



MODBUS Master / Slaves protocol

MODBUS is a Master-Slaves protocol. Only one master (at the same time) is connected to the bus, and one or several (247 maximum number) slaves nodes are also connected to the same serial bus. A MODBUS communication is always initiated by the master. The slave nodes will never transmit data without receiving a request from the master node. The slave nodes will never communicate with each other. The master node initiates only one MODBUS transaction at the same time. The master node issues a MODBUS request to the slave nodes in two modes: In unicast mode, the master addresses an individual slave (from 1 to 247). After receiving and processing the request, the slave returns a reply to the master. In broadcast mode, the master can send a request to all slaves. No response is returned to broadcast requests sent by the master. The broadcast requests are necessarily writing commands. All devices must accept the broadcast for writing function. The address 0 is reserved to identify a broadcast exchange.

RTU Transmission Mode

When devices communicate on a MODBUS serial line using the RTU (Remote Terminal Unit) mode, each 8-bit byte in a message contains two 4-bit hexadecimal characters.

The format for each byte in RTU mode is:

Coding System: 8-bit binary

Bits per Byte: 1 start bit
8 data bits, least significant bit sent first
1 bit for parity completion
1 stop bit

Even parity is required, other modes (odd parity, no parity) may also be used. In order to ensure a maximum compatibility with other products, it is recommended to support also No parity mode. The default parity mode must be even parity.

Remark: the use of no parity requires 2 stop bits.

Setting Modbus parameters from TX-i40 display

- Long press of the SET key to enter in the USER level.
- Scroll to Par menu using UP or DOWN keys and press SET to access.
- Scroll to PG parameters and press SET.
- Scroll to the parameters listed in the table below, press SET to modify and scroll up or down to select the required value, press SET to confirm.

Parameter	Description	Assignable values
G03	Device address	0 From 1 to 247
G04	Baud rate	0 = 2400 1 = 4800 2 = 9600 3 = 19200
G05	Parity bit	0 = none 1 = odd 2 = even
G06	Stop bits	0 = 1 stop bit 1 = 2 stop bits

Factory Modbus parameters

G03 is factory set to 0 and G04-G05-G06 are disabled.

Default parameters are:

- Device address = 247
- Baud rate = 19200
- Parity bit = even
- Stop bits = 1 stop bit



STATUS							
Item	Label	Modbus Addr (Base 0)	Modbus Addr (Base 1)	Modbus Access	Measure unit	Inf	Sup
Status							
Unit Status	S02	0501h	HR:1282	RW		0=ON	2=Stand-by by Digital Input
					0	ON	
					1	Stand-by	
					2	Stand-by by Digital Input	
On Alarm	S03	0502h	HR:1283	RW		0=Off	1=On
Working Hours							
Compressor Working Hours	S15	050Eh	HR:1295	RW	h*10		
Evaporator Fan Working Hours	S21	0514h	HR:1301	RW	h*10		
Condenser Fan Working Hours	S23	0516h	HR:1303	RW	h*10		
Filter Working Hours	S99	058Fh	HR:1424	RW	h*10		
I/O							
Item	Label	Modbus Addr (Base 0)	Modbus Addr (Base 1)	Modbus Access	Measure unit	Inf	Sup
Analog Inputs							
Condenser NTC Probe Temperature*	IN1	0201h	HR:514	R	°C-°F (0.1 resolution)		
Evaporator inlet air NTC Probe Temperature	IN2	0202h	HR:515	R	°C-°F (0.1 resolution)		
Ambient air NTC Probe Temperature*	IN3	0203h	HR:516	R	°C-°F (0.1 resolution)		
Digital Inputs							
Condenser NTC Probe Status*	DI1	0101h.Bit0	HR:258.Bit0	R		0=Off	1=On
Evaporator inlet air NTC Probe Status	DI2	0101h.Bit1	HR:258.Bit1	R		0=Off	1=On
Ambient air NTC Probe Status*	DI3	0101h.Bit2	HR:258.Bit2	R		0=Off	1=On
Digital input External Alarm Status	DI4	0101h.Bit3	HR:258.Bit3	R		0=Off	1=On
Phase sequence relay Status*	DI5	0101h.Bit4	HR:258.Bit4	R		0=Off	1=On
Compressor overload protection Status*	DI6	0101h.Bit5	HR:258.Bit5	R		0=Off	1=On
High pressure switch Status*	DI7	0101h.Bit6	HR:258.Bit6	R		0=Off	1=On
Digital Outputs							
General alarm relay Status	DO1	0181h.Bit0	HR:386.Bit0	R		0=Off	1=On
Evaporator fan relay Status	DO2	0181h.Bit1	HR:386.Bit1	R		0=Off	1=On
Condenser fan relay Status	DO3	0181h.Bit2	HR:386.Bit2	R		0=Off	1=On
Compressor relay Status	DO4	0181h.Bit3	HR:386.Bit3	R		0=Off	1=On
PARAMETERS							
Item	Label	Modbus Addr (Base 0)	Modbus Addr (Base 1)	Modbus Access	Measure unit	Inf	Sup
Setpoint							
Cooling mode setpoint	Coo	0600h	HR:1537	RW	°C-°F	20	45
General							
Measurement Unit	G07	060Ah	HR:1547	RW		0=Celsius/Bar	1=Fahrenheit/Psi
Enable Sequencing	G20	0617h	HR:1560	RW		0=Off	1=On
Alarm							
High/Low Control Temperature Alarm Differential	A16	062Ch	HR:1581	RW	K-R (0.1 resolution)	0.0	59.9
High/Low Control Temperature Alarm Mode	A86	06E2h	HR:1763	RW		0=Relative	1=Absolute
Absolute High Control Temperature Alarm Setpoint Cooling Mode	A87	06E3h	HR:1764	RW	°C-°F	-58	199
Absolute Low Control Temperature Alarm Setpoint Cooling Mode	A88	06E4h	HR:1765	RW	°C-°F	-58	199
Maximum Filter Working Hours	A91	06F5h	HR:1782	RW	h*10	0=Disabled	9999



Regulation							
Cooling mode control band	r01	0687h	HR:1672	RW	K-R (0.1 resolution)	0.0	99.9
ALARMS							
Item	Label	Modbus Addr (Base 0)	Modbus Addr (Base 1)	Modbus Access	Measure unit	Inf	Sup
High regulation temperature Alarm	Hrt	0303h	HR:772	R			
Phase sequence Alarm*	PH	0305h	HR:774	R			
Generic Alarm	ALL	0309h	HR:778	R			
Expansion communication Alarm	CoM	030Dh	HR:782	R			
Working hours Alarm	Hou	030Eh	HR:783	R			
Low Control Temperature Alarm	Lrt	030Fh	HR:784	R			
High pressure Alarm*	HP1	0311h	HR:786	R			
Compressor thermal overload Alarm*	t1	0317h	HR:792	R			
Condenser NTC Probe Error*	A01	0331h	HR:818	R			
Evaporator inlet air NTC Probe Error	A02	0332h	HR:819	R			
Ambient air NTC Probe Error*	A03	0333h	HR:820	R			

*If available