

DataFlow RTU Radio Telemetry Systems



\$1546
Basic Unit



DataFlow radio telemetry transceiver shown with antenna

The DataFlow RTU is a complete wireless telemetry system designed to deliver industrial instrumentation signals from a source to other instruments via radio frequency communications. The DataFlow RTU allows you to access industrial measuring devices in remote locations without running wires, installing microwave links or leasing telephone lines.

The DataFlow RTU is a radio telemetry system that operates on either UHF-FM (450 to 470 MHz

with a transmitter power of 2 Watts or 5 Watts) or VHF-FM (150 to 165 MHz, 136 to 151 MHz and 160 to 174 MHz with a transmitter power of 5 Watts). An RTU system operating in the UHF-FM band at 2 Watts with directional antennas and 50-foot towers has an effective range of 20 to 25 miles over level terrain. Changes in the frequency of operation, transmitter power, terrain and antenna structure will affect the range of the link.

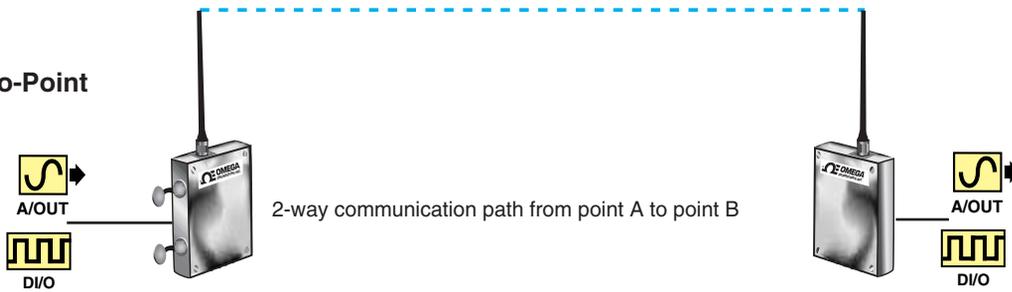
All DataFlow RTU systems require

FCC licensing. Call OMEGA for information on obtaining a license.

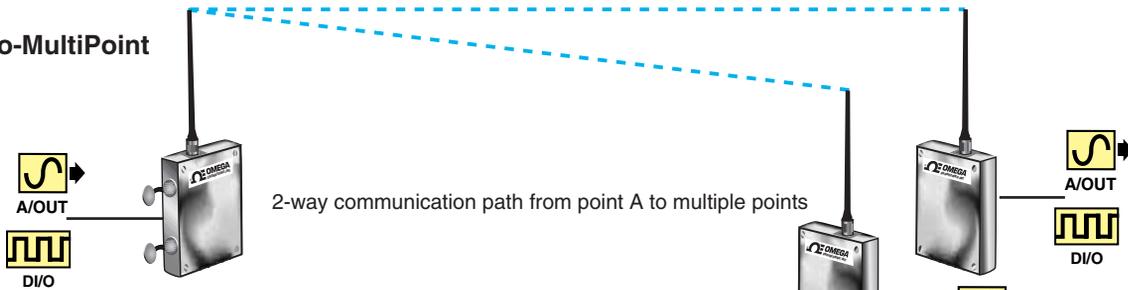
Interconnects

The DataFlow RTU provides a water-tight aluminum enclosure with two bulkhead circular connectors and one antenna port. Each DataFlow RTU comes equipped with a 6' power/serial cable, which provides a connection from the RTU to 12 Vdc power and to an RS-485 serial port. It also comes with a 6' Input/Output cable for connecting external instrumentation.

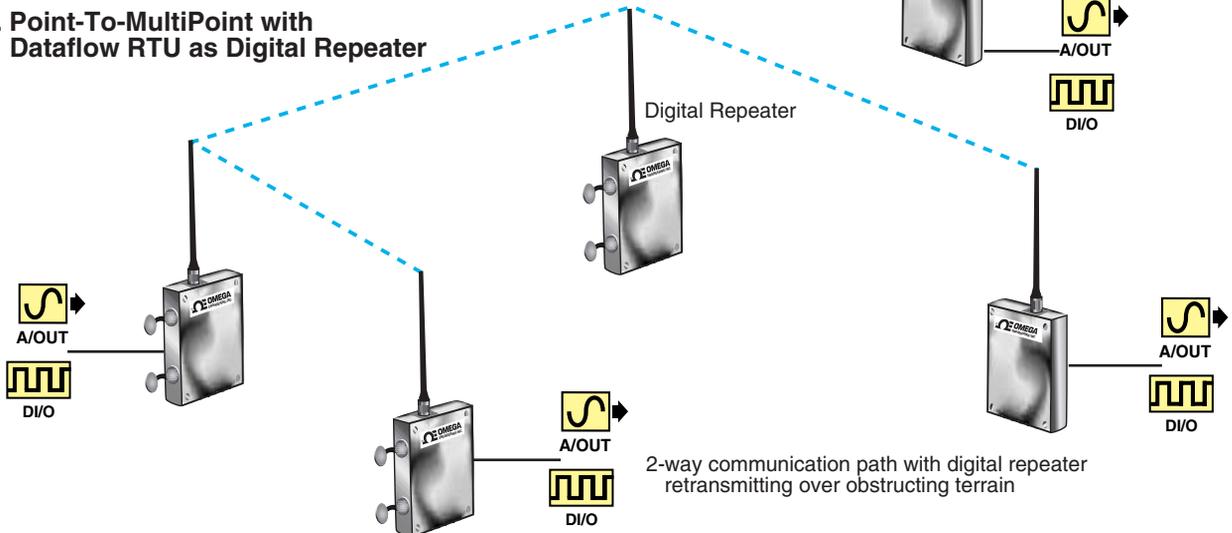
1. Point-To-Point



2. Point-To-MultiPoint



3. Point-To-MultiPoint with Dataflow RTU as Digital Repeater



Software Configuration

All DataFlow RTU's contain identical hardware; the software configuration of a unit makes it perform a particular task. This programmable configuration can be changed by any IBM PC or compatible computer, using the DataFlow RTU's Programming Software and Programming Cable.

Power

The DataFlow RTU can be powered by a dc voltage source that meets the following criteria: between 10 Vdc and 16 Vdc with 12 Vdc nominal, less than 1 V peak-to-peak of ripple, 1.5 A with the transmitter in low power setting and 2.5 A with the transmitter in high power setting.

You can purchase the DataFlow RTU with an eight-cell internal battery holder. With this option, internal AA batteries are used as the power source for the low power setting. An ac to dc adaptor can also be purchased if battery power is not preferred, or if dc power is not readily available at the installation site. It can provide power for the 1.5 A low power setting only.

RS-485 Serial Link

This link permits the user to change the software configuration, and allows the RTU to be controlled by an external computer or PLC, via RTU MODBUS Protocol. The baud rate of this link is programmable between 1200, 2400, 4800, and 9600 BPS.

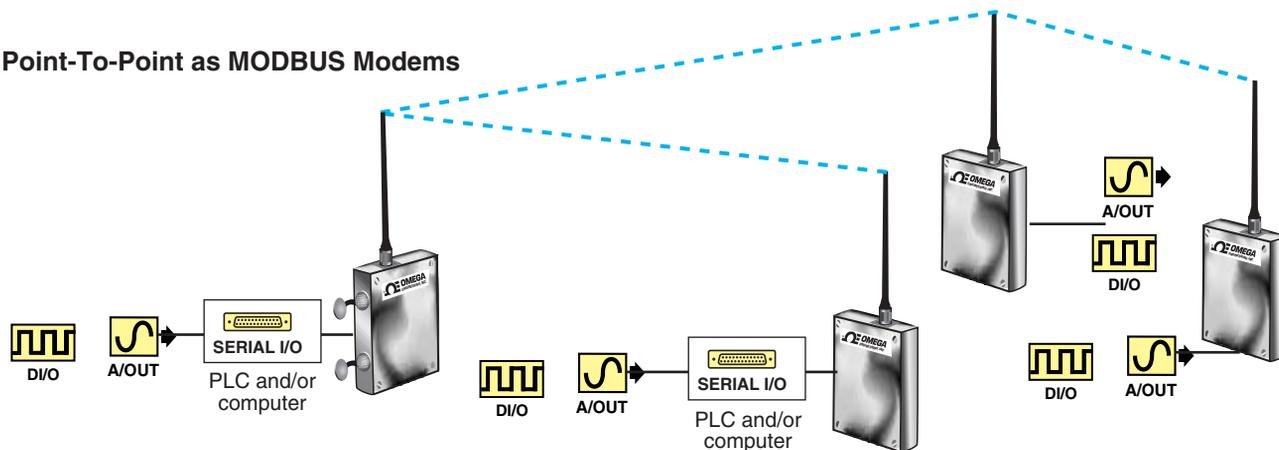
I/O Mapping

I/O mapping is the connection of one DataFlow RTU input to another DataFlow RTU output via radio communication. The current mapping scheme allows any input of any DataFlow RTU to be sent to any output of any other DataFlow RTU.

Digital I/O

The DataFlow RTU provides 6 digital inputs and two digital outputs. These outputs are two dry-contact closure latching relays. They are either OPEN or CLOSED and are controlled by the DataFlow RTU software. You can invert the input state of an RTU unit, which will cause a DataFlow RTU which is reading a switch setting as "HIGH" to transmit the switch status as

4. Point-To-Point as MODBUS Modems



2-way communication path with units serving as MODBUSUS modems

Typical DataFlow-RTU applications

“LOW” to another DataFlow RTU. Inversion allows a NORMALLY OPEN switch to control a NORMALLY CLOSED relay output without external circuitry.

The relays can be programmed to have both initial and fail-safe conditions. The initial condition forces the relays to a desired state at power-on of the device. The fail-safe condition forces the relays to a desired state if an RF data link problem is detected. If a digital output is used for a warning indicator, it is not available to be mapped to the corresponding digital input of the other unit. This means that if a digital output is used for a warning indicator, only one digital signal can be sent to that DataFlow RTU.

Because the relays are latching, they retain the state they are in if power to the DataFlow RTU is lost; they will not go to the OPEN state during a power outage.

Analog Inputs

Up to six analog inputs are provided. These inputs can be of two types: 0 to 5 Vdc voltage or 0 to 20 mA current loop. These inputs are used to digitize the analog signal and transmit it to another DataFlow RTU.

All analog inputs are non-isolated. The user can invert the input state

of a DataFlow RTU if desired, which will cause a DataFlow RTU that reads an analog signal as full scale to transmit the signal status at 0 scale to another DataFlow RTU. This inversion allows a positive transfer function signal to control a negative transfer function signal without external circuitry. Sensor excitation voltage can be supplied by the DataFlow RTU using the Power Out pin. For this configuration, make sure to not exceed the maximum current drive of the pin, and ascertain that your sensor will operate on a supply voltage of $V_{supply}-5$ Volts.

Analog Outputs

Two analog outputs are provided. These outputs can be configured as either a 0 to 5 Vdc voltage or a 0 to 20 mA current output. The analog outputs can be programmed to have both initial and fail-safe conditions. The initial condition forces the output to a desired state at power-on of the device. The fail-safe condition forces the output to a desired state if an RF data link problem is detected. Meter excitation voltage can be provided by the DataFlow RTU using the Power Out pin. If the Power Out pin is used as the excitation supply, make sure that the maximum current drive of the pin is not exceeded and that your indicator will operate on a supply voltage of $V_{supply}-5.5$ Volts.

General Specifications

FCC ID: RTU-150 - AIERIT04-150; RTU-450 - AIERIT04-450

Emission Designator: 10K8FID

Digital Inputs: maximum of 6, 0-5 V

Digital Outputs: 2 isolated latching relays UL/CSA rating: 2 A @ 30 Vdc; 0.5 A @ 110 Vdc; 0.5 A @ 125 Vac

Analog Inputs: maximum of 6

Voltage Mode Range: 0-5 Vdc

Current Loop Mode Range: 0-20 mA

Resolution: 8 bits

Analog Outputs: maximum of 2

Analog Voltage Mode Range: 0-5 Vdc

Current Loop Mode Range: 0-20 mA

Resolution: 8 bits

Radio Communications: FSK, 1200 BPS, proprietary Manchester-Encoded data format

Serial Communications: RS-485;

1200, 2400, 4800, or 9600 BPS;

RTU MODBUS for programming

and external control

Power Requirements: 10-16 Vdc,

300 μ A sleep, 100 mA receive

1.5 A low power transmit, 2.5 A high power transmit

Housing: diecast aluminum, watertight

Dimensions(L x W x H):

4.5 x 3.5 x 2.2" (114 x 89 x 56 mm)

Weight: 1.4 lb (.63 kg)

Operating Temperature: -30 to 60°C (-22 to 140°F)

Storage Temperature: -40 to 80°C (-40 to 176°F)



DataFlow RTU transceivers

Transceiver Specifications

TRANSMITTER

Bandspread: 20 MHz
Freq. Stability: 5 PPM
RF Power Out: 5 W,
 programmable to 2 W
RF Output Z: 50 Ohms
Mod. Dist.: less than 4%
Mod. Input Z: 100 KΩ

RECEIVER

Bandspread: 20 MHz
Freq. Stability: 5 PPM
Sensitivity: .3 μV
RF Input Z: 50 Ohms
Selectivity: 70 dB @30 kHz
 65 dB @25 kHz
Audio Dist.: less than 3%



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To Order (Specify Model Number)

Model Number	Price	Description
RTU-150-EUSDC	\$1546	DataFlow RTU Radio Telemetry transceiver, VHF (136-151 MHz)
RTU-150-OUSDC	1546	DataFlow RTU Radio Telemetry transceiver, VHF (150-165 MHz)
RTU-150-FUSDC	1546	DataFlow RTU Radio Telemetry transceiver, VHF (160-174 MHz)
RTU-450-OUSDC	1546	DataFlow RTU Radio Telemetry transceiver, UHF (450-470 MHz)
RTU-450-GUSDC	1546	DataFlow RTU Radio Telemetry transceiver, GOVERNMENT (400-430 MHz)
RTU-PCPK	310	Programming Kit, includes DOS software, cable, power supply and operator's manual (one required to configure RTU's)
RTU-AFP-150	16	VHF Antenna, short range (1 mile or less), Omni Directional
RTU-AFP-450	16	UHF Antenna, short range (1 mile or less), Omni Directional
RTU-RYA-15	192	VHF Antenna, long range, 6.5 dB gain, Directional
RTU-RYA-45	120	UHF Antenna, long range, 10 dB gain, Directional
RTU-BAT/HOLD	208	Rechargeable batteries with holder (use if not powering from a dc voltage source)
RTU-25104600	42	Mounting bracket for transceivers
RTU-RAC-05	108	Coaxial cable, 50', RG-8A/U with PL-259 connectors. Connects antenna to RTU (use when mounting antenna away from RTU)
RTU-RAC-10	172	Coaxial cable, 100', RG-8A/U with PL-259 connectors. Connects antenna to RTU (use when mounting antenna away from RTU)
RTU-PS	42	Power supply, 110 Vac to 13.5 Vdc (can be used to power RTU's when dc power is not readily available. For low power, 2 Watt setting only. One per RTU)
DCP-485-S	239	RS-232 (9-pin female) to RS-485 converter (use if an RS-485 port is not available on the PC for programming the RTU)

Each RTU comes with 1 power/serial cable and 1 input/output cable. One programming kit is required to configure RTU's. One antenna is required for each RTU. A minimum of two RTU's is required per system. The RTU-PCPK comes with a power supply to power the RTU while programming. Additional power supplies may be needed to power RTU's if dc power is not available at the installation site. Other antennas are available on special request. Contact Engineering Department for details

Ordering Example: Two RTU-150-EUSDC transceivers, two RTU-AFP-150 antennas, RTU-PCPK programming kit, two RTU-25104600 mounting brackets, OMEGACARESM 1-year extended warranty for both RTU-15-EUSDC's (adds 1 year to standard 1-year warranty), \$3092 (2 x 1546) + 32 (2 x 16) + 310 + 84 (2 x 42) + 300 (2 x 150) = \$3818

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