

MODBUS TCP/IP FOR MID MIDEXX Controller

Requierment

- *MID Wi-Fi Board
- *Wireless Network Router

MODBUS PROTOCOL

The protocol defines a simple application data unit (ADU) and a Modbus packet format. The ADU consists of a Modbus application header (MBAP) and a protocol data unit(PDU).

Table 1 : MBAP

BYTE Number	Description
0-1	Transaction ID(TID)- Keeps track of Modbus packets
2-3	Protocol ID - 0 For Modbus protocol
4-5	*Request: Length of data to follow including the unit identification(UID),function code and the data. *Response: Length of data to follow including the unit identification(UID),function code, byte count and the data.
6	Unit Identification - Remote server ID

Table 2 : PDU

BYTE Number	Description
7	Function Code (Fcode) - Modbus Command.
8	Data

MIDEXX REGISTERS

Midexx Wi-Fi board only accepts and replies to one function code which is *Read Input Registers* (Fcode = 0x04). Any request with a function code other than *Read Input Register* will return an Error code. There are 24 data input registers (0x18) that contain Midexx status information, and each register is made of 2 bytes. These registers are defined below in Table 3.

Table 3 : Midexx Status Information Registers

Register Number	Name	Range	Number of Byte	Number of Decimal	Description
0x0000	Status	0x0000	1	0	See Table 4
0x0001	Alarm	0x0001	1	0	See Table 5
0x0002	Pump Setting	0x0002	1	0	See Table 6
0x0003	Operation Mode	0x0003	1	0	"0" = Injection , "1" = Extrusion
0x0004	Software Version	0x0004	1	2	Midexx Software Version
0x0005	Low Level Weight	0x0005	1	1	The weight setpoint at Which alarm is triggered
0x0006	Serial Number	0x0006	2	0	Midexx serial number
0x0007	Regrind	0x0007	2	1	Percentage Of regrind , Unit= %
0x0008	Shot Size	0x0008 - 0x0009	4	1	Total size of injection , Unit= gr

0x000A	Product Rate	0x000A-0x000B	4	1	The rate of extrusion production, Unit = Kg/hr
0x000C	LDR	0x000C-0x000D	4	3	Let Down Ratio , Unit = %
0x000E	Sample Weight	0x000E	2	1	Thr weight of calibration sample
0x000F	Time Interval	0x000F	2	0	Internal Timer to replace signal recovery time 0.5 - 99.9 Seconds
0x0010	Inventory	0x0010-0x0011	4	0	Accumelated amount of colour pumped
0x0012	Container Weight	0x0012	2	1	Container weight for Volumetric mode only
0x0013	Container Weight_HR	0x0013-0x0014	4	4	High resolution value representing container weight in Gravimetric mode only.
0x0015	Ext.Out Signal	0x0015	2	0	0-10 volt mapped to 0-4096 represinting Follow up Signal
0x0016	RPM	0x0016-0x0017	4	1	Speed of motor RPM

STATUS, ALARM, PUMP SETTINGS REGISTERS MAPS

Status register is a one byte register that is made of 8 bits, where each bit represent different status. These statuses are described in table 4 below.

Table 4 : Status Register

BIT #	Name	Description
0	Use Re grind	Re grind Signal ("1" = ON , "0" = OFF)
1	Use Signal	Screw Recovery Signal ("1" = ON , "0" = OFF)
2	Changed By	"0" = Midexx , "1" = Wi-Fi Board
3	Run Mode	"1" = Start , "0" = Stop
4	Tracking	Tracking Mode ("1" = ON , "0" = OFF)
5	Prime Flag	Priming Mode ("1" = ON , "0" = OFF)
6	Not Used	Not Used
7	Not Used	Not Used

Alarm register is a one byte register that is made of 8 bits, where each bit represent different Alarm. These alarms are described in table 5 below. Please Note if a bit is equal to "1", this indicate that the alarm is ON.

Table 5 : Alarm Register

BIT #	Name	Description
0	Low Sensor	Low Level Alarm
1	High Sensor	Not Used
2	Speed High	Speed out of range High
3	Speed Low	Speed out of range Low
4	RF Channel	Not Used
5	RF Channel	Not Used
6	No Flow	No Flow Alarm
7	Not Used	Not Used

Pump Settings register is a one byte register that is made of 8 bits, where each bit indicate different setting.

Table 6 : Pump Settings

BIT #	Name	Description
0	GR/Vol	0 = Volumetric, 1 = Gravemetric
1	Motor Direction	"1" = CCW , "0" = CW
2	Not Used	Not Used
3	Not Used	Not Used
4	Not Used	Not Used
5	Not Used	Not Used
6	Not Used	Not Used
7	Not Used	Not Used

EXAMPLE

The following example illustrate a Modbus transaction, Here, The Scada System sends a request to Midexx Wi-Fi Board asking to read 5 input registers starting at address 0x0005 as shown in Table 7. The Midexx Wi-Fi Board will reply with the values of the 5 input registers as shown in Table 8.

Table 7 : Request

0	1	2	3	4	5	6	7	8	9	10	11
00	01	00	00	00	06	01	04	00	05	00	05
TID		PID		Length		UID	FCode	Starting Address		Number of Registers	
						Length = 6 Bytes					
MBAP						PDU					

Table 8 : Response

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
TID		PID		Length		UID	FCode	BYTE Count	Data									
00	01	00	00	00	0D	01	04	10	00	04	FF	C5	00	03	00	00	00	3A
									0x0005		0x0006		0x0007	0x0008	0x0009			
									Low Level Weight		Serial Number		Regrind	shot Size				
									Byte Count = 10 Bytes									
									Length = 13 Bytes									



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Revision History

Rev	Editor	Description	Approval	Date
1.0	Imad Koussan	Create document	P.M	7/24/2014
1.1	Imad Koussan	Corrected Operation mode in table 3	P.M	4/5/2015