Rayleigh Instruments
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EA40

Pulse counter with Modbus RTU protocol communication

- RS485 Modbus RTU interface
- Compact design single module DIN Rail mounting
- Low power consumption
- Pulse count for water, gas or electricity meters

Product Description

Our EA40 is a Pulse acquisition module that counts electrical pulses from devices such as flow meters, old style electric meters, or any other type of equipment that outputs a pulse to represent a quantity of measurement.

The EA40 acquisition module counts pulses over a period of time and then transmits the readings over Modbus protocol to a smart management system such as our **rayleighconnect**™ cloud based remote monitoring and control platform.

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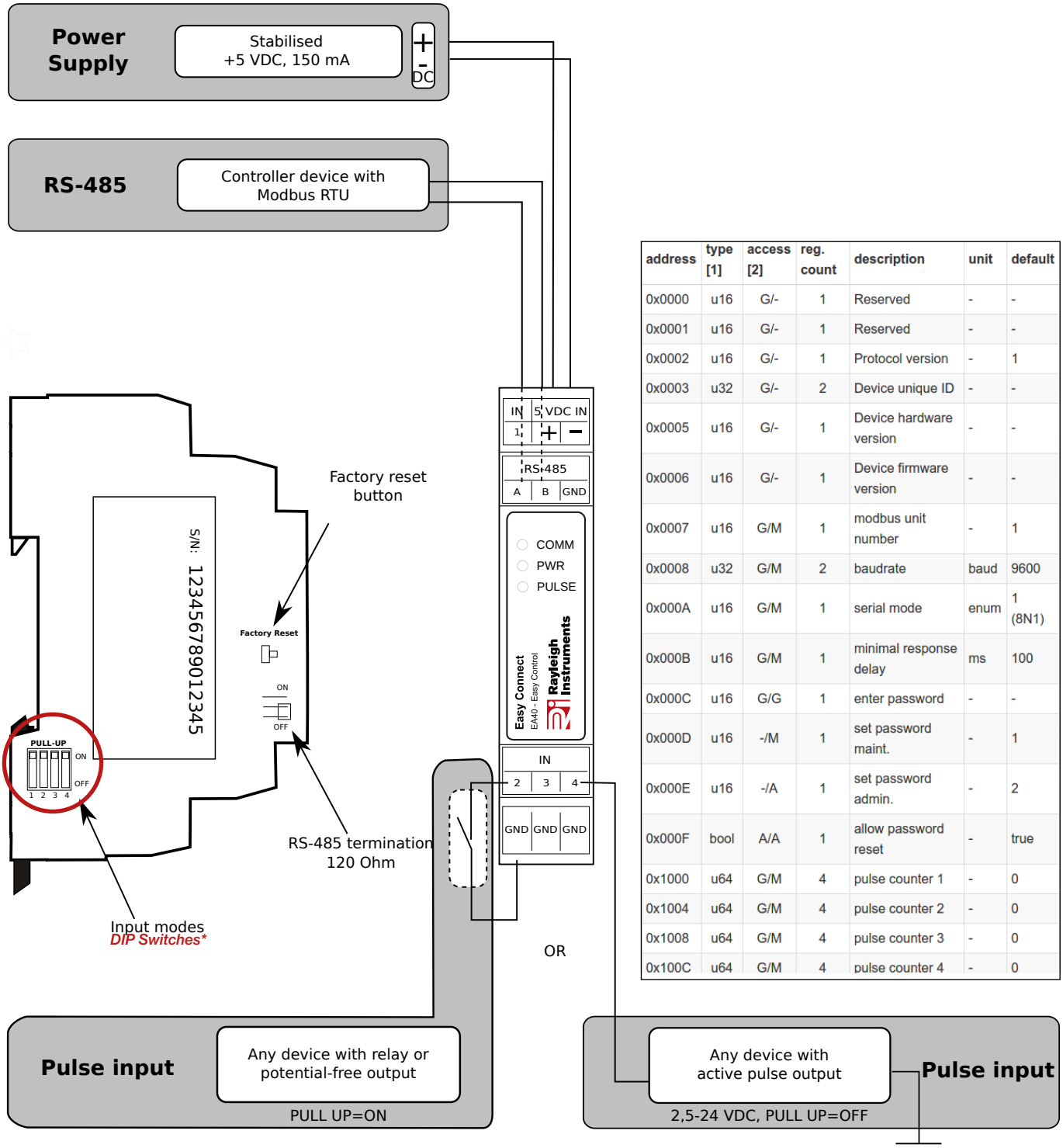
Example Connection Diagram



address	type [1]	access [2]	reg. count	description	unit	default
0x0000	u16	G/-	1	Reserved	-	-
0x0001	u16	G/-	1	Reserved	-	-
0x0002	u16	G/-	1	Protocol version	-	1
0x0003	u32	G/-	2	Device unique ID	-	-
0x0005	u16	G/-	1	Device hardware version	-	-
0x0006	u16	G/-	1	Device firmware version	-	-
0x0007	u16	G/M	1	modbus unit number	-	1
0x0008	u32	G/M	2	baudrate	baud	9600
0x000A	u16	G/M	1	serial mode	enum	1 (8N1)
0x000B	u16	G/M	1	minimal response delay	ms	100
0x000C	u16	G/G	1	enter password	-	-
0x000D	u16	-/M	1	set password maint.	-	1
0x000E	u16	-/A	1	set password admin.	-	2
0x000F	bool	A/A	1	allow password reset	-	true
0x1000	u64	G/M	4	pulse counter 1	-	0
0x1004	u64	G/M	4	pulse counter 2	-	0
0x1008	u64	G/M	4	pulse counter 3	-	0
0x100C	u64	G/M	4	pulse counter 4	-	0

Setting the Dip-switches

	PULL UP (Internal DIP Switches)			
Input Mode	Input 1	Input 2	Input 3	Input 4
Relay/Potential Free	ON ↑	ON ↑	ON ↑	ON ↑
Active 2.5...24Vdc	OFF ↓	OFF ↓	OFF ↓	OFF ↓

Ensure internal Input Mode DIP Switches are set correctly for Active vs Relay type Pulse input.

*** Damage to the device may occur if these are incorrectly set.**

Pulse Timing

Pulse ON duration (t_ON)	Must be >30ms
Pulse repetition interval (time between pulses, t_OFF)	>30ms
Rise/fall transition time (t_T)	Must be <5ms, including transients like contact bounce

Note: EA40 expects pulses in accordance with IEC 62053-31

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Specifications

General Specifications	
Power supply	5VDC, min. 150mA Note: This device requires and external power supply (not included) we recommend the Rayleigh Instruments RPS15-05-CE or equivalent.
Case mounting	35mm DIN rail mounted
Case material	Self-extinguishing PPO, grey (PA-UL 94 V0)
Dimensions (W x H x D)	25 x 90 x 58mm (1 DIN module)
Pulse inputs	4
Communication	RS-485 bus
Connectors	Terminal block 5mm pitch, Max. wire 2.5m^2 (24-12AWG)
Operating temperature	–40°C...+85°C
RS485	
Protocol	Modbus RTU
Supported baud rates	9600bps...115200bps
Max. load	up to 64 device on the bus
ESD protection	±15 kV (HBM) ±8 kV (IEC-1000-4-2 contact discharge)
Pulse	
Isolation	Non-isolated
ESD protection	±15 kV (HBM)
Operating modes	Two modes of operation, selected independently for each input using the built-in switch, enabling counting pulses from:- • Relays or potential-free outputs • Active outputs
Voltage ranges	0...1VDC - 0 2.5...24VDC - 1
Pulses per second	16
Pulse profile	Width : 30ms Cooldown : 30ms Transition : 5ms

Model Selection Table

Description	Model
Pulse acquisition module to RS485 output	EA40
External power supply	RPS15-05-CE

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