MODBUS FOR ATLAS1 METERS

Description

This technical note explains the following for Atlas1 Meter:

- How to set up ModBus protocol

- How to do Register mapping

This note is based on Atlas firmware version 1.63 (see Appendix for firmware details) and EziView version 4.38.

Features

Atlas Modbus has the following features:

- Supports Modbus function 3 commands (read holding registers) only

- Compatible with Modbus RTU protocol using standard serial baud rates

- Configurable Modbus slave address

- Fixed mapping for the most commonly used registers

- Supports 32 bit data type for response

- Supports RS232 or RS485 (2-wire / 4-wire) as physical

Setting Up For Modbus

In the communications section of meter setup in EziView, configure the modem port to Modbus protocol.

Alternatively, Modbus can be configured on the SCADA port. The initialization parameters are ignored.

Ensure that the baud rate matches with the PC baud rate and the handshaking is set to Normal.

Figure 1 below shows an example of EziView meter setup for Modbus on the Modem port of the meter.
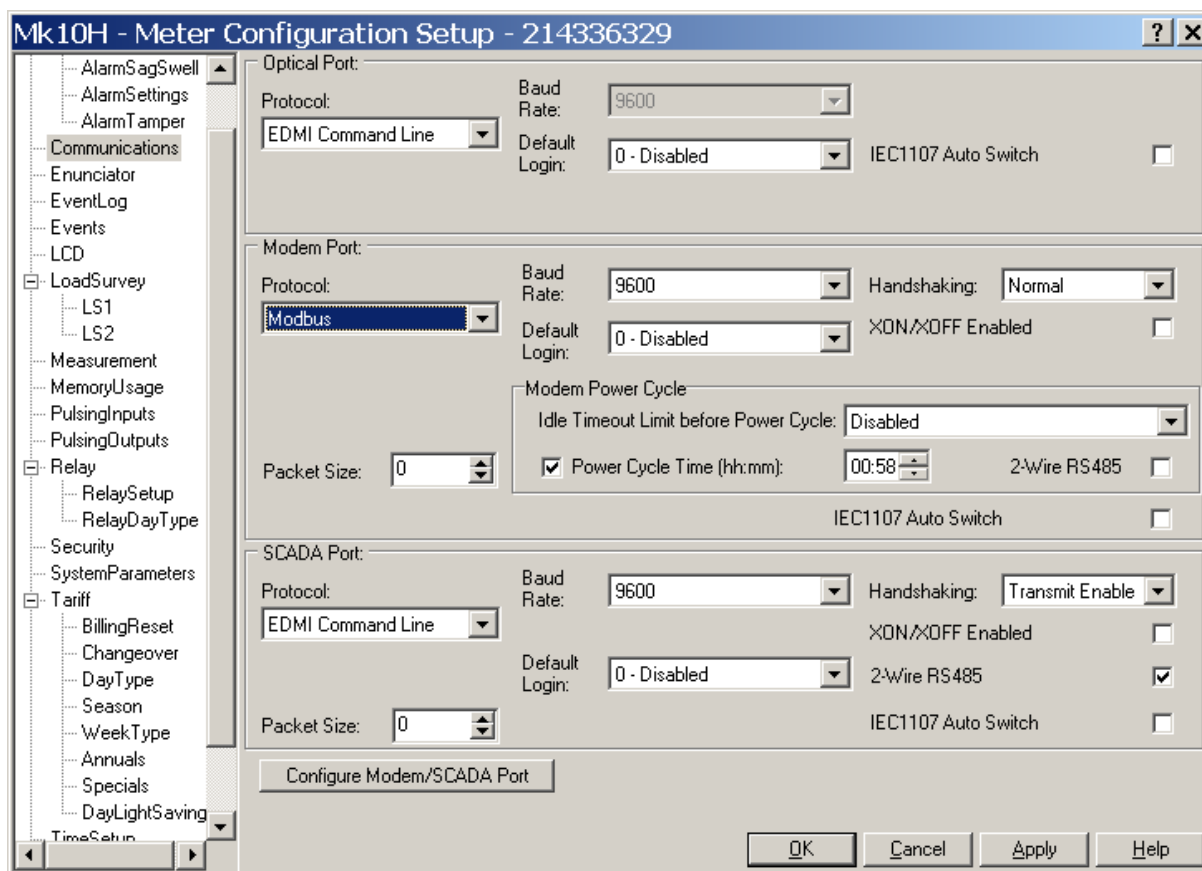
Figure 1: Communications Setup

Configuring Modbus Slave Address

Atlas meters use last 2 digits of Meter's serial number as the default slave address.

A configurable slave address relies on the Modbus user setup being present in the meter. The Modbus user needs to be named in the following format:

MODBxxx, where xxx = zero-padded device ID that ranges from 1 to 247

Figure 2 below shows an example of Modbus user for the user-configured Modbus slave address of 123.
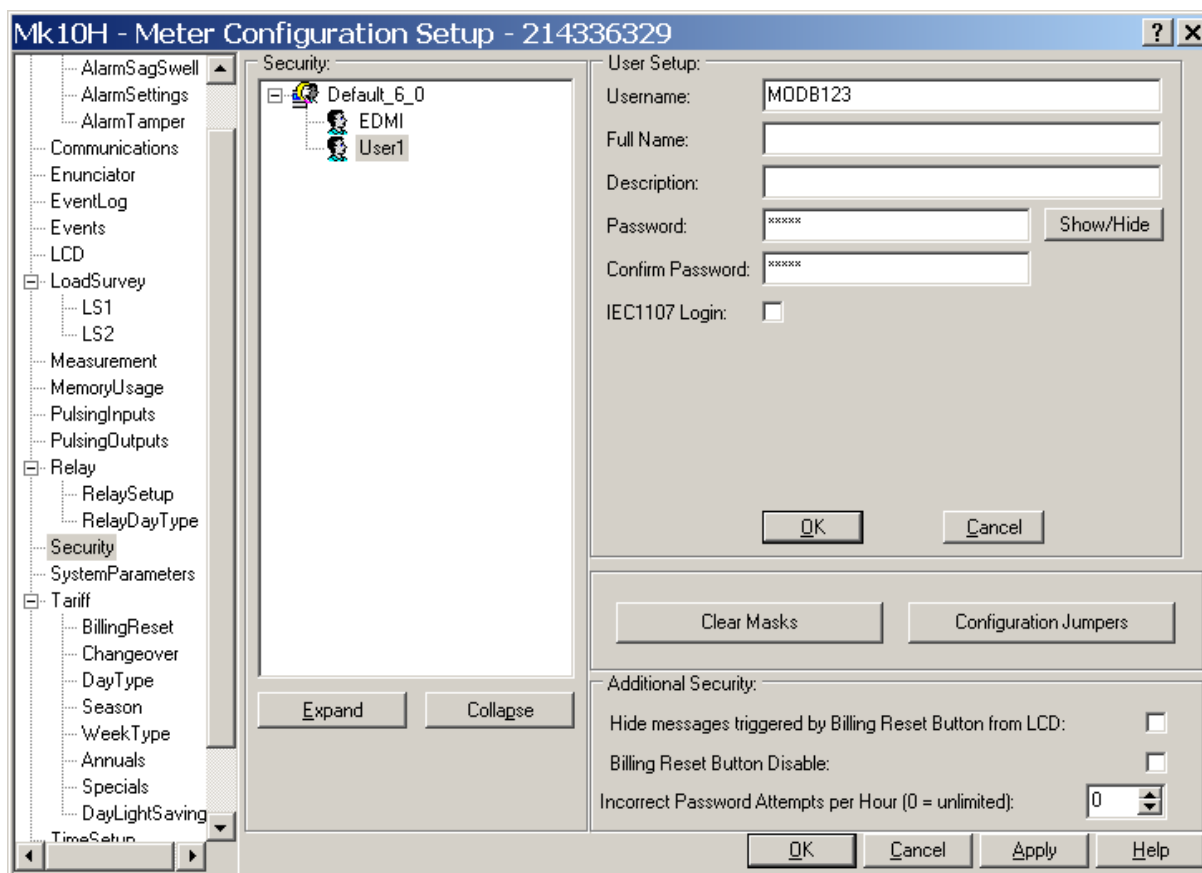
Figure 2: Security Setup

If Modbus user has not been created in the user setup of the meter, the meter firmware derives the slave address from last 2 digits of the meter's serial number.

If the last 2 digits happen to be ZERO, then the firmware assigns address 100 as the Modbus slave address.

Modbus slave address on the meter can be read or displayed on the meter LCD by reading register 0xFF04.

Modbus Registers

The table below details the EDMI register quantities available as Modbus registers. The register mapping is fixed for Atlas meters.

Read Address	Modbus Address	Modbus Size	Meter Register	Description
9002	9001	2	E000	Phase A Voltage

Read Address	Modbus Address	Modbus Size	Meter Register	Description
9004	9003	2	E001	Phase B Voltage
9006	9005	2	E002	Phase C Voltage
9008	9007	2	E010	Phase A Current
9010	9009	2	E011	Phase B Current
9012	9011	2	E012	Phase C Current
9014	9013	2	E020	Phase angle of A Phase
9016	9015	2	E021	Phase angle of B Phase
9018	9017	2	E022	Phase angle of C Phase
9020	9019	2	E030	Phase A Watts
9022	9021	2	E031	Phase B Watts
9024	9023	2	E032	Phase C Watts
9026	9025	2	E040	Phase A vars
9028	9027	2	E041	Phase B vars
9030	9029	2	E042	Phase C vars
9032	9031	2	E050	Phase A VA
9034	9033	2	E051	Phase B VA
9036	9035	2	E052	Phase C VA
9038	9037	2	E060	Frequency
9040	9039	2	E02B	Angle between VTA and VTB
9042	9041	2	E02C	Angle between VTA and VTC
9044	9043	2	E026	Power factor
9046	9045	2	F010	Date
9048	9047	2	F011	Time
9050	9049	2	FFFA	TOU delivered Wh
9052	9051	2	FFFB	TOU delivered varh
9054	9053	2	FFFC	TOU received Wh
9056	9055	2	FFFD	TOU received varh
9058	9057	2	E033	Total Watts
9060	9059	2	E043	Total var

Read Address	Modbus Address	Modbus Size	Meter Register	Description
9062	9061	2	E053	Total VA
9064	9063	2	E015	Total Current
9066	9065	2	E004	Line to Line AB Voltage
9068	9067	2	E005	Line to Line BC Voltage
9070	9069	2	E006	Line to Line CA Voltage
9072	9071	2	E00A	Phase A THD
9074	9073	2	E00B	Phase B THD
9076	9075	2	E00C	Phase C THD
9078	9077	2	E01A	Phase A THD Current
9080	9079	2	E01B	Phase B THD Current
9082	9081	2	E01C	Phase C THD Current
9084	9083	2	E023	Power factor Phase A
9086	9085	2	E024	Power factor Phase B
9088	9087	2	E025	Power factor Phase C

Using Modbus Test Software

The meter is now configured to communicate with a Modbus master. For testing, use ModScan32 software running on a PC. Once the correct COM port is selected in ModScan32, the meter will respond to the master node's request and return the register values.

Figure 3 below shows a read holding register example. Here, the meter's Modbus address is 29, the read address is 9002 and 44 registers (32-bit each) are being read. (Keeping in mind that meter registers are 32-bit wide whereas the Modbus registers are 16-bit wide, the length specified is therefore 88).
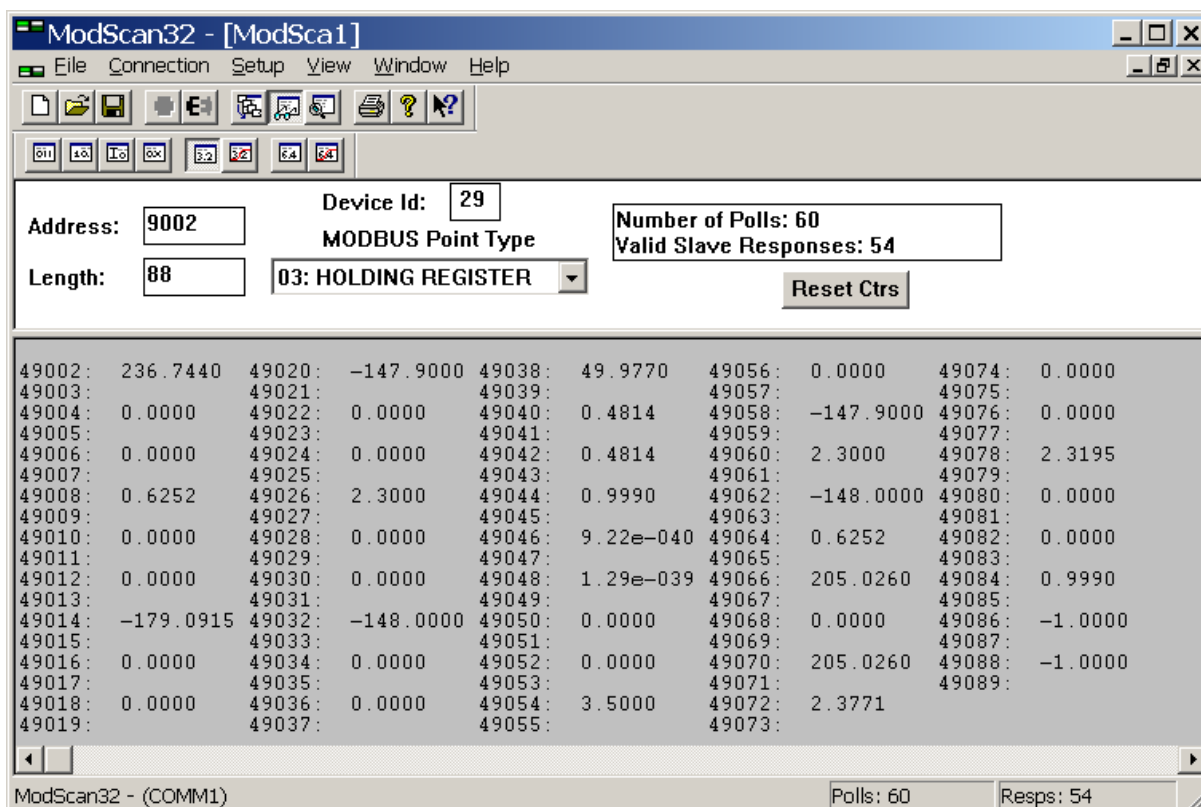
Figure 3: ModScan32 Software

Appendix: Firmware version 1.63

Meter Type		Editions
Mk7A	0x0B826D10	Alternate conventions, PF Log and LS, Modbus, Everything, Enhanced Processor Edition
Mk7C	0x0B826D30	Alternate conventions, PF Log and LS, Modbus, Everything, Enhanced Processor Edition
Mk10A	0x0B864970	Modbus, Alternate conventions, PF Log and LS, Everything, Disconnect via IO, Billing Reset Button, Enhanced Processor Edition
Mk10A	0x0B866970	Modbus, Alternate conventions, PF Log and LS, Everything, Disconnect via IO, Connect Button, Enhanced Processor Edition
Mk10Dv2	0x0B824D42	Modbus, Alternate conventions, PF Log and LS, Everything, Billing Reset Button, Enhanced Processor Edition
Mk10Dv2	0x0B826D42	Modbus, Alternate conventions, PF Log and LS, Everything, Connect Button, Enhanced Processor Edition

Meter Type	Editions	
Mk10E	0x0B864960	Modbus, Alternate conventions, PF Log and LS, Everything, Disconnect via IO, Billing Reset Button, Enhanced Processor Edition
Mk10E	0x0B866960	Modbus, Alternate conventions, PF Log and LS, Everything, Disconnect via IO, Connect Button, Enhanced Processor Edition
Mk10H (DIN Rail)	0x0B8649D0	Modbus, Alternate conventions, PF Log and LS, Everything, Disconnect via IO, Billing Reset Button, Enhanced Processor Edition
Mk10H (DIN Rail)	0x0B8669D0	Modbus, Alternate conventions, PF Log and LS, Everything, Disconnect via IO, Connect Button, Enhanced Processor Edition

References

1. –

Revision History

Revision	Date	Changes	Modified by
1.0	10 Nov 2017	Modbus for Atlas1 Meters – First Release	Hoo Chiong Kee (EDMI SG)

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