

Pliant: readily yielding to influence



- **SDI-12** protocol, or
- **MODBus RTU** protocol, or
- Integral **modem** in conjunction with a Remote Terminal Unit
- Level-controlled Relay Output
- Optional **4-20mA** output
- Optional **digital display** interface

PSE: Pliant Incremental Shaft Encoders

The ///AMASSER PSE Pliant Incremental Shaft Encoders are intelligent sensors using reliable microprocessor-based, optical-sensing technology which may be used with a pulley, tape, and float arrangement to measure stream stage or other fluid levels. They provide data through a communications port (**SDI-12, MODBus RTU, ...**) in engineering units using the programmable "OFFSET" and "SCALE" (units per revolution) settings.

Accumulating position data adaptively up to one thousand times per second drastically reduces the power consumption of the PSE. The resolution of the sensor is 1/400th of a revolution (standard), which when used with a stream-stage pulley of 375mm circumference, results in a resolution of 0.94 mm.

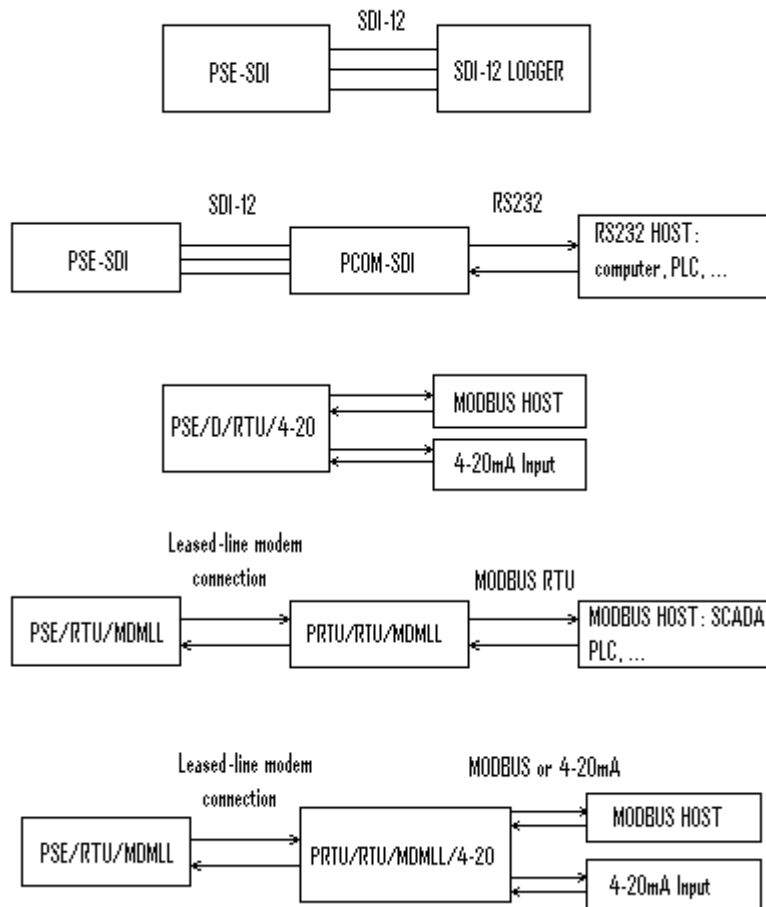
Inquire about our pulleys and punched tapes.

- Several interface options:
 - **SDI-12** interface (version 1.3): the "PSE-SDI"
 - **MODBus RTU** protocol: the "PSE/RTU"
 - Modem-based communications with a Remote Terminal Unit with Display (**PRTU**) using
 - **Leased-line modems:** the "PSE/RTU/MDMLL"
 - **Dial-up modems:** the "PSE/RTU/MDM"
 - **4-20mA** output: the "PSE/D/RTU/4-20"
- EEPROM for non-volatile storage of set-up parameters
- Resolution of 1/400th of a revolution
- Internal battery insures absolute tracking in the event of power interruption
- Instantaneous as well as average, minimum and maximum (SDI-12 only) water level readings
- Low power consumption of about 5 mA quiescent
- Operates on 12VDC
- Non-conductive shaft hub for lightning protection



- Optional LED Display and operator switches (“/D” option)

A few PSE configurations:



Additional options

The PSE is also available with the following options:

- **“/D” option:** 8-digit display with switches that provide an additional interface to the SDI-12 or MODBUS RTU communications. Note that “/4-20” option must be ordered in conjunction with the “/D” option.
- **“/Ev” option:** Provides one user-configurable event counter (Switch Closure vs Pulse and Rollover vs Reset)
- **“/R” option:** Substitutes the 9V alkaline battery backup with a rechargeable version along with a trickle charge which provides practically unlimited life of the battery.

The optional digital display enables the user to display and set up parameters without the need for a host device. These set-up parameters are as follows: the offset and scale of the encoder as well as the node address for SDI-12 communications. Note that the display also allows the user to enter the password that is required to access the setup parameters. When not setting these parameters the display provides the instantaneous position of the encoder, i.e. the water level.

Specifications

Processor: Atmel 89S8252 @ 3.6864 MHz.
Word Size : 8 bit data - 8 bit instruction
Memory : 89S8252, 256 bytes RAM
EEPROM 2 kbytes

Shaft Encoder

C-Model, Agilent
Sensor type - two channel optical incremental encoder
Resolution: 400 counts per revolution
Software conversion to engineering units provided in firmware. (settable "SCALE")

Range

+/- 30.72 m with .375 m circ. Pulley (sold separately)
+/- 81.9 ft with 1.00 ft circ. Pulley (not avail.)

Host Interface

PSE-SDI: SDI-12, version 1.3
PSE/RTU: MODBUS RTU
/MDMLL & /MDM: Built-in modem. Requires Remote Terminal Unit with Display (**PRTU**)
/4-20 option: 4-20mA output

PRTU

Polls the PSE at fixed rate (1/sec for /MDMLL) and loads MODBUS registers with realtime data
Provides data to host via MODBUS RTU.
4-20mA output available (option "/4-20"). Refer to PRTU datasheet.

Max. Response Speed

2.5 rev/sec.

Output

ASCII accumulated level

Physical Characteristics

Height : 152.0 mm. (6.0 in.)
Width : 114.0 mm. (4.5 in.)
Depth : 70.0 mm. (2.75 in.)
Weight : 1.35 Kg (3.0 lb.)
Mounting brackets: Use four #10 bolts or screws.

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Connectors

9 pin and 8 pin AMP CPC Connectors
Current Carrying Capability - 1.5 Amp rating
Dielectric Withstanding Voltage >1500V

Power Supply

+10.5 to 15 V input for external battery, charger or power supply

Power Consumption

< 5mA quiescent current at shaft encoder with sample rate of 600Hz.
maximum current : < 30 mA

Battery Backup

9 V 565 mAHr alkaline battery backup
(Only if 9 pin connector is mounted)
"/R" option: Rechargeable 9V with trickle charge

Event Counter Input (with /Ev only)

5 kHz max. (Pulse mode)
100 Hz max. (Switch Closure mode)

Mechanical Interface

Threaded shaft

1/4 x 32 thread
#303 stainless

Mounting hub

Made of non-conductive Delrin
Three 6-32 holes for PPULLEY

Maximum safe load

4.5 kg (10 lb)

Starting Torque

47 cm-g (0.65 inch-oz) max.

Environmental Characteristics

Operating : -40 to +55 C
Storage : -60 to +65C
Humidity : <= 100% non-condensing

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