



SPECIFICATION SHEET

Modbus RTU Slave Interface

COMMUNICATION FORMAT FOR ADI PART# AFD-H100D MODICON PLC RTU SLAVE INTERFACE:

Automation Displays Part# AFD-H100D consists of a Z-Card microcontroller card and firmware that communicates using the Modbus RTU data format as described in the Modicon Protocol Reference Guide PI-MBUS-300. The Z-Card functions as a Modbus Slave device meaning it responds to commands from the PLC master. The Z-Card can use RS-485, RS-232, or RS-422 data connections.

Ladder logic refers to the first register as #1. The Modbus data command for that register uses a binary value of 0. For convenience, this text will use the ladder logic convention.

REQUESTING SWITCH STATUS FROM THE ADI PANEL TO THE Modicon PLC:

The ADI panel responds to the "READ INPUT REGISTERS" function code 04 command to report switch status using the 3X registers in the PLC. When a switch is activated, a single bit is set. Each PLC register holds sixteen bits, so sixteen switches are stored in each register. The ADI panel maintains a memory image of all of the switches, so it is able to fill in all sixteen bits of the register.

Each switch requires a unique register bit address. For example, a switch for Fan 1.3 ON might use 3X register 1, bit 1.

CONTROLLING ADI LEDs FROM THE Modicon PLC:

The ADI panel responds to the "PRESET MULTIPLE REGISTERS" function code 16 (10 Hex) command to control LEDs from PLC commands using the 4X registers. The PLC uses two bits to represent each LED. A single 16-bit PLC register controls eight LEDs. For each LED, the two bits are encoded as follows:

00 = LED off
01 = LED on
10 = LED slow flash
11 = LED fast flash

Each LED requires a unique register bit address. For example, the first LED might use 4x register 1, bits 1 & 2. In this text, bit 1 refers to the least significant bit, and bit 16 refers to the most significant bit.

It is not practical to use a single bit per LED because steady flash rates cannot be supported.

SERIAL PORT PARAMETERS:

The serial port parameters used for the Modbus RTU protocol are 8 data bits, no parity, and 1 stop bit. Although the interface will operate at lower baud rates, you must **use 19200** baud or higher to get the best switch and LED response times.

PANEL ACTIVE LED:

The Panel Active LED is controlled by the Z-Card. When a switch (except for the Panel Disable switch) is in the closed position (not in Auto) the Panel Active LED will light. External Inputs will not affect the Panel Active LED.

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Modbus_RTU_H100D.cdr
20 April 2011

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1st SWITCH "3x" REGISTER

BIT NO.	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
SWITCH NO.	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0

2nd SWITCH "3x" REGISTER

BIT NO.	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
SWITCH NO.	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16

BIT VALUE 0 = SWITCH OFF
1 = SWITCH ON

SWITCH BITS SET BY ADI PANEL AND
POLLED BY PLC USING MODBUS RTU DATA FORMAT.

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1st LED "4x" REGISTER

BIT NO.	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
LED NO.	7		6		5		4		3		2		1		0	

2nd LED "4x" REGISTER

BIT NO.	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
LED NO.	15	14	13	12	11	10	9	8								

BIT VALUE 0 0 = LED OFF
0 1 = LED ON
1 0 = LED SLOW FLASH
1 1 = LED FAST FLASH

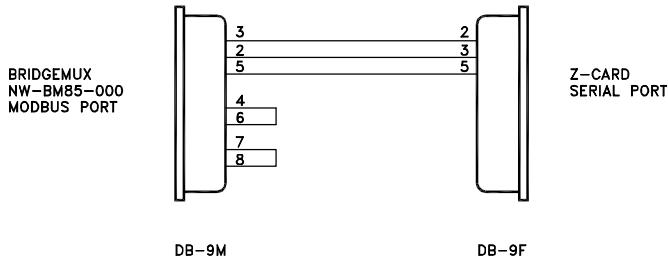
LED BITS SET BY CUSTOMER,
USING MODBUS RTU DATA FORMAT

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MODICON PORT TO ADI Z-CARD RS-232 CABLE DIAGRAM

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MODBUS PORT 1, 2, 3, OR 4.
ADDITIONAL MODBUS PLUS PORT
CONNECTS BRIDGEMUX TO PLC.

USE BRIDGEMUX IN RTU MODE, SET TO
"SLAVE" SO IT WILL EXPECT A SLAVE TO
BE CONNECTED.

PORT PARAMETERS:
8 DATA BITS,
NO PARITY,
1 STOP BIT.

USE 19.2K BAUD OR HIGHER FOR BEST
SWITCH AND LED RESPONSE TIMES.

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