8130 Remote Terminal Unit

Tank gauge interface for data acquisition and host gateway for tank farm, pipeline or refinery applications

FM APPROVED

CSA

FuelsManager® Compatibility
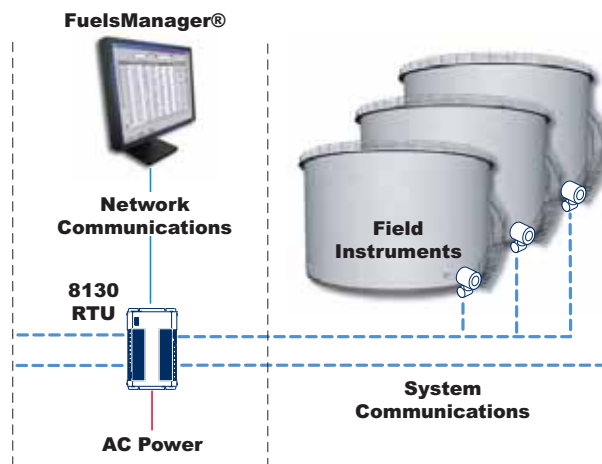
Benefits and Features

- Easily expandable through the use of plug-in interface modules – reduces cost by integrating all analog, digital and serial data inputs and outputs

- Multiple host ports – adapts to your needs and redundancy requirements

- Supports multiple tank gauge protocols – connect your existing equipment at less cost

- Digital and analog I/O connectivity – allows simple tank farm alarm integration

- Fully compatible with FuelsManager – tank inventory management made easy

- 8130 RTU and gauge configuration data can be exported to other applications, such as Microsoft Excel® or Access® – document all tank gauge equipment

- Remote configuration of your tank gauges – means less on-tank activities, resulting in less personnel risk

Applications

The 8130 Remote Terminal Unit (RTU) supports up to four individual expansion interface modules that can interface to virtually any tank gauge on the market.

Each interface module will scan all the connected gauges for measured data, such as level, temperature, density, water level and alarms.

The 8130 RTU also connects to most types of sensors or actuators on your site, and to PLCs and DCS computers. All information obtained can be uploaded to the host system for inventory, alarm and control purposes.

FuelsManager®

Network Communications

8130 RTU

AC Power

Field Instruments

System Communications

Function and System Design

The Remote Terminal Unit (8130 RTU) serves as an effective solution in SCADA or standalone control applications by integrating automatic tank gauge communications. Digital, analog and serial I/O interface boards further enhance the 8130 RTU into an extremely capable and compact solution for control applications.
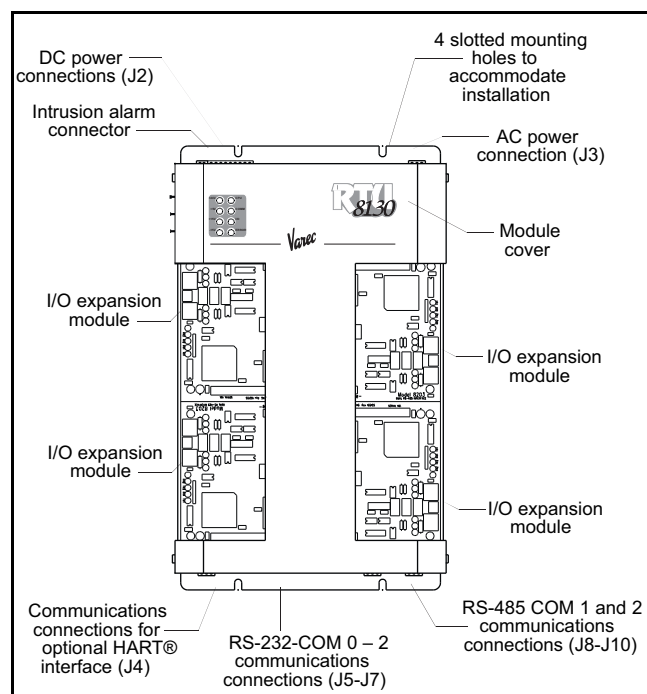
The 8130 Remote Terminal Unit

Intelligent Module Architecture

The 8130 RTU supports up to four interface modules. Each module has its own processor for fast and reliable field data scanning. An internal high speed serial data link communicates the data into a central database. The modules make configuration of the internal 8130 RTU database simple and straightforward. Multiple host communication ports offer windows into all the real-time data for up-linking to one or multiple host computers.

Field I/O Communication

A full range of I/O interfaces is available for the 8130 RTU, offering connectivity to virtually every type of signal encountered in industrial environments. The 8130 RTU uses standard transmitter signal levels to interface with:

- Analog input signals, such as 4-20 mA, 1-5 or 0-10 volts
- Digital I/O with isolated solid state relays for connection to 5/24 Vdc and 120/240 Vac
- High frequency pulse input for totalization
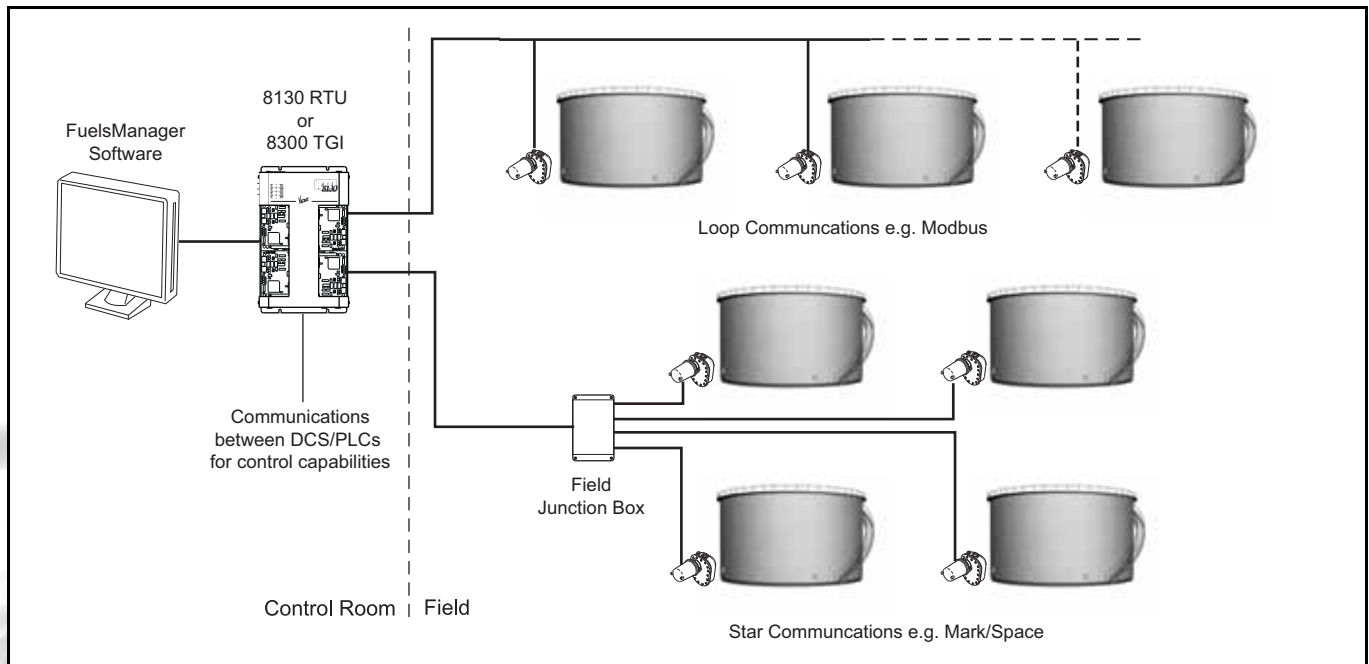- 4-20 mA and 0-10 V analog outputs

Expansion Modules

A range of modules is available for interfacing to nearly any brand of tank gauge equipment or technologies, making it possible to integrate float and tape transmitters, HTG, servo, magnetostrictive and radar gauges. This allows direct gauge communication, making communication protocol converters superfluous and combining all equipment into one tank inventory system. The 8130 RTU can accommodate a maximum of four expansion modules in four slots. The right most column indicates how many slots are used per module type.

Order code	Description	No. of slots used
N8201-	16-Channel Digital I/O Interface Module	2
N8203-	Dual RS-485 Communications Interface Module Option 2 - MODBUS™ Protocol Option 3 - MTS DDA Protocol Option 4 - Petrosense Probe protocol Option 5 - Rackbus Protocol	 1 1 1 1
N8204-	8 Channel Multi-Function Interface Module	1
N8205-	16 Channel Analog Input Interface Module	2
N8207-	8-Channel Analog Output Interface Module	1
N8208-	TIWAY (Texas Instruments IT-111, IT-121, IT-150) Interface Module	1
N8210-	Varec Mark/Space (Varec 1800, 1900, 4000) Interface Module	1
N8211-	Current Loop (GPE) Interface Module	1
N8212-	Saab (TRL/2) Interface Module	1
N8213-	V1 (Sakura Endress TGM 3000, TGM 4000, NMS53x) Interface Module	1
N8214-	Enraf (811, 802/812, 854, 873) Interface Module	1
N8215-	L&J Tankway (MCG 1000, MCG 1500, MCG 2000) Interface Module	1
N8216-	LON (Barton Instruments 3500) Interface Module	1
N8217-	Dual RS-232 Interface Module	1

Host Communication

The 8130 RTU combines with FuelsManager software to provide an extremely cost efficient and reliable tank inventory system. It also provides fully redundant host ports and is compatible with a variety of other host systems through the industry standard MODBUS™ protocol.

Typical 8130 RTU System Diagram

The diagram labels include:
- FuelsManager Software
- 8130 RTU or 8300 TGI
- Loop Communcations e.g. Modbus
- Communications between DCS/PLCs for control capabilities
- Field Junction Box
- Control Room | Field
- Star Communcations e.g. Mark/Space

Installation Guidelines

The following information should be used as a guide only; please refer to the operation and maintenance manual for complete installation instructions.

The 8130 RTU can be installed in a variety of industrial environments of a non-hazardous nature. For operation within hazardous areas (FM or CSA Class I Div. 2), the 8130 RTU must be installed within a NEMA 4 enclosure.

NEMA 4 Enclosure for Class I Div 2 operation	
Order code	Description
140061562	24x20x8 in.
140061213	20x24x8 in. with 48VDC supply
140061564	24x24x6 in. with 24VDC supply and Modem
140061566	24x20x8 in. with Front Panel Display, no Power Supply

Operation

Configuration and Programming

Remote programming can be accomplished from the host or locally using a PC with the Windows-based configuration program ViewRTU. This tool simplifies configuration and diagnostics, allowing uploading of final equipment configurations. Reports can also be generated via a built-in function to assist in documentation.

Software Functionality

8130 RTU software blocks are built-in, providing a broad range of complex, but commonly needed functions, such as:

- Analog scaling - maps 4-20 mA values into a digital format for host applications

- Flow measurement and totalization - simplifies the implementation of flow computations

- Digital alarm handling - offers the possibility of linking alarm inputs to outputs, such as level switch inputs to claxon or siren outputs

- Pump/valve acquisition and control - allows easy implementation of pump/valve status to the host system or remote control for pumps and motor operated valves

Technical Specifications

General

Manufacturer	Varec, Inc. Atlanta, USA
Designation	8130 RTU
Function	Tank gauge interface for data acquisition and host gateway for tank farm applications

System Design

Motherboard	16-bit processor with intelligent expansion modules
Expansion modules	Maximum 4 (depending on type)
Module types	Intelligent field device communication Analog I/O Digital I/O Serial RS-233C or RS-485
Visual indication	8 LEDs on main board indicate power and status

Software Functionality

Tank gauge scanning	Data acquisition of measured values from connected tank gauges and digital and analog I/O
Analog scaling	Scales analog inputs into process units
Flow measurement & totalization	Integration of dynamic flow measurement
Digital alarm I/O	Handling of digital and analog alarm setpoints
Pump & valve control	Remote control of pumps and valves via direct digital I/O or PLC communication
Service & diagnostics	Gauge configuration Gauge diagnostics Read direct data from gauge Upload/download configuration Save/load configuration files

Operating Conditions

Operating temperature	-40 °F to +185 °F (-40 °C to +85 °C)
Humidity	5 to 95% (non-condensing)
Storage temperature	-40 °F to +212 °F (-40 °C to +100 °C)

Host Communication Interfaces

Host comm. ports	3
Comm. type	Com #0 : RS-232C Com #1,#2 : configurable for RS-232C or RS-485
Baudrate	1200 - 19200 baud
Modem support	RTS/CTS
Protocol	MODBUS™ RTU protocol
Mode	RTU mode, master and slave
Media access	Master/Slave

MODBUS™ Functionality

MODBUS™ commands support	1, 2, 3, 4, 5, 6, 15, 16
MODBUS™ mapping	Configurable

Power Supply

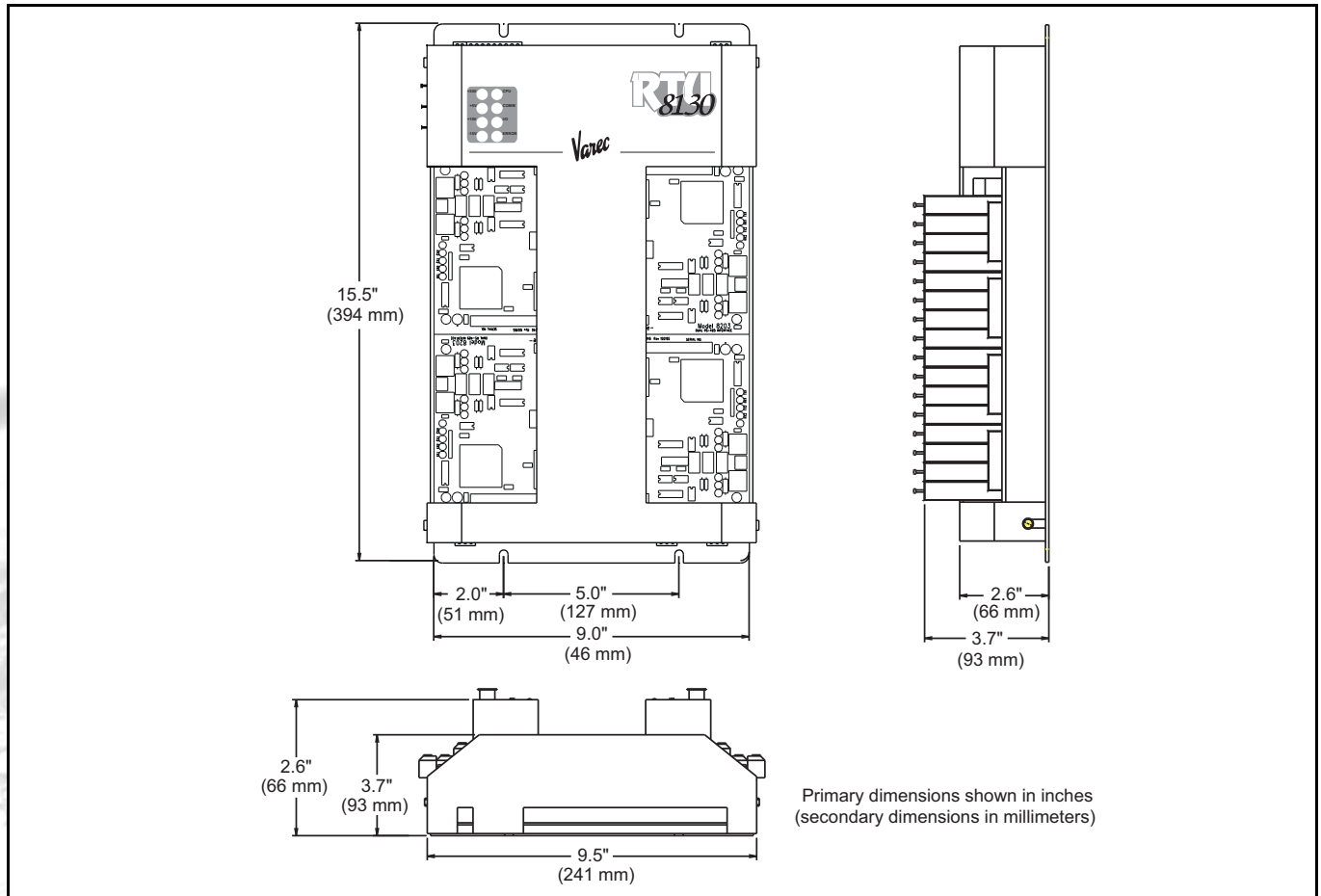| Supply voltage	AC or DC 90 - 130 or 200 - 240 V_{ac}, 50/60 Hz 18-36 V_{dc}
Power consumption	50 VA max @ 110/220 V_{ac} (500 mA) 20 VA max @ 24 V_{dc}
Surge protection	ANSI/IEEE standards Gas Discharge Tubes (GDTs) and clamping diodes on all field inputs, power supply inputs and RS 485 input channels

Mechanical Construction

Enclosure type	NEMA 1 (IP10)
Dimensions (HxDxW)	16" (406 mm) x 9.5" (241 mm) x 2.5" (64 mm)
Material	Powder coated steel
Mounting	Wall
Terminals	Plug-in type with screw connections

Certifications and Approval

CE
FM CI.I Div. 2 Gr. A,B,C,D T3C (3015423) CSA CI.I Div.2 Gr. A,B,C,D (LR 40894)

Product Dimensions

15.5"
(394 mm)

2.0"
(51 mm)

5.0"
(127 mm)

9.0"
(46 mm)

2.6"
(66 mm)

3.7"
(93 mm)

2.6"
(66 mm)

3.7"
(93 mm)

9.5"
(241 mm)

Primary dimensions shown in inches
(secondary dimensions in millimeters)

Options

Order code	Description
280061489	Front Panel Display
450061357	DC Output Module 3-60 VDC Normally Open
450061358	AC Input Module 0-140VAC 8mA
450061368	AC Output Module 24-140VAC Normally Open
450061369	DC Input Module 3-32 VDC 18mA
450061387	AC Input Module 90-140 VAC
450061388	AC Output Module 12-140 VAC Normally Open
450061389	DC Input Module 10-32 VDC
450061390	DC Output Module 5-60 VDC Normally Open
450061621	AC Input Module 240 VAC
450061582	AC Output Module 240 VAC Normally Open
450061491	Analog Input Module 4-20mA (use with 8204 only)
450061574	OPTO 22 #G4ODC5R5 Normally Closed
450061623	High Speed Pulse Input Module 1-5VDC

Order Codes

8130 Remote Terminal Unit

10						Power Supply
	0					Power supply 90 - 130 V_{ac} 50/60 Hz
	1					Power supply 220 - 240 V_{ac} 50/60 Hz
	2					Power supply 18 - 36 V_{dc}

20						Host Emulation
		0				Additional options not used
		2				TSU emulation (Varec Tankview Systems)
		3				CIU emulation (Enraf model 858 CIU interface)

30						Special Field Communications
			0			Additional options not used
			4			Varec Matrix communication (Interfaces to Varec Matrix devices, 1600/1700) and requires 8210, 8201 & 8204 modules)
			5			MODBUS master commuincation (uses RTU motherboard communications ports)
			6			CIU communication (Interfaces to existing Enraf 858 CIU devices)

60						Calculations
				0		Additional options not used
				7		Hybrid tank calculations
				8		Hydrostatic tank calculations

70						Strapping Tables
					0	Additional options not used
					9	Embedded tank strapping tables

80						Approvals
					0	For use in non-hazardous areas
					1	FM Cl.I Div. 2 Gr. A,B,C,D T3C (3015423) Optional enclosure required.
					2	CSA Cl.I Div.2 Gr. A,B,C,D (LR 40894) Optional enclosure required.

N8130-						Complete product designation

Your Official Representative