

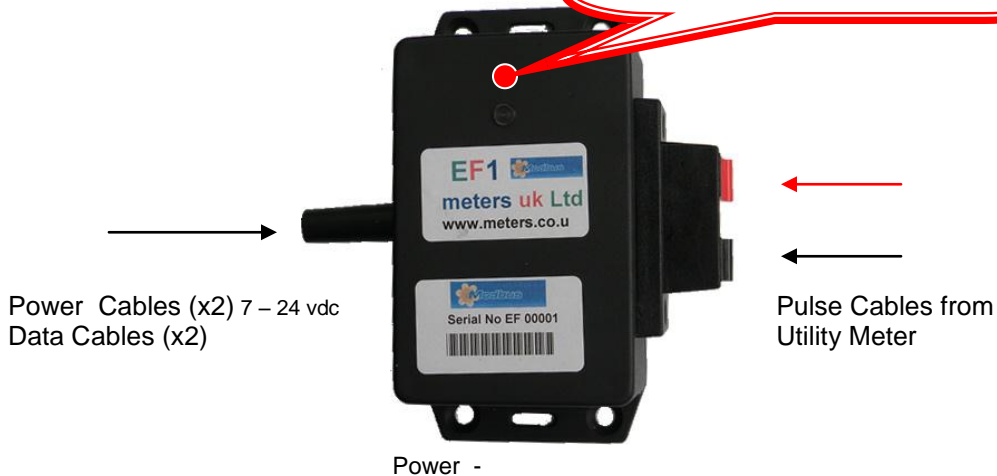
EF1

Converts Utility Meter Pulsed Outputs
Into Modbus Protocol



Manufactured To
ISO EN 15745 – 2:2007

LED Flashes each time a pulse is
received from the Utility Meter
And a shorter test pulse if the
address is changed



Data Format :-
Modbus RTU
9600 Baud
1 Start bit
8 Data bits
1 Even Parity bit
1 Stop bit

To read the registers use Function Code 4 (Read Input Registers) –
Register 1 & 2 contain the 32 bit pulse count value
Function Code 17 returns the interface serial number
Request – Address, 17, CRC low, CRC high
Response – Address, 17, 4, SN 1, SN 2, SN 3, SN 4, CRC low, CRC high

Function Code 70 sets the interface address
Request – Address, 70, New Address, CRC low, CRC high
If Address is 0 then the New Address is set but no response is sent, otherwise -
Response – Address, 70, New Address, CRC low, CRC high

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Modbus Cable Specification

Modbus over RS485 cable should have the following characteristics –

- 1 twisted pair of conductors for data
- 1 additional conductor for common
- An overall protective screen

The twisted pair of conductors for data should have a characteristic impedance of 120 Ohms and a capacitance of less than 80pF per metre. All the conductors should be of at least 0.2mm² (24 AWG) cross section and preferably of stranded construction for greater durability.

The total length of all cable within a network is limited to 1km with this type of cable.

If using EF1 interfaces an additional conductor is required to provide power. This can be achieved using 2 twisted pairs with one pair for data and the other pair for common and power. This type of cable can also be used where power is not required in which case the additional conductor is not connected.



The common conductor should be connected to the GND terminal on all the Modbus interfaces to provide a reference for data reception.

The outer screen should not be connected to any of the interfaces, but should maintain continuity and be earthed near the master interface.

- Suitable cables are –
- Belden 9842
 - Belden 3106A (not for EF1)
 - Belden 3107A

A cheaper alternative for smaller networks (up to 500m total cable length) is to use Cat5 Ethernet cable with similar characteristics.

Fault Finding – FAQ's

Q1 – I need to reset the address – from the one set in the EF1

A1 – The address can be reset by sending the following commands

Code 0 – Then 70 (actual command) then address you wish to use

Q2 – How do I know the address has changed?

A2 – The LED flashes to confirm change

Q3 – I have no software to reset this address ?

A3 – Free software is available at www.windmill.co.uk

Q4 - Does the unit need a power supply ?

A4- Yes it will not work without it

Q4 – What power supply is required ?

A4 - 12vdc or 24vdc (must be dc supply)

Q5 – What is the best type of cable to use ?

A5 – Screened Cable Definitely – suggest

2 pairs of screened twisted pairs

or

Screen Cat 5 – (which has 4 twisted pairs – use 2) Suitable for up to 600 metres

Q6 – Can I test for the pulse manually?

A6 – Yes if the unit has power – short out the pulse input terminals (make a temporary contact between them) and the LED will flash. The LED flashes for 100msecs on receipt of a pulse (10msecs when the address is changed)

Q7 - How do I match the registers on the EF1 to mirror the meter display ?

A7 – Use the Function Code 16

Q8 – What Register/Map/Table is used

A8 – Unsigned 32bit bit integer High Byte – High Word First

Request		
Function Code	1Byte	0 x 10
Starting address	2 Bytes	0x0000 to 0xFFFF
Quantity of Registers	2 Bytes	0x0001 to 0x007B
Byte Count	1 Byte	2 x N
Register Value	N x 2 Bytes	Value
Response		
Function Code	1 Byte	0 x 10
Starting Address	2 Bytes	0 x 0000 to 0x FFFF
Quantity Of Registers	2 Bytes	1 to 123 (0x7B)
Error		
Error Code	1 Byte	0 x90
Exception Code	1 Byte	01 or 02 Or 03 Or 04