (Only applicable for TC input type	**yes** / **no** 0:NO 1:YES	1	-
F.CJC (F.CJC)	Fix cold junction (Only applicable for TC input type	0.0 to 60.0 Deg C	0.0 Deg C	-
Sr.no (Sr.no)	Unit ID	1 to 247	1	-
BAUd (baud)	Communication Baud rate	**9600** / **19.2K** 0:(9600) – 9600 bps 1:(19.2K) –19.2 Kbps	19.2k bps	
Pr.St (Pr.St)	Parity/Stop bit selection	**p.n.S.1** / **P.nS.2** / **P.o.s1** / **P.ES.1** 0:(P.N.S.1)-parity none-stop bit-1 1:(P.N.S.2)-parity none - stop bit-2 2:(P.O.S.1)-parity odd -stop bit-1 3:(P.E.S.1)-parity even - stop bit-1	No parity /Stop bit - 2	
T.ouT (t.out)	Timeout for display back to Run Mode	10 to 100 Seconds	60	-
rt.o.S (rt.o.s)	Retrasmission Open sensor	**up** / **DoWn** 0:DOWN	1	If **rt.oP** is set to int.r

		1:UP		Operation Mode
Rt.tp (rt.tp)	Retransmission Output Type	**0-20/4-20/ 0-5v/1-5v/ 0-10v** 0:(0-20) – 0-20mA 1:(4-20) – 4-20mA 2:(0 - 5) – 0 – 5volt 3:(1 - 5) – 1 – 5volt 4:(0 – 10) - 0 -10volt	1	-
Rt.dr (rt.dr)	Retransmission direction	**Dir / rev** 0: (rev) 1:(dir)	1	-
Rt.CH (rt.CH)	Retransmission Channel	1 to 4 channel	1	If **rt.oP** is set to int.r Operation Mode
Rt.rd (rt.rd)	Retransmission Channel Value	**MAx / Min / avg** 0: (Min) 1: (Max) 2: (Avg)	1	If **rt.oP** is set to int.r Operation Mode r
S.Pwd (S.PWD)	Password Set password to lock selected level	0 to 9999	0	-
do.oP	Digital Output Operation (Relay) (Internal/M.bus)	**Int.r/M.bUS** 0: (**Int.r**) 1:(**M.bUS**)	0: (**Int.r**)	-
rt.oP	Retransmission Analog Output Operation (Internal/M.bus)	**Int.r/M.bUS** 0: (**Int.r**) 1:(**M.bUS**)	0: (**Int.r**)	-
Si.to	Serial Input communication Timeout	1-255(Sec)	30	if any or all input type of channel is selected "SI"
C.b.dP	Serial Input Write communication break Display	**LSt.P/----** 0: (**LSt.P**) 1: (----)	0: (**LSt.P**)	if any or all input type of channel is selected **"SI"**
do.to	Timeout for Relay(Digital output) operating in M.bus mode.	**0(off)/1-255 Sec (on)** 0:off 1-255 Sec (ON)	0 (Off)	If **do.oP** is set to M.bus (External) Operation Mode
rt.to	Timeout for Retransmission operating in M.bus mode.	**0(off)/1-255 Sec (on)** 0:off 1-255 Sec (ON)	0 (Off)	If **rt.oP** is set to M.bus (External) Operation Mode
rt.Pv	Retransmission Output Predefine Value in M.bus mode.	0: Scale Low 1: Scale High	0 (Scale Low)	If **rt.oP** is set to M.bus (External) Operation Mode

Calibration: -

Pressing MENU key, DATA window shows **CAL** (CAL) message. Press MENU key again, DATA window shows **pwd** (PWD) message, press increment key twice to select password and then press MENU key to enter into Calibration.

Calibration:				
Parameter (DATA Window)		Setting name and description	Default value	Shows only if
Symbol	Name			
pwd (PWD)	Password	0 to 9999	0000	-
amb (Amb)	Ambient	Ambient adjustment	-	-
CAL.Z (CAL.Z)	Thermocouple, Rtd and Linear Zero Calibration	Depending on PV sensor type selected	-	-
CAL.S (CAL.S)	Thermocouple, Rtd and Linear Span Calibration	Depending on PV sensor type selected	-	-
Rtr.Z (rtr.Z)	Retransmission voltage and current Zero calibration	Depending on Retransmission type selected	-	-
Rtr.S (rtr.S)	Retransmission voltage and current Span calibration	Depending on Retransmission type selected	-	-

Factory Reset Parameters:

Pressing MENU key, DATA window shows **F.RST** (F.rST) message. Press MENU key again, DATA window shows **pwd** (PWD) message, press Increment key twice to select password and then press MENU key to enter into Factory Reset.

Factory Reset Mode:				
Parameter (DATA window)		Setting name and description	Default value	Shows only if
Symbol	Name			
Pwd (Pwd)	Password	0 to 9999	-	-
L.def (L.dEF)	LOAD Default	**CAL\PARA\ all** (CAL)\(PARA)\(ALL) **CAL-** Only calibration set to default value **PARA-** All parameters excluding calibration will set to default value **ALL-**Calibration and parameters will set to default value	-	-

Note: - Factory reset will load default parameters, as mention in MENU LAYOT (Default value). Once this function applies, user has to switch off the instrument and again switch on the instrument to work according to Default value.

INPUT TYPE SELECTION TABLE:

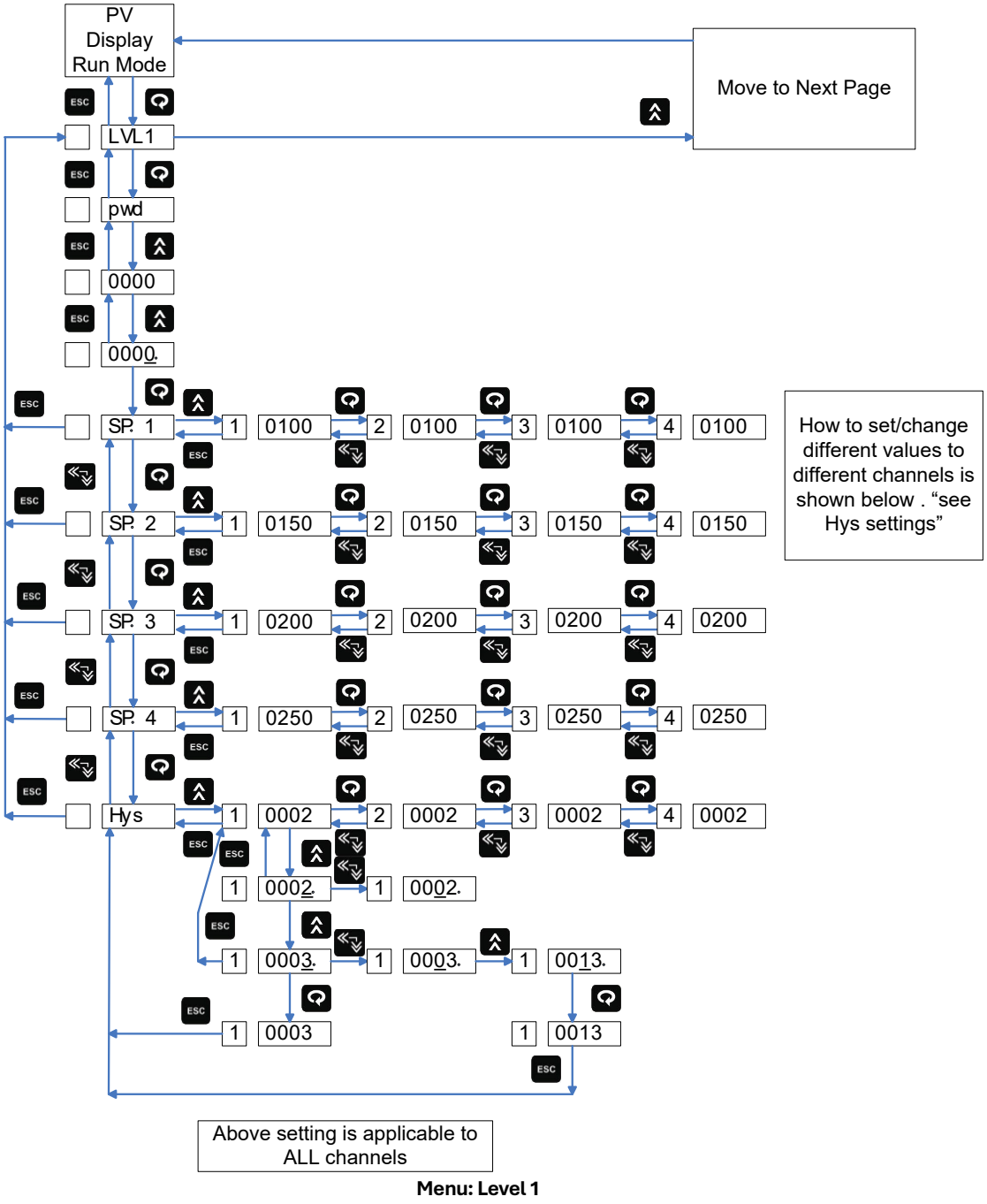
Type	I/P NO	Type Display	Range	Resolution
E	1	E Tc	-200 to 1000°C	0.1°C
J	2	J tc	-200 to 1200°C	
K	3	K tc	-200 to 1370°C	
T	4	T tc	-200 to 400°C	
B	5	B tc	450 to 1800°C	
R	6	R tc	0 to 1750°C	
S	7	S tc	0 to 1750°C	
N	8	n tc	-200 to 1300°C	
RTD	9	RTD	-199.9 to 850.0°C	
-10 to 20mV	10	-10.20	-1999 to 9999 Counts	1 Count
0 to 75mv	11	0-75		
0 to 100mV	12	0-100		
0.4 to 2V	13	0.4-2		
0 to 2V	14	0-2V		
4 to 20mAmp	15	4-20		
0 to 20mAmp	16	0-20		
0 to 5V	17	0-5V		
1 to 5V	18	1-5V		
0 to 10V	19	0-10V		
SI(Serial Input Modbus RS-485)	20	SI	-1999 to 9999 Counts	1 Count

Table 3

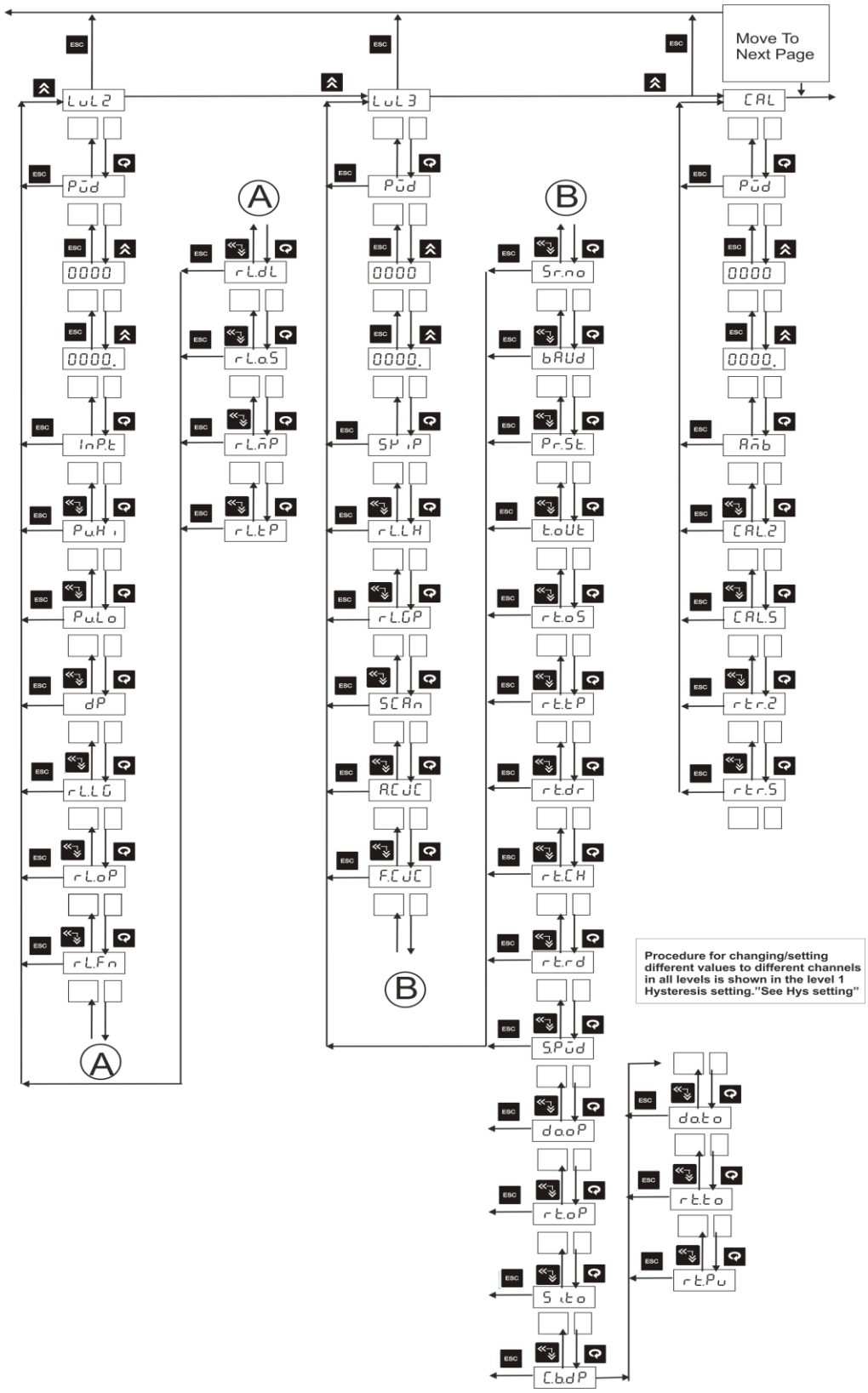
masibus
A Sonepar Company

7. Parameter Flow Chart :

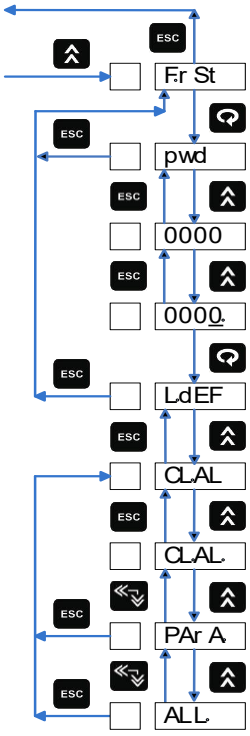
4 Channel Scanner-8204 has a number of software parameters which may or may not be required depending on your particular applications.



Menu: Level 1



Menu: Level 1-2-3



Procedure for changing/setting different values to different channels in all levels is shown in the level 1 Hysteresis setting. “see Hys settings”

Menu: Factory Settings

8. Flexible I/O's Operation Modes

Analog Input (4 Channels)

	Operation Mode	Input Type	Source
Analog Input (4 Channel)	Physical AI Values	RTD / Thermocouple / mA / V Type	Wired Sensor
	Modbus AI Values	Serial Input Type(Si)	Written By Modbus RTU Master device
	Mix Input (Modbus + Physical) AI Values	RTD / Thermocouple / mA / V + Serial Input Type(Si)	Wired Sensor + Written By Modbus RTU Master device

Digital (Relay) Outputs

	Operation Mode	Control Logic	RS485 Modbus Write Control (Coil)
DO 1-4 (Relay)	**Internal:** Physical AI Values, Modbus AI Values based Relay Control	Relay ON/OFF based on Relay Logic (setpoint/hysteresis)	No
	External (M.BUS): Direct Commands Through Modbus Master based Relay Control	Direct ON/OFF via Modbus write (Coil)	Yes

Retransmission Output

	Operation Mode	Description	RS485 Modbus Write Control
Retransmission Output	**Internal:** Physical AI Values, Modbus AI Values based Retransmission Output	Retransmission Output Based on AI Values	No
	External (M.BUS): Direct Commands Through Modbus Master based Retransmission Output	Retransmission Output follows Modbus RTU Master device write on Retransmission Output Modbus Value Register	Yes

masibus
A Sonepar Company

9. Relay Outputs:

Following function is only applicable for **do.op** in **Int.r** mode Relay outputs.

Relay Logic (Direction):
Relay Logic means Relay contact can be changed from Open to Close OR Close to Open. If relay logic is selected Normal, when Fault occur Relay contact will change from Close to Open. If relay logic is selected Fail Safe, when Fault occur Relay contact will change from Open to Close.

Relay Function: Relay function can be selected as ALARM or TRIP.
If relay is selected as ALARM, when abnormal condition occur Relay will ON, once normal condition after abnormal conditions occur Relay will OFF.
If relay is selected as TRIP, when abnormal conditions occur Relay will ON, once normal condition after abnormal conditions occur Relay will ON. Relay will be off through Acknowledge.

Relay Delay: A time delay can be provided for the actual output.

Relay Open Sensor:
Open sensor up scale or down scale can be selected for each relay output.

Relay Mapping:
Refer Menu layout LEVEL - 2

Relay Types: Various relay operations are shown in the reference figure. (High, Low, Very High- High, Low-Very Low, High- Low)
For relay types selection Refer Menu layout LEVEL – 2.

Relay logic table:

ALARM 1
MOMEMTARY ALARM
(when in abnormal condition ack not pressed)

CONDITION				NORMAL	ABNORMAL	UP (O/S)	DOWN (O/S)	ACK **	NORMAL *	ACK ***
HIGH	ALARM	LATCH YES	LAMP	OFF	STEADY	STEADY	OFF		STEADY	OFF
			RELAY	OFF	ON	ON	OFF		OFF	OFF
	ALARM	LATCH NO	LAMP	OFF	STEADY	STEADY	OFF		OFF	OFF
			RELAY	OFF	ON	ON	OFF		OFF	OFF
	TRIP		LAMP	OFF	STEADY	OFF****	OFF****		STEADY	OFF
			RELAY	OFF	ON	OFF****	OFF****		ON	OFF
LOW	ALARM	LATCH YES	LAMP	OFF	STEADY	OFF	STEADY		STEADY	OFF
			RELAY	OFF	ON	OFF	ON		OFF	OFF
	ALARM	LATCH NO	LAMP	OFF	STEADY	OFF	STEADY		OFF	OFF
			RELAY	OFF	ON	OFF	ON		OFF	OFF
	TRIP		LAMP	OFF	STEADY	OFF****	OFF****		STEADY	OFF
			RELAY	OFF	ON	OFF****	OFF****		ON	OFF
VLOW	ALARM	LATCH YES	LAMP	OFF	STEADY	OFF	STEADY		STEADY	OFF
			RELAY	OFF	ON	OFF	ON		OFF	OFF
	ALARM	LATCH NO	LAMP	OFF	STEADY	OFF	STEADY		OFF	OFF
			RELAY	OFF	ON	OFF	ON		OFF	OFF
	TRIP		LAMP	OFF	STEADY	OFF****	OFF****		STEADY	OFF
			RELAY	OFF	ON	OFF****	OFF****		ON	OFF

ALARM AL2
MOMEMTARY ALARM
(when in abnormal condition ack not pressed)

CONDITION				NORMAL	ABNORMAL	UP (O/S)	DOWN (O/S)	ACK **	NORMAL *	ACK ***
VHIGH	ALARM	LATCH YES	LAMP	OFF	STEADY	STEADY	OFF		STEADY	OFF
			RELAY	OFF	ON	ON	OFF		OFF	OFF
	ALARM	LATCH NO	LAMP	OFF	STEADY	STEADY	OFF		OFF	OFF
			RELAY	OFF	ON	ON	OFF		OFF	OFF
	TRIP		LAMP	OFF	STEADY	OFF****	OFF****		STEADY	OFF
			RELAY	OFF	ON	OFF****	OFF****		ON	OFF
HIGH	ALARM	LATCH YES	LAMP	OFF	STEADY	STEADY	OFF		STEADY	OFF
			RELAY	OFF	ON	ON	OFF		OFF	OFF
	ALARM	LATCH NO	LAMP	OFF	STEADY	STEADY	OFF		OFF	OFF
			RELAY	OFF	ON	ON	OFF		OFF	OFF
	TRIP		LAMP	OFF	STEADY	OFF****	OFF****		STEADY	OFF
			RELAY	OFF	ON	OFF****	OFF****		ON	OFF
LOW	ALARM	LATCH YES	LAMP	OFF	STEADY	OFF	STEADY		STEADY	OFF
			RELAY	OFF	ON	OFF	ON		OFF	OFF
	ALARM	LATCH NO	LAMP	OFF	STEADY	OFF	STEADY		OFF	OFF
			RELAY	OFF	ON	OFF	ON		OFF	OFF
	TRIP		LAMP	OFF	STEADY	OFF****	OFF****		STEADY	OFF
			RELAY	OFF	ON	OFF****	OFF****		ON	OFF

masibus
A Sonepar Company

ALARM AL1
MAINTAINED ALARM
(when in abnormal condition ack is pressed)

CONDITION				NORMAL	ABNORMAL	UP (O/S)	DOWN (O/S)	ACK **	NORMAL *	ACK ***
HIGH	ALARM	LATCH YES	LAMP	OFF	STEADY	STEADY	OFF	STEADY	STEADY	OFF
			RELAY	OFF	ON	ON	OFF	OFF	OFF	OFF
	ALARM	LATCH NO	LAMP	OFF	STEADY	STEADY	OFF	STEADY	OFF	OFF
			RELAY	OFF	ON	ON	OFF	OFF	OFF	OFF
	TRIP		LAMP	OFF	STEADY	OFF****	OFF****	STEADY	STEADY	OFF
			RELAY	OFF	ON	OFF****	OFF****	ON	ON	OFF
LOW	ALARM	LATCH YES	LAMP	OFF	STEADY	OFF	STEADY	STEADY	STEADY	OFF
			RELAY	OFF	ON	OFF	ON	OFF	OFF	OFF
	ALARM	LATCH NO	LAMP	OFF	STEADY	OFF	STEADY	STEADY	OFF	OFF
			RELAY	OFF	ON	OFF	ON	OFF	OFF	OFF
	TRIP		LAMP	OFF	STEADY	OFF****	OFF****	STEADY	STEADY	OFF
			RELAY	OFF	ON	OFF****	OFF****	ON	ON	OFF
VLOW	ALARM	LATCH YES	LAMP	OFF	STEADY	OFF	STEADY	STEADY	STEADY	OFF
			RELAY	OFF	ON	OFF	ON	OFF	OFF	OFF
	ALARM	LATCH NO	LAMP	OFF	STEADY	OFF	STEADY	STEADY	OFF	OFF
			RELAY	OFF	ON	OFF	ON	OFF	OFF	OFF
	TRIP		LAMP	OFF	STEADY	OFF****	OFF****	STEADY	STEADY	OFF
			RELAY	OFF	ON	OFF****	OFF****	ON	ON	OFF

ALARM AL2
MAINTAINED ALARM
(when in abnormal condition ack is pressed)

CONDITION				NORMAL	ABNORMAL	UP (O/S)	DOWN (O/S)	ACK **	NORMAL *	ACK ***
VHIGH	ALARM	LATCH YES	LAMP	OFF	STEADY	STEADY	OFF	STEADY	STEADY	OFF
			RELAY	OFF	ON	ON	OFF	OFF	OFF	OFF
	ALARM	LATCH NO	LAMP	OFF	STEADY	STEADY	OFF	STEADY	OFF	OFF
			RELAY	OFF	ON	ON	OFF	OFF	OFF	OFF
	TRIP		LAMP	OFF	STEADY	OFF****	OFF****	STEADY	STEADY	OFF
			RELAY	OFF	ON	OFF****	OFF****	ON	ON	OFF
HIGH	ALARM	LATCH YES	LAMP	OFF	STEADY	STEADY	OFF	STEADY	STEADY	OFF
			RELAY	OFF	ON	ON	OFF	OFF	OFF	OFF
	ALARM	LATCH NO	LAMP	OFF	STEADY	STEADY	OFF	STEADY	OFF	OFF
			RELAY	OFF	ON	ON	OFF	OFF	OFF	OFF
	TRIP		LAMP	OFF	STEADY	OFF****	OFF****	STEADY	STEADY	OFF
			RELAY	OFF	ON	OFF****	OFF****	ON	ON	OFF
LOW	ALARM	LATCH YES	LAMP	OFF	STEADY	OFF	STEADY	STEADY	STEADY	OFF
			RELAY	OFF	ON	OFF	ON	OFF	OFF	OFF
	ALARM	LATCH NO	LAMP	OFF	STEADY	OFF	STEADY	STEADY	OFF	OFF
			RELAY	OFF	ON	OFF	ON	OFF	OFF	OFF
	TRIP		LAMP	OFF	STEADY	OFF****	OFF****	STEADY	STEADY	OFF
			RELAY	OFF	ON	OFF****	OFF****	ON	ON	OFF

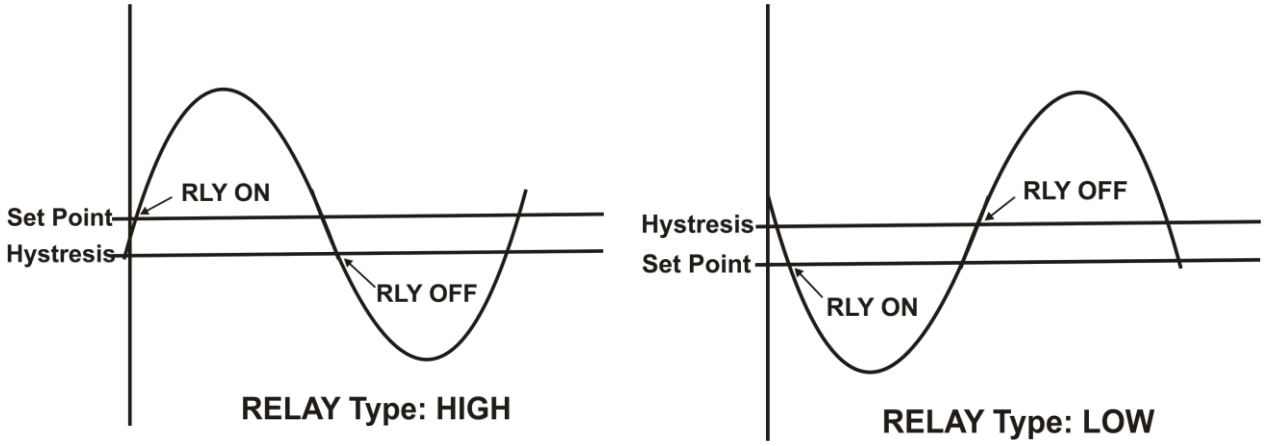
NOTE:

* means normal condition after abnormal has occurred
** means ack pressed in abnormal condition
*** means ack pressed in normal condition after abnormal has already occurred.
******** means it remains in the previous state. If the previous state is ON then it will remain ON and the same case for OFF condition.

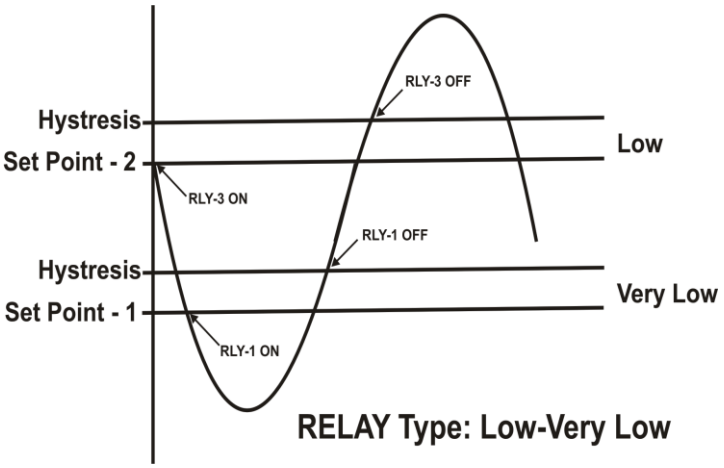
- **All Alarm Status Lamp can only be viewed on Modbus Status Registers.**

Pressing Shift/Decrement key for 3 seconds, acknowledgement will be given for alarm and trip relay in abnormal condition.
Alarm Latch function applicable only for ALARM, there is no affect when TRIP Selected as a relay function LEVEL – 2.

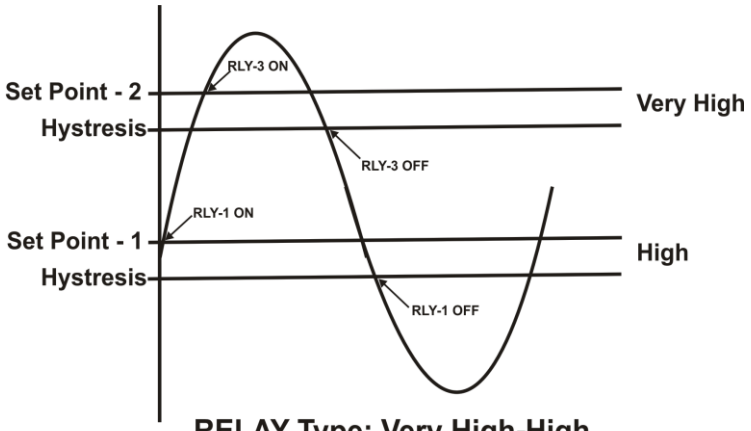
Basic Relay Function:



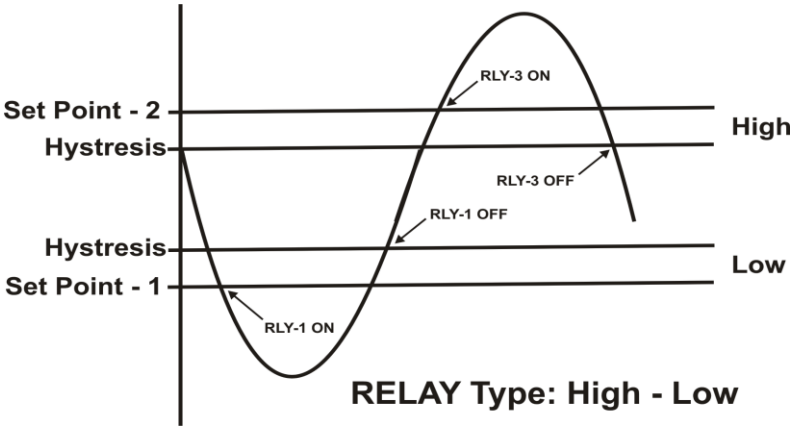
RELAY GROUP - 4



RELAY Type: Low-Very Low

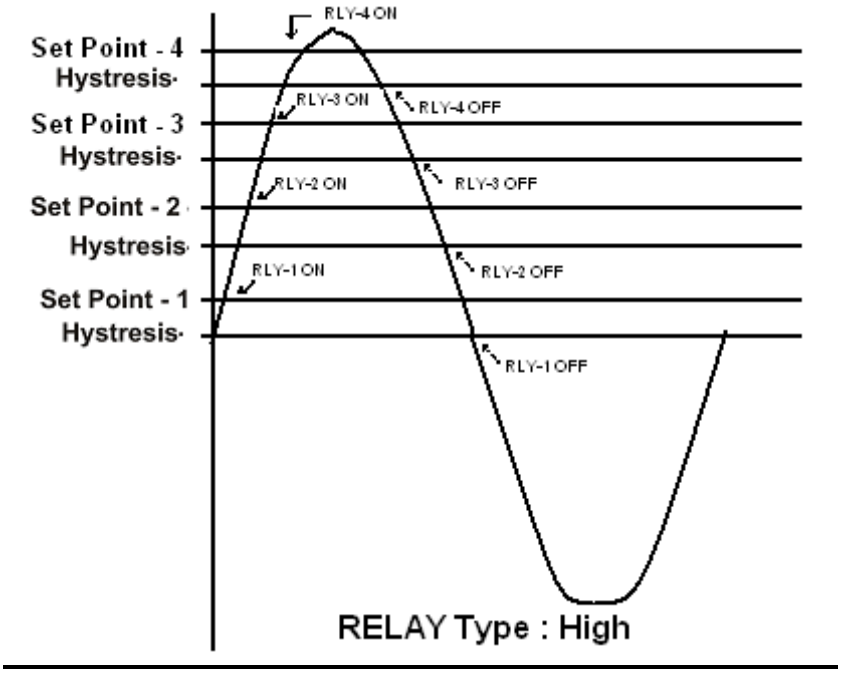


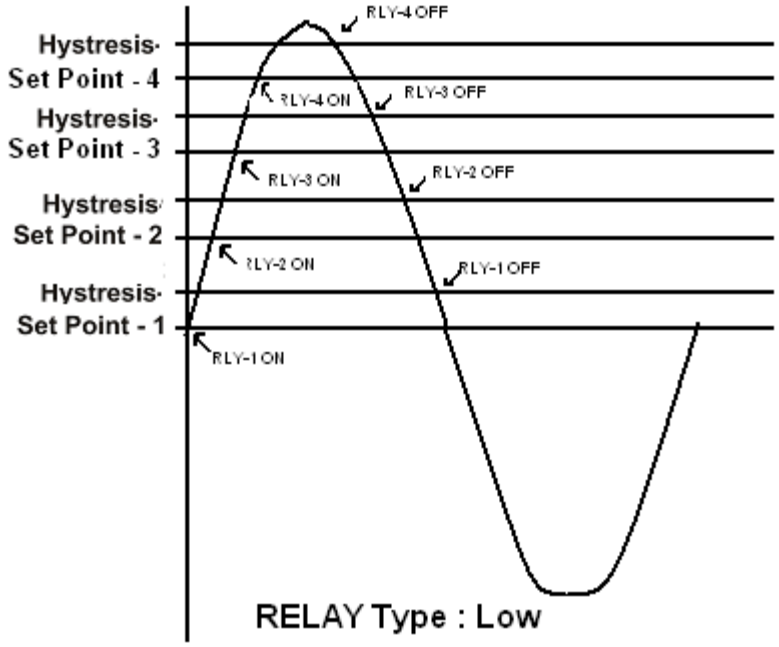
RELAY Type: Very High-High



RELAY Type: High - Low

RELAY GROUP - 2





RELAY GROUP - 1

Control Output (ON/OFF Control) :-

ON/OFF Controller is the simplest form of temperature control device. The output from the device is either on or off, with no middle state. An on-off controller will switch the output only when the temperature crosses the set point. For heating control, the output is on when the temperature is below the set point, and off above set point.Since the temperature crosses the set point to change the output stage, the process temperature will be cycling continually, going from below set point to above, and back below. In cases where this cycling occurs rapidly, and to prevent contactors and valves from getting damaged, an on-off differential, or "hysteresis," is added to the controller operations. This hysteresis ensures if temperature exceeds set point by a certain amount before then only output will turn off or on again. On-Off hysteresis prevents the output from "chattering" or making fast, continual switches if the cycling above and below the set point occurs very rapidly.

Relay type High (H-ON):
For High type of set value, once process value reaches up to set point + Hysteresis value, relay will be ON after few seconds (as per relay delay) and it will be ON until process value goes down to Set point.

Relay type Low (L-ON):
For Low type of set value, once process value reaches down to set point - Hysteresis value relay will be ON after nearly few seconds (as per relay delay) and it will be ON until process value goes up toward Set point.

NOTE:-
8204 has both Control Logic (ON-OFF) & Alarm Logic. If Control Logic (ON-OFF) is required, rloP in lvl2 must be selected as Co.
Whenever Control Output(ON-OFF) logic is selected , all relays are mapped as shown in chapter no.6. As well as relay latch is off and relay group is assigned as relay per group 1. In this logic, user cannot change relay mapping, relay latch and relay group and user cannot acknowledge relays.

10. Calibration Procedure :

Calibration is provided for ambient temperature, PV sensor input, and Retransmission output.
First select the calibration function as described below and then follow the procedure depending on the parameter to be calibrated. The sequences of parameters that will be available for calibration are listed below:

- Ambient temperature adjustment
- PV Sensor input
- Retransmission output (calibration for voltage or current)

Ambient temperature adjustment:-
DATA window shows **Amb** (Ambient temperature adjusts). If Increment Key is pressed, DATA window shows, temperature measured by the controller and by applying old calibration data.
DP of last digit will blink to indicate that the value can be changed. Use Inc/Shift key to adjust it to desired value. Once the desired value set and press MENU key, the blinking DP will go off to indicate that the value has been registered. The controller will automatically save all the new calculations. Ambient temperature adjustment is over.
Press MENU key to calibrate other parameters or press Escape key to come out to normal operation.

PV input sensor calibration:-
When user enters in calibration menu, DATA window shows **CAL.Z** (Calibration ZERO) for sensor input zero calibration for Thermocouple Linear input and RTD type. Press Increment Key, DATA window shows as per the Input feed. Feed sensor input using a calibrator, such that process value is close to lower range value.

Note: The controller allows the user to calibrate sensor's input anywhere in the range, but it is recommended that it should be calibrate the input at points close to lower and upper range values.

DP of last digit will blink to indicate that the value can be changed. Use Inc/Shift key to correct the displayed reading to the desired process value and press MENU key. The controller will display message **wait** (wait) in the DATA window to indicate that it is doing the necessary calculations.
When the calculations are over, the new calibration values are stored automatically.
So, Zero calibration is over.
Press MENU key to calibrate other parameters or press Escape key to come out to normal operation.

DATA window shows the **CAL.S** (calibration SPAN) for sensor input span calibration for Thermocouple Linear input and RTD type. Press Increment Key, DATA window shows as per the Input feed. Feed sensor input using a calibrator, such that process value is close to sensor's upper range value. Use Inc/Shift key to arrive at the desired process value. Press MENU key to register the changes.
The controller will display message **wait** (wait) in the DATA window to indicate that it is doing the necessary calculations. Depending on the situation, this process may take few seconds to calibrate. Zero and Span calibration is over.

In case the controller cannot complete the calibration due to any reason, it will hold previous calibration parameters. Calibration for input sensor is over.

Retransmission output calibration (Voltage/current output) (Optional):-

Press MENU key repeatedly, till DATA window shows message **rtr.Z** (retransmission output zero calibration).
DATA window shows the value being output on Retransmission output terminals. Measure the value using a highly accurate digital multi meter. Use Inc/Shift key to change measured value observed in multi meter on DATA window. Press MENU key. The controller will store zero calibration value. Press MENU key to calibrate retransmission output span calibration menu.
DATA window shows the message **rtr.S** (retransmission output span calibration). DATA window shows the value being output on retransmission output terminals. Measure the value using a highly accurate digital multi meter. Use Inc/Shift key to change measured value observed in multi meter on DATA window. Press MENU key. When the calculations are over, the new calibration values are stored automatically. Calibration for Retransmission output is over.
Press Escape key to come out to normal operation.

Group Calibration Detail:-

Group NO	Input type	Calibration for input
1	E,J,K,T,N,0-75mv,0-100mv	Either of any input
2	Pt-100(RTD)	Specific input
3	B,R,S,-10 to 20mv	Either of any input
4	0-2V,0.4-2V,4-20mAmp,0-20mAmp	Either of any input
5	0-10V,0-5v,1-5V	Either of any input

NOTE:
If you calibrate any input from any group i.e. I/P E-TC from Group – 1 than calibration is not required for other input types from Group-1.

11. Communication :

The MODBUS Communications protocol as RS-485 interface module is installed. Only RTU mode is supported. Data is transmitted as 8-bit binary bytes with 1 start bit, 1/2 stop bit and optional parity checking (None, Even, Odd). Baud rate may be set to 9600 and 19200.

Function code use for Modbus:

CODE	NAME	Function
01	Write Coil Status	Use to write output and input status
03	Read Holding registers	Use to read PV for 4-channels
04	Read input registers	Use to read programmable registers
05	Force Single Coil	Use to set or reset the coil
06	Preset Single register	Use to write programmable register
15	Write Multiple Coil	Use to write Multiple output and input status

Exception responses for Modbus:

CODE	NAME	Function
01	ILLEGAL FUNCTION	The function code received in the query is not an allowable action for the slave. If a Poll Program Complete command was issued, this code indicates that no program function preceded it.
02	ILLEGAL DATA ADDRESS	The data address received in the query is not an allowable address for the slave
03	ILLEGAL DATA VALUE	A value contained in the query data field is not an allowable value for the slave
06	Slave Device Busy	When Master device write some parameters to Slave device If slave device busy it will send 06 code to indicate slave device is busy.

Modbus Parameter Details for Input Register:

SR.NO.	Parameter	Absolute Address	Parameter Type	Min Value	Max Value	Access Type
1	PV Channel - 1	30001	INT	-	-	R
2	PV Channel – 2	30002	INT	-	-	R
3	PV Channel – 3	30003	INT	-	-	R
4	PV Channel – 4	30004	INT	-	-	R
5	Ambient	30005	INT	-	-	R

Modbus Parameter Details for Holding Register:
Modbus values for OPEN, OVER, UNDER and SKIP Conditions:

SR. NO.	Parameter	Value
1	Open sensor	32767
2	Over reading	32766
3	Under reading	32765
4	Skip Channel	32764

SR. NO.	Parameter	Absolute Address	Parameter Type	Min Value	Max Value	Access Type	Refer Table
1	SP.1 CH – 1	40001	INT	-	-	R/W	T-1
2	SP.1 CH – 2	40002	INT	-	-	R/W	T-1
3	SP.1 CH – 3	40003	INT	-	-	R/W	T-1
4	SP.1 CH – 4	40004	INT	-	-	R/W	T-1
5	SP.2 CH- 1	40005	INT	-	-	R/W	T-1
6	SP.2 CH- 2	40006	INT	-	-	R/W	T-1
7	SP.2 CH- 3	40007	INT	-	-	R/W	T-1
8	SP.2 CH- 4	40008	INT	-	-	R/W	T-1
9	SP.3 CH- 1	40009	INT	-	-	R/W	T-1
10	SP.3 CH- 2	40010	INT	-	-	R/W	T-1
11	SP.3 CH- 3	40011	INT	-	-	R/W	T-1
12	SP.3 CH- 4	40012	INT	-	-	R/W	T-1
13	SP.4 CH- 1	40013	INT	-	-	R/W	T-1
14	SP.4 CH- 2	40014	INT	-	-	R/W	T-1
15	SP.4 CH- 3	40015	INT	-	-	R/W	T-1
16	SP.4 CH- 4	40016	INT	-	-	R/W	T-1
17	HYS CH – 1	40017	INT	1	250	R/W	
18	HYS CH – 2	40018	INT	1	250	R/W	
19	HYS CH – 3	40019	INT	1	250	R/W	
20	HYS CH – 4	40020	INT	1	250	R/W	
21	INPUT TYPE CH - 1	40021	INT	-	-	R/W	T-1
22	INPUT TYPE CH - 2	40022	INT	-	-	R/W	T-1
23	INPUT TYPE CH - 3	40023	INT	-	-	R/W	T-1
24	INPUT TYPE CH - 4	40024	INT	-	-	R/W	T-1
25	Range High CH - 1	40025	INT	-	-	R/W	T-1
26	Range High CH - 2	40026	INT	-	-	R/W	T-1
27	Range High CH - 3	40027	INT	-	-	R/W	T-1
28	Range High CH - 4	40028	INT	-	-	R/W	T-1
29	Range Low CH - 1	40029	INT	-	-	R/W	T-1
30	Range Low CH - 2	40030	INT	-	-	R/W	T-1
31	Range Low CH - 3	40031	INT	-	-	R/W	T-1
32	Range Low CH - 4	40032	INT	-	-	R/W	T-1
33	Decimal Point CH - 1	40033	INT	0	3	R/W	
34	Decimal Point CH - 2	40034	INT	0	3	R/W	
35	Decimal Point CH - 3	40035	INT	0	3	R/W	
36	Decimal Point CH - 4	40036	INT	0	3	R/W	
37	RLY-Logic.1	40037	INT	0	1	R/W	T-2
38	RLY-Logic.2	40038	INT	0	1	R/W	T-2
39	RLY-Logic.3	40039	INT	0	1	R/W	T-2
40	RLY-Logic.4	40040	INT	0	1	R/W	T-2
41	RLY-Operation	40041	INT	0	1	R/W	T-3
42	RLY-Function.1	40042	INT	0	1	R/W	T-4
43	RLY-Function.2	40043	INT	0	1	R/W	T-4
44	RLY-Function.3	40044	INT	0	1	R/W	T-4
45	RLY-Function.4	40045	INT	0	1	R/W	T-4
46	RLY-Delay.1	40046	INT	1	99	R/W	
47	RLY-Delay.2	40047	INT	1	99	R/W	
48	RLY-Delay.3	40048	INT	1	99	R/W	
49	RLY-Delay.4	40049	INT	1	99	R/W	
50	RLY-OpenSensor.1	40050	INT	0	1	R/W	T-5

51	RLY-OpenSensor.2	40051	INT	0	1	R/W	T-5
52	RLY-OpenSensor.3	40052	INT	0	1	R/W	T-5
53	RLY-OpenSensor.4	40053	INT	0	1	R/W	T-5
54	RLY-Map CH - 1	40054	INT	0	2/4	R/W	T-6/7/8
55	RLY-Map CH - 2	40055	INT	0	2/4	R/W	T-6/7/8
56	RLY-Map CH - 3	40056	INT	0	2/4	R/W	T-6/7/8
57	RLY-Map CH - 4	40057	INT	0	2/4	R/W	T-6/7/8
58	RLY-Type.1	40058	INT	0	2/4	R/W	T-9/10
59	RLY-Type.2	40059	INT	0	2/4	R/W	T-9/10
60	RLY-Type.3	40060	INT	0	2/4	R/W	T-9/10
61	RLY-Type.4	40061	INT	0	2/4	R/W	T-9/10
62	SKIP-Channel CH - 1	40062	INT	0	1	R/W	
63	SKIP-Channel CH - 2	40063	INT	0	1	R/W	
64	SKIP-Channel CH - 3	40064	INT	0	1	R/W	
65	SKIP-Channel CH - 4	40065	INT	0	1	R/W	
66	RLY Latch	40066	INT	0	1	R/W	T – 11
67	RLY Group	40067	INT	0	2	R/W	T – 12
68	Scan Rate	40068	INT	1	250	R/W	
69	Auto CJC	40069	INT	0	1	R/W	
70	Fix CJC	40070	INT	0	60.0	R/W	
71	Machine ID	40071	INT	1	247	R/W	
72	Baud Rate	40072	INT	0	1	R/W	T- 13
73	Parity/Stop Bit	40073	INT	0	3	R/W	T -14
74	Timeout	40074	INT	10	60	R/W	
75	PV Scale Retransmission	40075	INT	0	1	R/W	T -15
76	Retransmission Type	40076	INT	0	4	R/W	T-16
77	Retransmission Direction	40077	INT	0	1	R/W	T-17
78	Retransmission CH - 1	40078	INT	0	1	R/W	
79	Retransmission CH - 2	40079	INT	0	1	R/W	
80	Retransmission CH - 3	40080	INT	0	1	R/W	
81	Retransmission CH - 4	40081	INT	0	1	R/W	
82	Retransmission Value	40082	INT	0	2	R/W	T-18
83	Unused	40083	INT	1	4	R/W	
84	Password	40084	INT	0	9999	R/W	
85	DO (Relay) Modbus Operation	40085	INT	0	1	R/W	T-19
86	DO (Relay) Modbus Timeout	40086	INT	0	255	R/W	T-20
87	Serial Input Modbus Timeout	40087	INT	1	255	R/W	T-21
88	Serial Input Modbus Communication Break Display	40088	INT	0	1	R/W	T-22
89	Serial Input Modbus Ch 1	40089	INT	-1999	9999	R/W	
90	Serial Input Modbus Ch 2	40090	INT	-1999	9999	R/W	
91	Serial Input Modbus Ch 3	40091	INT	-1999	9999	R/W	
92	Serial Input Modbus Ch 4	40092	INT	-1999	9999	R/W	
93	Retransmission Output Operation	40093	INT	0	1	R/W	T-23
94	Retransmission Output Modbus Value	40094	INT	-1999	9999	R/W	

95	Retransmission Output Modbus Scale Low	40095	INT	-1999	9998	R/W	
96	Retransmission Output Modbus Scale High	40096	INT	-1998	9999	R/W	
97	Retransmission Output Modbus Timeout	40097	INT	0	255	R/W	T-24
98	Retransmission Output Modbus Predefine Value	40098	INT	0	1	R/W	T-25

Sr. No.	**Parameter**	**Absolute Address**	**Parameter Type**	**Min Value**	**Max Value**	**Access Type**	**NOTE**
1	Calibration Password	49001	INT	0	65000	W	
2	Ambient Calibration	49002	INT	-	-	W	
3	Zero Calibration Channel-1	49003	INT	-	-	W	
4	Zero Calibration Channel-2	49004	INT	-	-	W	
5	Zero Calibration Channel-3	49005	INT	-	-	W	
6	Zero Calibration Channel-4	49006	INT	-	-	W	
7	Unused	49007	INT	-	-	-	
8	Unused	49008	INT	-	-	-	
9	Unused	49009	INT	-	-	-	
10	Unused	49010	INT	-	-	-	
11	Span Calibration Channel-1	49011	INT	-	-	W	
12	Span Calibration Channel-2	49012	INT	-	-	W	
13	Span Calibration Channel-3	49013	INT	-	-	W	
14	Span Calibration Channel-4	49014	INT	-	-	W	
15	Unused	49015	INT	-	-	-	
16	Unused	49016	INT	-	-	-	
17	Unused	49017	INT	-	-	-	
18	Unused	49018	INT	-	-	-	

Modbus Parameter Details for Read Output Status Register:

SR. NO.	**Parameter**	**Absolute Address**	**Parameter Type**	**Access Type**
1	Alarm.1 Channel-1	1	BIT	R
2	Alarm.1 Channel-2	2	BIT	R
3	Alarm.1 Channel-3	3	BIT	R
4	Alarm.1 Channel-4	4	BIT	R
5	Alarm.2 Channel-1	5	BIT	R
6	Alarm.2 Channel-2	6	BIT	R
7	Alarm.2 Channel-3	7	BIT	R
8	Alarm.2 Channel-4	8	BIT	R

9	Alarm.3 Channel-1	9	BIT	R
10	Alarm.3 Channel-2	10	BIT	R
11	Alarm.3 Channel-3	11	BIT	R
12	Alarm.3 Channel-4	12	BIT	R
13	Alarm.4 Channel-1	13	BIT	R
14	Alarm.4 Channel-2	14	BIT	R
15	Alarm.4 Channel-3	15	BIT	R
16	Alarm.4 Channel-4	16	BIT	R
17	RELAY STATUS-1	17	BIT	R
18	RELAY STATUS-2	18	BIT	R
19	RELAY STATUS-3	19	BIT	R
20	RELAY STATUS-4	20	BIT	R
21	Auto/Manual Mode	21	BIT	R/W
22	Acknowledge Status	22	BIT	W
23	Unused	-	-	-
24	Unused	-	-	-
25	RELAY -1 M.bus	25	BIT	R/W(1-ON,0-OFF)
26	RELAY -2 M.bus	26	BIT	R/W(1-ON,0-OFF)
27	RELAY -3 M.bus	27	BIT	R/W(1-ON,0-OFF)
28	RELAY -4 M.bus	28	BIT	R/W(1-ON,0-OFF)

NOTE: For Auto/Manual Mode, to set Manual mode bit value = 1 and to set Auto mode bit value = 0 and For Relay-1 M.bus to Relay-4 M.bus Relay get energize = 1 and Relay gets open = 0 and Write from Address 25 to 28 will work in FC 5 Single Coil Write and FC 15 Write Multiple Coils.

INPUT TYPE SELECTION TABLE :(T – 1)

Input Type	I/P no	Type Display	Zero	Span	Resolution
E	1	E tc	-200	1000	0.1°C
J	2	J tc	-200	1200	0.1°C
K	3	K tc	-200	1370	0.1°C
T	4	T tc	-200	400	0.1°C
B	5	B tc	450	1800	1°C
R	6	R tc	0	1750	1°C
S	7	S tc	0	1750	1°C
N	8	n tc	0	1300	0.1°C
RTD	9	RTD	-199.9	850.0	0.1°C
-10 to 20mv	10	-10.20	-1999	9999	1 Count
0-75mV	11	0-75	-1999	9999	
0-100mV	12	0-100	-1999	9999	
0 to 2V	13	0-2V	-1999	9999	
0.4 to 2V	14	0.4-2V	-1999	9999	
4 TO 20mAmp	15	4-20	-1999	9999	
0 to 20 mAmp	16	0-20	-1999	9999	
0-5V	17	0-5V	-1999	9999	
1-5V	18	1-5V	-1999	9999	
0-10V	19	0-10V	-1999	9999	
SI(Serial Input Modbus RS-485)	20	SI	-1999	9999	1 Count

masibus
A Sonepar Company

Relay Logic (T – 2):

Modbus Index	Parameter Value
0	Normal
1	Fail Safe

Relay Operation (T – 3):

Modbus Index	Parameter Value
0	Alarm
1	Control Output

Relay Function (T – 4):

Modbus Index	Parameter Value
0	Alarm
1	Trip

Relay Group - 4 selections (T – 6):

Modbus Index	Parameter Value
0	None
1	G-1(RELAY – 1)
2	G-2(RELAY – 2)
3	G-3(RELAY – 3)
4	G-4(RELAY – 4)

Relay Open sensor (T – 5):

Modbus Index	Parameter Value
0	Down
1	Up

Relay Group 2 selections (T – 7):

Modbus Index	Parameter Value
0	None
1	G - 1(RELAY 1 & 3)
2	G – 2(RELAY 2 & 4)

Relay Group 1 selections(T-8):

Modbus Index	Parameter Value
0	None
1	G - 1(RELAY 1,2,3& 4)

Relay Type for Group – 4 and 1 (T - 9):

Modbus Index	Parameter Value
0	Low ON
1	High ON

Relay Type for Group – 2(T – 10):

Modbus Index	Parameter Value
0	High/Very High
1	Low/Very Low
2	High/LOW

Relay Latch selection (T – 11):

Modbus Index	Parameter Value
0	OFF
1	ON

Relay Group Selection (T – 12):

Modbus Index	Parameter Value
0	Relay Per Group – 4
1	Relay Per Group – 2
2	Relay Per Group – 1

Baud Rate for Communication (T – 13):

Modbus Index	Parameter Value
0	9600bps
1	19.2kbps

Parity/Stop Bit Selection (T – 14):

Modbus Index	Parameter Value
0	Parity-None/Stop Bit - 1
1	Parity-None/Stop Bit - 2
2	Parity Odd/Stop Bit – 1
3	Parity Even/Stop Bit – 1

Retransmission OPEN sensor (T – 15):

Modbus Index	Parameter Value
0	Down
1	Up

Retransmission Type (T – 16):

Modbus Index	Parameter Value
0	0 – 20mAmp
1	4 – 20mAmp
2	0 – 5V
3	1 – 5V
4	0 – 10V

Retransmission Direction (T – 17):

Modbus Index	Parameter Value
0	Reverse
1	Direct

Retransmission Value (T – 18):

Modbus Index	Parameter Value
0	Minimum
1	Maximum
2	Average

Modbus DO Operation (T – 19):

Modbus Index	Parameter Value
0	Internal mode
1	Modbus Mode

Note(T-19): When set to M.bus (Modbus Mode /External) means all DO (Relays) can be Turn on and off through Modbus Master write and Int.r (Internal Mode) means Process Value (Physical AI Value, Modbus AI Value) Based relay logic.

DO (Relay) Modbus Operation (do.op): When set to M.bus, internal relay logic is disabled. Switching from int.r to M.bus retains the current relay status.

DO Modbus Timeout (T – 20):

Modbus Index	Parameter Value
0	Timeout Disable
1-255	Timeout Enable

DO (Relay) M.bus Timeout (Do.to): Device 8204 includes a **watchdog mechanism for Modbus communication on its digital outputs (DO)**. If no Modbus activity from the master is detected within the configured timeout interval, **all DO (relays) will switch OFF** to ensure safe operation.

• Do.to (DO Modbus Timeout):
Defines the timeout period (in seconds) for Modbus communication.

- **Range:** 1–255 seconds
- **Default:** 0 (Timeout functionality disabled)
-

Functional Behaviour:

- When Do.to = 0, timeout monitoring is disabled.
- When Do.to is set between 1 and 255, if no Modbus command is received within this period, the device **turns OFF all DO (relays) immediately** after the timeout expires.

Note:

- Timeout action applies **only when DO (relays) are controlled in M.bus mode** (do.op = M.bus).
- The change takes effect during runtime when timeout expires.

Modbus Communication DO Timeout Functionality Example

The following example demonstrates the working of Do.to:

Step No.	Step Description	DO (Relay) Status
1	Set Do.to = 20 sec	Timeout enabled
2	Power Reset device; Do Relays controlled by Modbus master	Current Modbus Communication state active
3	Modbus master writes DO1 = ON, DO2 = ON	DO1 = ON, DO2 = ON
4	Assume there is no Modbus Communication for 20 seconds (time out occurs)	All DOs turn OFF

Serial Input Modbus Timeout (T – 21):

Modbus Index	Parameter Value
1-255	Timeout Period

Serial Input Communication Break Display (T – 22):

Modbus Index	Parameter Value
0	"Last Serial Input PV " on Display on Serial Input Communication Break.
1	"----" on Display on Serial Input Communication Break.

Serial Input Write Timeout (Si.to):
And Serial Input Communication Break Display (c.b.d.p) :

Device 8204 monitors Modbus Write on Serial Input **(Si)** channels. If the timeout period is reached without Modbus Write activity at Serial Input **(Si)** channels, a **communication break condition** is triggered, and the display/action is determined by the **c.b.d.p** setting.

• Si.to (Serial Input Write Timeout):

Defines the timeout period (in seconds) for Modbus write activity on Si-enabled channels.

- **Range:** 1–255 seconds
- **Default:** 30 (Timeout enabled)

• c.b.d.p (Communication Break Display):

Specifies how the channel behaves when a timeout occurs:

- **0 =** (Default) **Last Value:** Display blinks the last valid value; channel operation remains unaffected.
- **1 = ----:** Channel is treated as Open Sensor, display shows "----", and channel operation is affected.

Note:

- Communication break behaviour applies only to channels with **input type = Si**.

Modbus Communication Break Functionality Example 1:

The following example 1 demonstrates how Si.to and c.b.d.p work:

Step No.	Step Description	Display / Channel Status
1	Set Si.to = 30 sec, c.b.d.p = 0 (Last Value)	Last value displayed without blinking until modbus writes for first time on Si channel.
2	Si channel starts Showing range low value (Example: -1999)	Shows range low value of Si Channel.
3	Modbus master writes new value on Si channel = 150	Si channel Display shows 150.
4	No Modbus write for 30 sec (timeout occurs).	Display continues blinking last value (150), operation unaffected
5	If c.b.d.p was set to 1 (----) instead	Display shows "----", channel treated as Open Sensor and value 32767 in Input Register.

Modbus Communication Break Functionality Example 2:

The following example 2 demonstrates how Si.to and c.b.d.p work on Powering up:

Step No.	Step Description	Display / Channel Status
1	Set Si.to = 30 sec, c.b.d.p = 1 (----)	(----) value displayed without blinking until modbus writes for first time on Si channel.
2	Power up device (Power Reset Device); Si channel starts with Open value.	Shows Open value on Si Channel.(But Open Value Operation Will only came in to Effect if Si Channel Value is Write Once)
3	Modbus master writes new value on Si channel = 150	Si channel Display shows 150.
4	No Modbus write for 30 sec (timeout occurs).	Display shows "----", channel treated as Open Sensor and value 32767 in Input Register And operation affected on Channel

Retransmission Output Operation (T – 23):

Modbus Index	Parameter Value
0	Internal Mode
1	Modbus Mode

Note(T-23): When set to M.bus (Modbus Mode /External) means Modbus Retransmission output Mode(M.bus) operate based on Modbus Master write Value and Int.r (Internal Mode) means Process Value (Physical AI Value, Modbus AI Value) Based Retransmission Output.

Retransmission Modbus Operation (rt.op): Retransmission Modbus Operation (rt.op): When set to M.bus, process value-based retransmission output is disabled. Switching from int.r to M.bus retains the current Retransmission Output value, and

the Power Reset startup output is determined by **rt.pv** (Retransmission Output Predefine Values).

Retransmission Output Modbus Timeout (T – 24):

Modbus Index	Parameter Value
0	Timeout Disable
1-255	Timeout Enable

Retransmission Output Modbus Predefine Value (T – 25):

Modbus Index	Parameter Value
0	RTR Modbus Scale Low
1	RTR Modbus Scale High

Retransmission Timeout (rt.to) and Predefine Value (rt.pv): Device 8204 uses a watchdog mechanism for Modbus communication on its Modbus retransmission output. If there is no Modbus communication from the master within the configured timeout interval, the Retransmission output will switch to a **predefined value**.

- **rt.to (Retransmission Output Timeout):**
  This parameter sets the timeout period (in seconds) for Modbus communication on the retransmission channel. Range: 1–255 seconds. Default = 0, meaning the timeout functionality is disabled.
- **rt.pv (Retransmission Output Predefine Value):**
  Defines the value to be output when a timeout occurs.
  - 0 = Retransmission output will switch to RTR Modbus Scale Low.
  - 1 = Retransmission output will switch to RTR Modbus Scale High.

Note:

- **These parameters take effect on power cycle or when timeout event occurs.**
- **Retransmission timeout action applies only when rt.op = M.bus mode is selected.**

Modbus Communication Retransmission Timeout Functionality:

The following example demonstrates how **rt.to** and **rt.pv** work:

Step No.	Step Description	Retransmission Output
1	Set rt.to = 10 sec, rt.pv = 1(Scale High)	Scale High Counts (9999) → 20 mA
2	Initial Retransmission output value follows predefine state until Modbus write	Predefine Value (9999) → 20 mA
3	Modbus master updates retransmission modbus value to -1999	4 mA generated (if Scale Low = -1999)
4	No Modbus communication for 10 seconds	Output changes to RTR Scale High (9999) → 20 mA
5	Instead if rt.pv = 0(Scale Low) and rt.to Reaches Timeout	Output changes to RTR Scale Low (-1999) → 4 mA

12. Miscellaneous :

PV INPUT STATUS DISPLAY DURING BURNOUT CONDITION:

Input type	Display Message
TC-E	OPEN(**oPEn**)
TC-J	OPEN
TC-K	OPEN
TC-T	OPEN
TC-N	OPEN
TC-B	OPEN
TC-R	OPEN
TC-S	OPEN
PT 100(RTD)	OPEN
0-10V DC	OPEN
0 to 5V DC	OPEN
1 to 5V DC	OPEN
0 to 2V DC	OPEN
0.4 to 2V DC	OPEN
0 to 20mAmp	PV LOW
4 to 20mAmp	PV LOW
-10 to 20mV DC	OPEN
0-100mV DC	OPEN
0-75mV DC	OPEN
SI	**----** (OPEN)

Table 1

Note: If set PV_low/PV_high for input type is less then maximum value of zero and span for then process value will display readings above 5% of display range, then after it will show **oVER/UnDR** (OVER/UNDER) message until value crosses maximum value of Sensor range. **OVER/UNDER condition is applicable for TC and RTD input types only**. Process value greater then maximum value of zero/span then display will show **oPEn** (OPEN) message. Retransmission o/p(Retransmission is optional) will follow 5% of display range and then it will give fixed o/p depending up on OPEN sensor selection. In case of linear inputs scaling is applied then during OPEN sensor condition it may not show **oPEn** (OPEN) message instead it will show either **oVER/UnDR** (OVER/UNDER).

RETRANSMISSION OUTPUT TABLE FOR OPEN /OVER /UNDER CONDITION:

RETRANSMISSION	VARIABLE	SCALE	ACTION	OPEN	OVER	UNDER	ERROR
4-20mAmp	PV	UP	DIR	20.8	20.8	3.2	-
	PV	DOWN	REV	20.8	3.2	20.8	-
	PV	UP	REV	3.2	3.2	20.8	-
	PV	DOWN	DIR	3.2	20.8	3.2	-

Table 2

NOTE: - 1) For Retransmission output type 0-20mAmp, 0-10v, 1-5v and 0-5v also applicable according to above table.

2) Also, 0-20mAmp, 0-10v and 0-5v minimum output value will be 0mAmp and 0v respectively.

3) More than one channel can be selected for Retransmission, but output depends on Maximum reading or Minimum reading or Average reading from the no of channel. Retransmission output Maximum, Minimum and Average can be selected from Level-3.