



Custody Transfer in the oil and gas industry refers to the transactions involving transporting physical substance from one operator to another. This includes the transferring of raw and refined petroleum between tanks and tankers; tankers and ships and other transactions. Custody transfer in fluid measurement is defined as a metering point (location) where the fluid is being measured for sale from one party to another. During custody transfer, accuracy is of great importance to both the company delivering the material and the eventual recipient, when transferring a material.

Sciencetech 2479 Custody Transfer Measurement WorkBench contains a data acquisition system, temperature transmitter, RTD, pressure transmitter, turbine flow sensor, ultrasonic flow sensor with display, control valve, pressure gauge, sump tank, pump, and a solenoid valve. It has safety measures such as emergency shutdown and overheat protector. A wide range of experiments can be performed on the platform.

Features

- 7" Human Machine Interface (HMI).
- Different types of controller, DAQ and HMI.
- Real-time DAQ with 8 digital inputs, 8 digital outputs, and 8 analog inputs.
- Dashboard software for supervisory control of the process.
- Flow sensors like turbine flow sensor, ultrasonic flow sensor, and rotameter.
- RTD and its temperature transmitter and pressure gauge and pressure transmitter.
- PC based data logging and analysis.
- On control panel switches like start, stop, pump and solenoid and indicator like visual, audio, pump, and solenoid valve.
- On control panel temperature display, current display (4-20mA), and DC current source (0-20mA).
- Heavy duty workbench with electric control panel.
- User friendly, and self explanatory system.
- Tower light for process indication.
- Sump tank for water storage.
- System frame with wheel arrangement for ease in movement.
- Enhanced electrical safety consideration.

Scope of Learning

- Process control & monitor by HMI.
- Creating application/screen in HMI.
- Downloading and uploading programs in HMI.
- HMI communication with DAQ.
- Creating alarm message in HMI.
- Creating trend in HMI.
- Temperature measurement using temperature display and RTD.

Study and use of

- DAQ digital inputs, outputs, and analog inputs.
- Workbench operation in data analysis using software

Characteristics of:

- RTD, Pressure transmitter, turbine flow sensor, ultrasonic flow sensor, control valve, and temperature transmitter.

Mechanical Specifications

Workbench is ergonomically designed and suitable for a batch of 3 students.

- **Frame:** Cold rolled seamless 18G rectangle tube sections; Rust preventive coat and Powder coating.
- MCB for On/Off control and over load protection.
- Modular design for instruments removal and maintenance.
- Necessary cables & accessories to perform custody transfer measurement workbench experiments.
- Power indicator, On/Off control, circuit breaker of rating 6Amp with On/Off control and with over load protection.

Technical Specifications

Data acquisition system (DAQ)

Analog input	: 8
Digital input	: 8
Digital output	: 8
ADC resolution (in bit)	: 24
Ethernet	: Yes
Data login (PC based)	: Yes
RS485 interface	: Yes

Turbine flow sensor

Supply	: 5V DC
Flow range	: 0-2000LPH
Output	: 0-2.2V DC

DC source

Supply	: 24V DC
Current source range	: 0-20mA DC

Pressure transmitter

Supply	: 24V DC
Pressure range	: 0-15psi
Output	: 4-20mA

Ultrasonic flow sensor with meter

Supply	: 24V DC
Flow range	: 0-2000LPH
Output	: 4-20mA
Type	: Clamp on

Temperature display

Display	: 4 digit, 7 segment
Keys	: 3 nos. for parameter setting

Input type	: RTD
Input range	: -150-850°C

Current display

Display	: 4 digit, 7 segment
Keys	: 3 nos. for parameter setting

Input type	: Current
Input range	: 4-20mA

RTD sensor

Type	: RTD (PT100)
Wire	: 3 wire
Rod length	: 6"
Temperature range	: (-99 -850°C)

Temperature transmitter

Supply	: 24V DC
Temperature range	: 0-200°C
Output	: 4-20mA

Control valve

Input signal	: 4-20 mA
Supply pressure	: 0-30 psi
Line size	: 1"
Type	: Equal percentage

HMI (Human Machine Interface)

Supply	: +24V DC
CPU	: 32-bits 400MHz RISC
Storage	: 128M Flash + 64M DDRAM
Display size	: 7 inch
Resolution	: 800×480 TFT LCD 65,536 colors
Interface	: RS485
Touch screen	: High precision four-wire resistive

Pump

Line size	: 1"
Discharge	: 2400LPH
Power	: 0.5 HP

Solenoid valve

Line size	: 1"
Operating pressure:	0-150psi

Sump tank

Tank capacity	: 200 liter
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Manual valve

Line size	: 1"
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MCB

Supply	: 230V AC
Current	: 16Ampere

Caster wheel	: 4 nos. (2 (with lock), 2 (without lock))
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Size	: 4"
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Energy meter

Voltage range	: 0-440V AC
Current range	: 0-5 Ampere
Watt range	: 1000W

Pressure gauge

Pressure range	: 0-60psi
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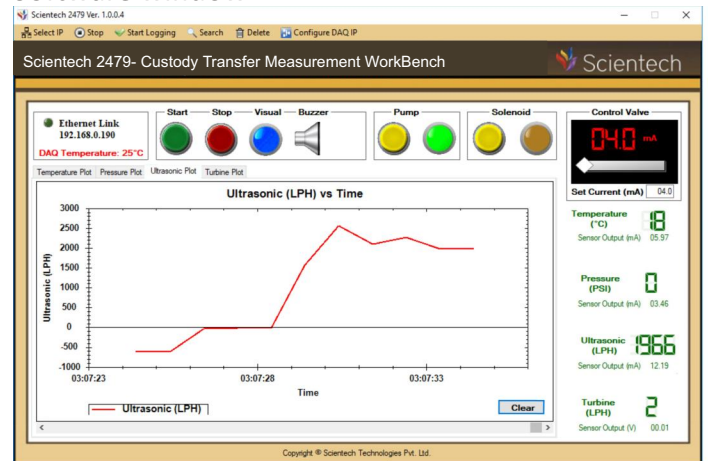
Air compressor

Voltage	: 220V AC
Power	: 0.75HP
Pressure range	: 0-110psi
Tank and capacity	: 24 liter

Package contains (in nos.)

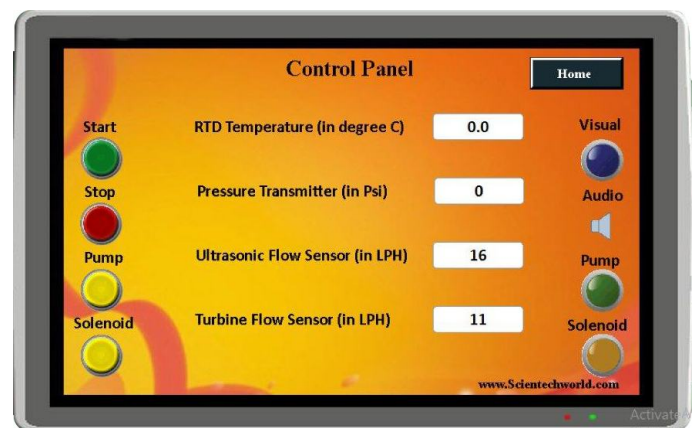
Ethernet cable	: 1
Air compressor	: 1
PU tube	: 1 meter
4mm yellow patch cord 16"	: 8
4mm blue patch cord 16"	: 8
4mm red patch cord 16"	: 6
4mm black patch cord 16"	: 6
4mm red patch cord 40"	: 5
4mm black patch cord 40"	: 4
4mm yellow patch cord 40"	: 5
Tower light	: 1

Software window



Graph of ultrasonic flow sensor

HMI software window



HMI control panel