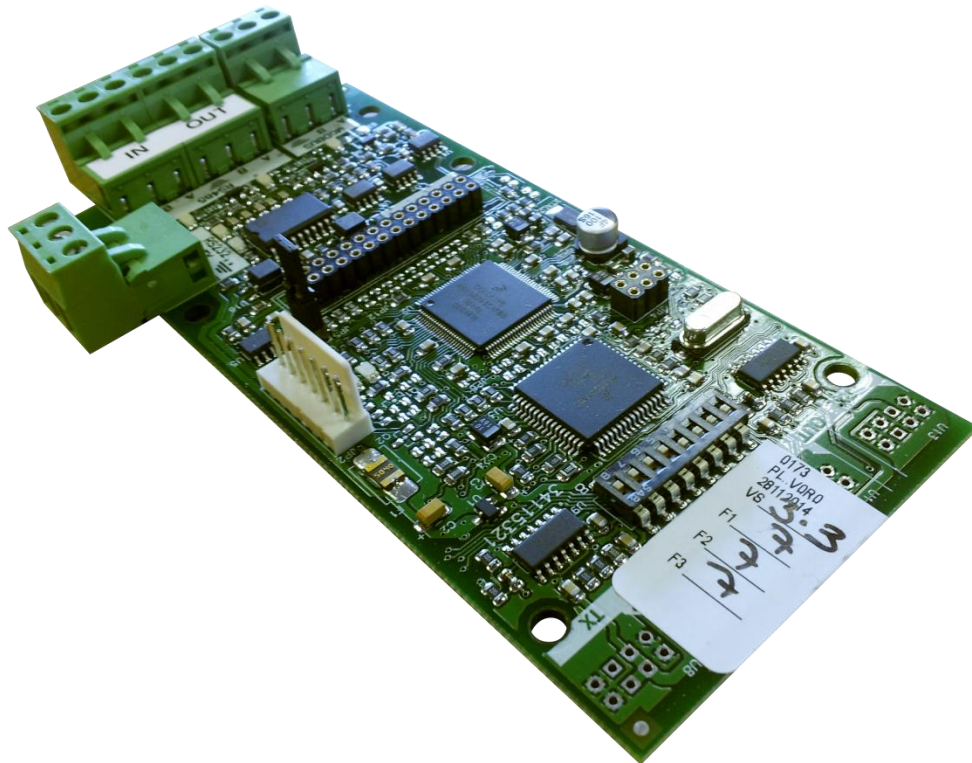# MODBUS REGISTERS FOR QUATRO ADDRESSABLE PANEL

Modbus Protocol

Modbus is a standard communication protocol used in a wide range of industrial equipment. It allows the connection of multiple devices, in a master/slave topology. Multiple slaves can share the same bus, but only one master can be in the line at the same time. The master can communicate with a specific device (peer to peer) or with broadcast frames.

Modbus defines the communication format, including command, data and checksum. Quatro Modbus uses RTU frames. These frames use silences of 3.5 chars, and a CRC of 16 bits. Data size is 8 bits.

Quatro Modbus implements the format specified in the next table:

|	
Start	3.5 Char time
Device Address	8 Bits
Function	8 Bits
Data	n x 8 Bits
CRC	16 Bits
End	3.5 Char time

Modbus Frame Format

Quatro Modbus accepts the reading of (0x04) and writing of (0x10) commands. These commands bits affect 16-bits registers.

In the following table you can see the data field format. It will always contain the base register address, and the quantity of data to be read or written. If it's a writing command, it also includes the data to be written. All data is send using big-endian (most significant byte first).

Register base address	Number of registers to be read or written	Data (only for write commands)
High Address Byte, Low Address Byte	High size byte, Low size byte	Data, from 0 to 2*size bytes

Modbus Wiring
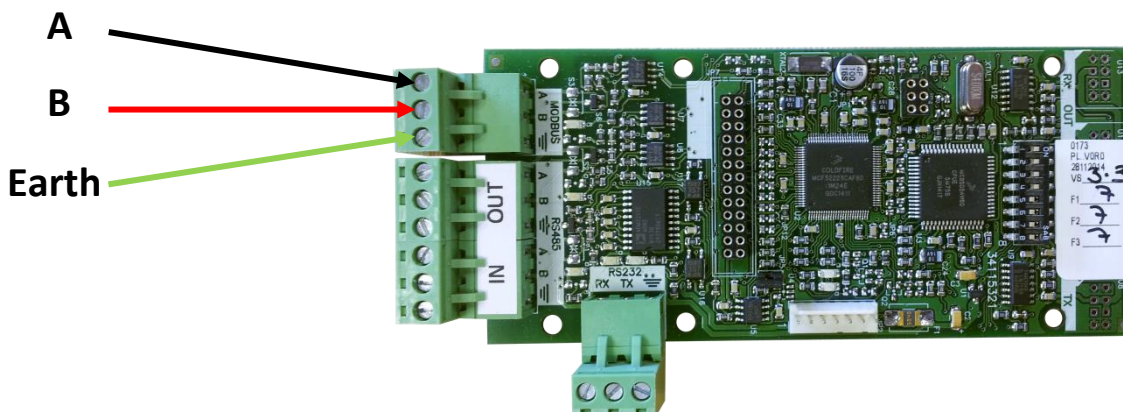
Configuration of Modbus Testing Applications

(Note: A RS-485 USB to Serial Adapter will be required to use the Modbus with a testing application)

Below are the recommended settings to be used with your Modbus testing application:

Connection	Serial Port
Interface	RS485
Mode	RTU
Baud Read Speed	9600
Data Bits	8
Parity	None
Stop Bits	1
Response Timeout	1000ms
Delay Between Polls	200ms

General Information Registers

These registers contain general panel information, like software versions and type of panel.

Address	Description	R/W	Bit[15:8]	Bit[7:0]	Info
0x0000	Modbus state	R		State	1 means Modbus is connected
0x0001	Type of panel	R		Type	Control panel max number of loops
0x0002	Panel version	R	Version		Panel software version
0x0003	Network version	R	Version		Network software version
0x0004	Modbus version	R	Version		Modbus software version
0x000D..0x001F	Reserved / Unused	R	Reserved		*(Reserved)*

Panel Status Registers

The following registers are used to get panel current status. It also includes virtual keys to interact remotely from the panel.

Address	Description	R/W	Bit[15:8]	Bit[7:0]	Info
0x0020	Panel status	R	General status		Bit 0: Panel muted. Bit 1: Sounders ON

				Bit 2: Sounders OFF Bit 3: Zone in test mode Bit 4: Zone disabled. Bit 5: Sounders disabled. Bit 6: Sounders delayed. Bit 7: Outputs disabled.
0x0021	Fault information	R	Faults in panel	Bit 0: Panel in fault Bit 1: Power fault Bit 2: Fault in PCB (PCB Sounders...) Bit 3: Loops in fault Bit 4: Any device in fault Bit 5: Network fault [not implemented yet]
0x0022	Alarm information	R	Alarms in panel	Bit 0: Panel In Alarm (internal) Bit 1: Panel in alarm (external) Bit 2: MCP in alarm in panel
0x0023	Reserved	R	Unused	*(Reserved)*
0x0024	Virtual key register	R/W	key	Val = 1 -> RESET Val = 2 -> MUTE Val = 3 -> SOUNDERS ON Val = 4 -> SOUNDERS OFF
0x0025	Power status	R	Status	Bit 0: Power fault Bit 1: Ground fault
0x0026	PCB Sounder 1 Status	R	Status	Bit 0: Open Bit 1: Off Bit 2: Short Bit 3: On
0x0027	PCB Sounder 2 Status	R	Status	Bit 0: Open Bit 1: Off Bit 2: Short Bit 3: On
0x0028	Fault Relay	R	Status	Bit 0: Idle Bit 1: Activated
0x0029	Alarm Relay	R	Status	Bit 0: Idle Bit 1: Activated
0x002A	Number of faults in panel	R	Fault counter	Zones in fault counter
0x002B	Number of alarms in panel	R	Alarms counter	Zones in alarm counter
0x002C...0x4F	Reserved	R	Reserved	*(Reserved)*

Loop Status Registers

Following registers contain loop status

Address	Description	R/W	Bit[15:8]	Bit[7:0]	Info
0x0050	Loop status 1	R	Status		Bit 0: Loop quiescent Bit 1: Open loop fault Bit 2: Short loop fault Bit 3: Loop communication lost
0x0051	Loop status 2	R	Status		Bit 0: Loop quiescent Bit 1: Open loop fault Bit 2: Short loop fault Bit 3: Loop communication lost
0x0052	Loop status 3	R	Status		Bit 0: Loop quiescent Bit 1: Open loop fault Bit 2: Short loop fault Bit 3: Loop communication lost
0x0053	Loop status 4	R	Status		Bit 0: Loop quiescent Bit 1: Open loop fault Bit 2: Short loop fault Bit 3: Loop communication lost
0x0054	Loop status 5	R	Status		Bit 0: Loop quiescent Bit 1: Open loop fault Bit 2: Short loop fault Bit 3: Loop communication lost
0x0055	Loop status 6	R	Status		Bit 0: Loop quiescent Bit 1: Open loop fault Bit 2: Short loop fault Bit 3: Loop communication lost
0x0056	Loop status 7	R	Status		Bit 0: Loop quiescent Bit 1: Open loop fault Bit 2: Short loop fault Bit 3: Loop communication lost
0x0057	Loop status 8	R	Status		Bit 0: Loop quiescent Bit 1: Open loop fault Bit 2: Short loop fault Bit 3: Loop communication lost

Network Status Registers

Following registers contain the status of the network of Quatro panels.

Address	Description	R/W	Bit[15:8]	Bit[7:0]	Info
0x0080	Node configuration	R	Node type	Address	*(Not Implemented Yet)*
0x0081	Network status	R	Status		*(Not Implemented Yet)*
0x0082	Network topology	R	Topology	Number of nodes	*(Not Implemented Yet)*

Zone status registers

These registers contain the zones status

Address	Description	R/W	Bit[15:8]	Bit[7:0]	Info
0x0100-0x01FA	Zone status (1..250)	R	Mode	Status	LOW BYTE = Bit 0: Fault Bit 1: Alarm HIGH BYTE = Value = 1 Normal Value = 0 Disabled Value = 2 Test

Reading the Bytes

Byte (2 Hex Digits)	Meaning
First	Device address (always the same)
Second	Read or write command (04h Read and 10h for write)
Third & 4th	Base address of register to read
5th & 6th	Number of bytes or registers (bytes * 2) to read
LAST 2	BYTE CRC
ANY OTHERS	Read info, if any