Tank Inventory
Management Systems

# Communication Interface Unit 133-550

## FEATURES

Real-time, on-line, indication of level in mm and temperature in °C (with tank number) for up to 64 tanks

Input from SBEM Smart Tank Data Transmitter, Servo Gauge & Radar Guage

Alternative indication of alarm and diagnostic data

Alternative indication of interface level and density (in case of Servo Gauge)

Keyboard for operator interface and programming of alarms, date/time and autoprinting intervals

Additional keys for full operator access to Servo Gauge functions, including calibration

Interface with IBM compatible PC-AT and standard dot matrix printer on RS 232C serial interface to form a complete Tank Inventory Management System

In-built user programmable alarm annunciator for 4 level and 1 temperature alarm per tank

Leak alarm with programmable rate

Optional, programmable, open collector alarm outputs, relay contact outputs and current outputs for control action

Microprocessor based circuit with in-built diagnostics

## INTRODUCTION

The Communication Interface Unit (CIU) is an intelligent microprocessor based control room instrument and uses the most sophisticated digital technology presently available for interfacing field transmitters* to IBM compatible PC-AT in the control room loaded with SBem Tank Inventory Management Software (SBTIS), to form a complete Tank Inventory Management System.
ASCII coded tank parameter data* from 16 field transmitters (expandable upto 64) is decoded by the CIU and displayed / transmitted to a computer and/or printer.
It also functions as a stand alone unit for real time monitoring of tank level, temperature, interface level and density.
Level, temperature and alarm data with date & time can be directly printed on a standard dot matrix printer (with serial interface card).
In-built audio visual alarm annunciator provides annunciation of 4 level and 1 temperature alarm per tank.

In-built keyboard provides operator interface for all functions of Servo Gauge and for programming of alarms, date / time and auto printing intervals.

*

| FIELD TRANSMITTERS | TANK PARAMETER DATA TRANSMITTED |
|---|---|
| Smart Tank Data Transmitter | Level & temperature |
| Servo Gauge | Level, temperature, interface level & density |
| LPG Servo Gauge | Level, temperature, interface level, density, vapour pressure, vapour temperature, liquid volume, liquid quivalent of vapour volume, mass of liquid & vapour and total mass |

## CONSTRUCTION

Housed in a 19" full rack (card frame) it consists of following cards

1. CPU + Serial output card (with RTC & NOV RAM)
2. RS 485 card
3. Power supply unit
4. Mother bus
5. Keyboard and display interface card

Additional slots are available for alarm / current output cards. These circuits are modular to ease installation, maintenance & upgradation.

## OPERATION

ASCII coded tank data from instruments is decoded and displayed on in-built display.
Level, temperature, interface level, density, alarm status & diagnostics are transmitted to computer on RS 232C port in ASCII for monitoring, logging & report generation.

Keyboard facilitates the operator to select a particular tank for display & full function control of Servo Gauges including calibration from the control room.

Alarm, date / time & auto printing intervals are easily programmed by operator on the keyboard the display prompts the operator to input information.

## VARIANTS

**A. LPG Communication Interface Unit (LPG CIU)**
To enable display of pressurised liquid inventory parameters from LPG Servo Gauge & printing on printer.

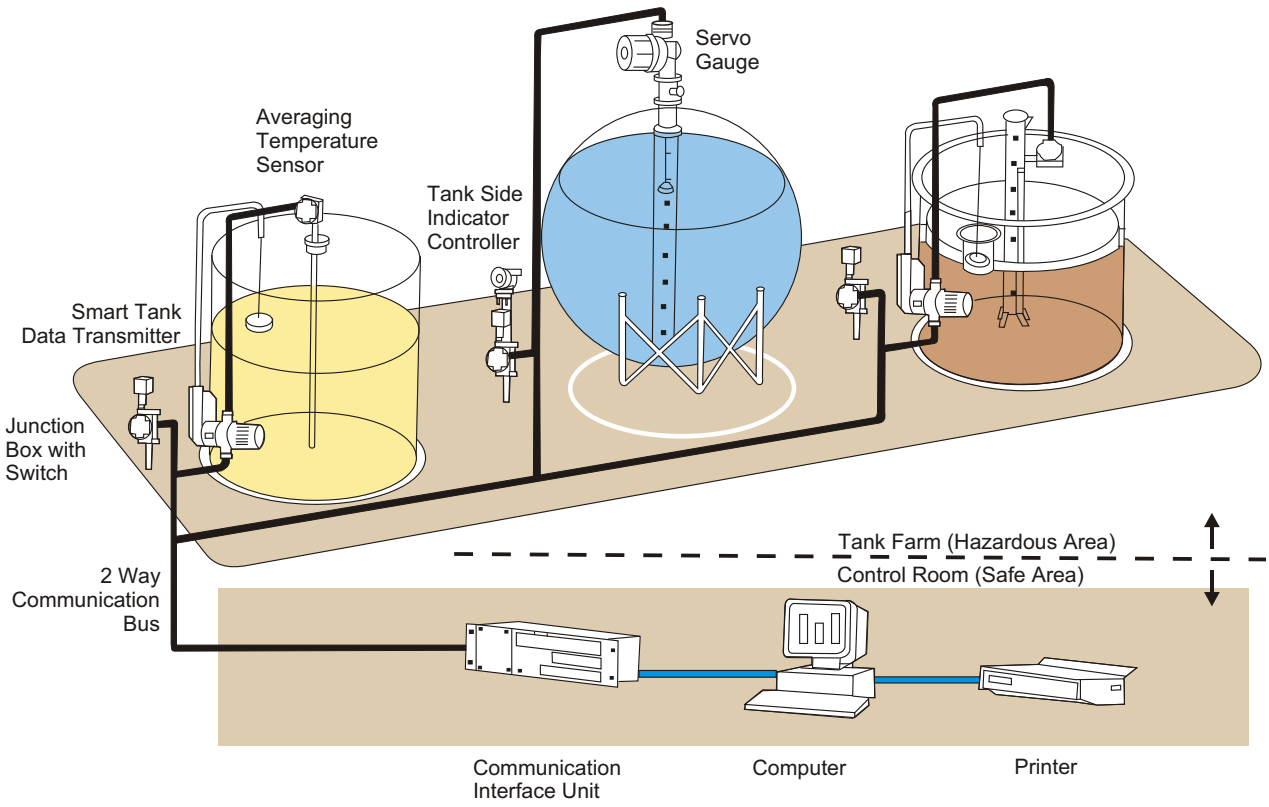
**B. Single Tank Indicator (STI)**
Tank/Transmitter dedicated interface unit in 19" half rack.

**C. Repeater Display Unit (RDU)**
To enable display of tank data at other location/ locations. One or more units for each bus, acting as one more field transmitter.

## ACCESSORIES

1. **Isolation and Termination Unit (ITU)**- standard
   Back of panel mounting. Provides isolated power supply to Smart Tank Data Transmitters and/or Servo Gauges in the field. Enables termination of power and signal cables from field transmitters. Has a D9 connector plug which connects to RS 485 card of CIU.
   One unit is required for every 16 Smart Tank Data Transmitters or 8 Servo Gauges.
2. **CIU to computer connector (15M long)** - standard
3. **CIU to printer connector (15M long)** - standard
   (This connection requires a serial interface card in the printer.)
4. **Relay Panel Assembly (RPA)** - optional
   Provides potential free relay changeover contacts rated 6A @ 230VAC/28VDC (Resistive) - 12 relays per panel. Maximum 4 RPAs - 48 relays for each CIU / RDU.
5. **Current Output Panel (COP)** - optional
   Provides isolated 4-20 mA DC current outputs (load 750 maximum), 8 outputs per panel. Maximum 2 COPs - 16 outputs per CIU / RDU.
6. **MODBUS Adapter Unit (MAU)** - optional
   For interfacing to supervisory systems e.g. DCS, LRC, SCADA, PLC, etc. Converts SBEM proprietary protocol in to MODBUS RTU protocol.
7. **Radar Gauge Adapter (RGA)** - optional
   For converting signal from Radar Gauges of other makes and interfacing them with SBEM CIU and TIMS.

## TYPICAL TANK INVENTORY MANAGEMENT SYSTEM



# SPECIFICATIONS

## CIRCUITRY

Microprocessor based

| | | |
|---|---|---|
| CPU | : | Z-80, 4 MHz |
| RAM | : | 8K Battery backed |
| RTC | : | In-built |

## LEVEL AND TEMPERATURE INDICATION

| | | |
|---|---|---|
| Input / output / command | : | ASCII coded signal from/to SBEM Smart Tank Data Transmitter, Servo Gauge and from Radar Gauge on a 2 way / 2 wire RS 485 bus |
| Display | : | 11 digit, 1/2" high 7 segement LED to simultaneously display<br>- CIU connection no. (2 digit)<br>- Level in mm (5 digit)<br>- Temperature in $^{0}$C (4 digit)<br>Alternative indication of interface level and density (in case of Servo Gauge) |
| Data update | : | Less than 2 seconds |

## COMMUNICATION

| | | |
|---|---|---|
| With STDT & / or Servo Gauge | : | On RS 485 port<br>Baud rate 1200 (standard)<br>2400 (optional) |
| With computer* | : | On RS 232C port<br>Baud rate 2400 (standard)<br>4800 (optional) |

* IBM compatible PC-AT minimum

| | | |
|---|---|---|
| With printer* | : | On RS 232C port<br>Baud rate 1200 (fixed) |

* Dot matrix printer with serial interface card

## PROGRAMMING AND OPERATOR INTERFACE

In-built keyboard with 13 keys for operator interface - to select tank no. for tank data display and programme alarms, date / time, auto printing time interval.
7 additional keys provide operator full access to the Servo Gauge functions.

## ALARM ANNUNCIATION (IN-BUILT)

| | | |
|---|---|---|
| Level alarms | : | Programmable 4 alarms per tank - LL, L, H and HH |
| Temperature alarm | : | Programmable 1 alarm per tank - TH |
| Leak alarm | : | Programmable rate |

Alarm annunciated on display - display flashes showing tank no. and alarm type. On acknowledging alarm through keyboard, display returns to normal tank data display. Alarm values are stored in non-volatile RAM.

## ALARM OUTPUT (OPTIONAL)

Programmable open collector outputs for alarms in multiples of 12, maximum 48.
Each output can sink 50 mA (maximum) at 24 VDC.

## CURRENT OUTPUT (OPTIONAL)

Maximum 16 outputs - 4-20 mA DC, isolated, proportional to level or temperature (upscale / downscale on error) - programmable

| | |
|---|---|
| Maximum load | : 750 |
| Level span | : 3640 mm (minimum) |
| Temperature span | : 10$^{0}$C (minimum) |

## POWER SUPPLY

110/230 VAC, ±10%, 50 Hz, 1 , 67 VA

## CABLING

From STDT & / or Servo Gauges in field to ITU in control room.
Up to 16 transmitters can be looped on single cable loop.

| | | |
|---|---|---|
| Power (110 VAC) | : | 2 core, 1.5 mm$^{2}$ copper / 2.5 mm$^{2}$ Copper |
| Signal (RS 485) | : | 2 core (1 twisted pair)<br>1 mm$^{2}$ Copper<br>Rmax 200 1 F<br>Cmax 1 F |
| Distance | : | Up to 1200 Mtrs. (More distance possible with Line Drivers) |

## PROTECTION

Opto isolators provide galvanic isolation between input / output terminals and internal circuitry.
Surge protection using Metal Oxide Varistors.

## SELF DIAGNOSTICS

In-built on-line diagnostics checks transmitted signals and displays error messages.
Off-line diagnostics checks internal circuitry.
Surge protection using Metal Oxide Varistors.

## SELF DIAGNOSTICS

In-built on-line diagnostics checks transmitted signals and displays error messages. Off-line diagnostics checks internal circuitry at chip level and displays error messages.

## ENVIRONMENT

| | |
|---|---|
| Ambient operating temperature | : 0 to + 50$^{0}$ C |
| Relative Humidity | : 95% maximum, non-condensing |

## MOUNTING & ENCLOSURE

Table top / flush panel mounting, enclosure 19" full / half rack - IP 30

## ORDERING INFORMATION

| MODEL 133-550 | COMMUNICATION INTERFACE UNIT |
|---|---|

| CODE | TYPE OF TANK FARM INSTRUMENTS |
|---|---|
| 1 | Smart Tank Data Transmitter (STDT) |
| 2 | Smart Tank Data Transmitter and / or Servo Gauge |

| CODE | NO. OF INPUTS |
|---|---|
| 1 | 16 nos. |
| 2 | 32 nos. |
| 3 | 48 nos. |
| 4 | 64 nos. |

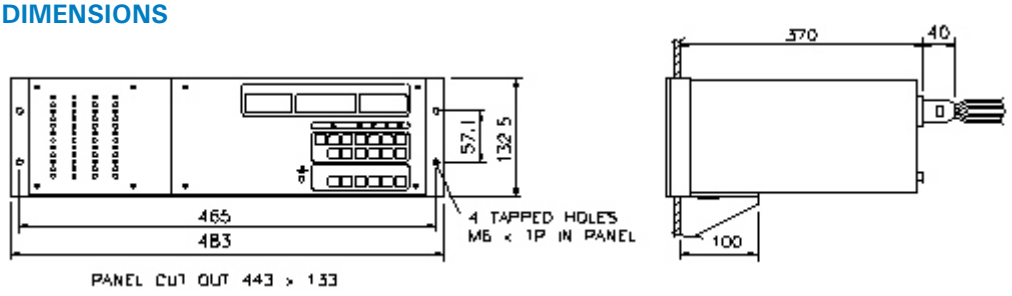
| CODE | NO. OF ALARM OUTPUTS (OPEN COLLECTOR) |
|---|---|
| 0 | No alarm output |
| 1 | 12 nos. |
| 2 | 24 nos. |
| 3 | 36 nos. |
| 4 | 48 nos. |

| CODE | POWER |
|---|---|
| 1 | 110 VAC |
| 2 | 230 VAC |

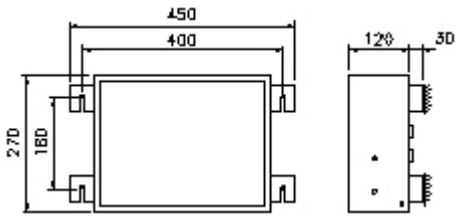
| CODE | NO. OF CURRENT OUTPUTS |
|---|---|
| 0 | No current output |
| 1 | 04 nos. |
| 2 | 08 nos. |
| 3 | 12 nos. |
| 4 | 16 nos. |

| 133-550 | 2 | 1 | 0 | 1 | 1 | TYPICAL MODEL NO. |
|---|---|---|---|---|---|---|

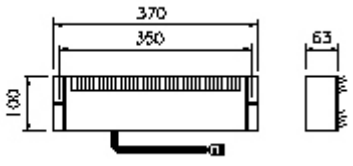
## MECHANICAL DIMENSIONS




**Communication Interface Unit**




**Isolation & Termination Unit**




**Relay Panel Assembly / Current Output Panel**



*** Continuous development may necessitate changes without notice.

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