I/A Series® Remote Terminal Unit (RTU)
RTU50 Dual Communications Modules

The I/A Series® RTU50 features a family of Dual Communications modules providing connectivity to Master Stations and other human machine interfaces over a range of different communication media and supporting a wide range of protocols.

The range of Dual Communications modules comprises:

- ITU-T V.28 (RS-232)
- ITU-T V.11 (RS-485/RS-422)
- Glass fiber optics.

This range allows communication over a wide variety of media such as leased lines, radio, microwave, fiber optic, dial-up links, power-line carrier, and other such infrastructure.

Each Dual Communications Module provides two independent channels for connection to two separate Master Stations. Optionally, the second channel can be used as a backup to the primary channel.

To ensure reliable communication, each Dual Communications module is fully intelligent and independently responsible for sending and receiving data, while providing error detection and control of the communications protocol.

The Dual Communications modules support a wide variety of current and legacy protocols. The supported protocols are:

- DNP3
- IEC 60870-5-101
- IEC 60870-5-103
- Conitel (C2025, C300, C3000)
- WISP+
- LN57
- Harris 5000/5500 and 6000.

Through this flexibility in protocol and communications media support, the I/A Series RTU 50 is ideally suited for new and retrofit SCADA installations. In addition, through the dual communication technology on each module, secure and reliable communication can be achieved over a wide range of communication architectures.

FUNCTIONAL DESCRIPTION

The Dual Communications modules in the I/A Series RTU50 are based on intelligent communication cards, with each card featuring a microprocessor, and associated random access memory (RAM) and read only memory (ROM). The on-board processor sends and receives messages, and controls the implemented communication protocol. This information is passed to the I/A Series RTU50 Master Processor module via shared memory on the Dual Communications module.

Error detection algorithms appropriate for each supported protocol monitor communication integrity and guarantee a high level of data integrity. The communication subsystem plays an important part in synchronization from the Master Station. The Dual Communications module implements the protocol-specific requirements to ensure the accuracy demanded in time-critical SCADA applications.

Each Dual Communications module features two independent communications channels. Each channel can be configured to communicate with two separate Master Stations, or the second channel can be configured as a backup to the master channel.

Separate data sets can be configured when operating in dual communications mode to two independent Master Stations. These data sets can be equivalent, disjointed, or intersecting sets of either the complete I/A Series RTU50 database or a subset of it. Therefore, great flexibility is provided in what data is available to each Master Station.

In addition, the I/A Series RTU50 main processor maintains its own independent Sequence of Events (SOE) buffers, digital input momentary detect information, and energy accumulators. Thus complete independent operation to each Master Station is ensured.

With the second port as backup to the first, identical data sets and buffer sets are provided to the Master Station. The backup port is always active, and may be scanned at any time, allowing speed of failover to be controlled by the Master Station.

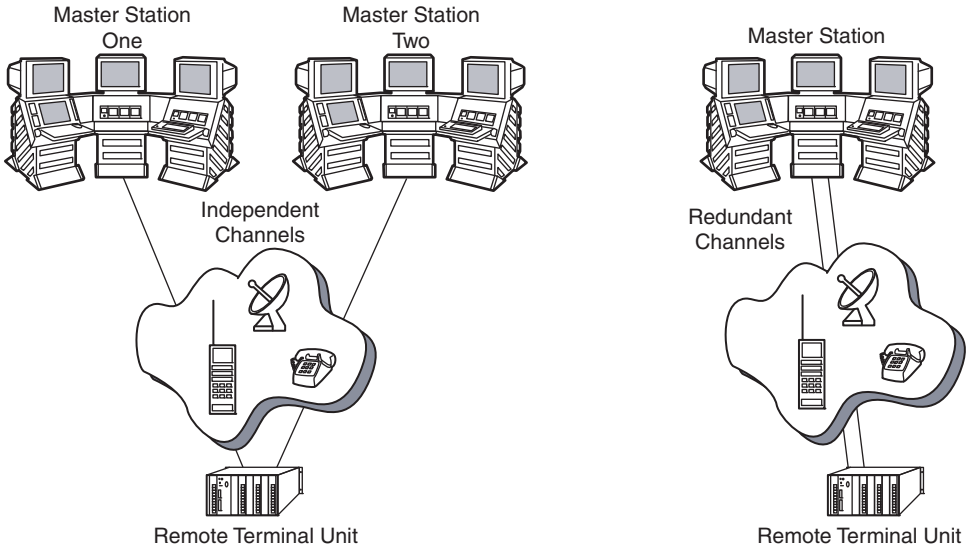

Figure 1. Typical Configurations

V.28 DUAL COMMUNICATIONS MODULE

The V.28 Dual Communications module provides two digital RS-232-C compatible communication channels with data rates of 300 to 9600 baud standard, and up to 64 Kbaud with a single channel only.

The V.28 Dual Communications module supports a range of current and legacy protocols. The wide use of the V.28 interface makes the V.28 Dual Communications module suitable for interfacing to many different communications media. This together with the broad range of supported protocols, makes the V.28 Dual Communications module an ideal choice for both greenfield and retrofit sites, and for small to large input/output counts.

V.28 Dual Communication Module is enhanced to support V.23/BELL 202 interface via IG202T-R38 Modem from Data Connect Enterprise.

V.11 DUAL COMMUNICATIONS MODULE

The V.11 Dual Communications module provides two high speed digital RS-422/RS-485 compatible communication channels.

The V.11 Dual Communications module is ideally suited to demanding greenfield SCADA projects (particularly in the electricity transmission and large distribution substation environment).

OPTICAL DUAL COMMUNICATIONS MODULE

The Optical Dual Communications module provides two optical (glass) communication channels.

The Optical Dual Communications module is particularly suited to greenfield SCADA applications where large input/output counts require frequent scanning back to a central or local Master Station.

FUNCTIONAL SPECIFICATIONS

V.28 Dual Communications Module

PROCESSOR TYPE
Z80180

INTERFACE
V.24/RS-232-C (V.28) DTE

TERMINATIONS
DB15-pin female

COMMUNICATIONS CONTROLLER
Z85C30/Z85230

NUMBER OF CHANNELS
Two

DATA RATES (1)
300, 600, 1200, 2400, 4800, 9600. Up to 64000 single channel only.

OPERATING MODES
Asynchronous/synchronous

RADIO INTERFACE
Via suitable modem

V.23/BELL 202 INTERFACE
Via Data Connect Enterprise IG202T-R38 Industrial Grade Modem

SUPPORTED PROTOCOLS (2)
DNP3 Master and Slave, Conitel C2025 Master and Slave, Conitel C300 & C3000 Slave, Wisp+Master and Slave, IEC 60870-5-101 Slave, LN57, Harris 5000/5500 and 6000

POWER AVAILABLE
±12 V 50 mA maximum per channel

POWER REQUIREMENTS
450 mA at 5 V

TRANSIENT PROTECTION (3)
IEC 61000-4-4 Level 3 (1 KV EFT)

NOTE

IG202T-R38 from Data Connect Enterprise is proven to operate with V.23/Bell 202 signals with V.28 DCB as a substitute for the V.23 DCB.

V.11 Dual Communications Module

PROCESSOR TYPE
Z80180

INTERFACE
ITU-T V.11 DTE

TERMINATIONS
DB15 male connector ISO 4903 X.27/V.11

COMMUNICATIONS CONTROLLER
Z85230

NUMBER OF CHANNELS
Two

DATA RATES
300 to 9600 dual channel, up to 64000 single channel only

OPERATING MODES
Asynchronous/synchronous

RADIO INTERFACE
Via suitable modem

LINE TERMINATION
V.11 drivers/receivers (RS-422, can be wired as RS-485)

ISOLATION
Direct connection

SUPPORTED PROTOCOLS
DNP3 Master and Slave, LN57

POWER AVAILABLE
±12 V 50 mA maximum per channel

POWER REQUIREMENTS
450 mA at 5 V

TRANSIENT PROTECTION
IEC 61000-4-4 Level 3 (1 KV EFT)

CONTINUOUS TRANSMIT PROTECTION
Time out on long RTS (10 seconds)

(1) Only 1200 baud is supported while interfacing V.28 DCB with IG202T-R38 Modem.
(2) DNP3 Master and Slave, Conitel C2025 Master and Slave, Conitel C300 & C3000 Slave protocols are supported when using V.28 DCB with IG202T-R38 Modem.
(3) Only in Stand alone mode. When connecting external modems, these levels are not applicable.

FUNCTIONAL SPECIFICATIONS (CONTINUED)

Optical Dual Communications Module

PROCESSOR TYPE
Z80180

INTERFACE
Optical (full duplex)

COMMUNICATIONS CONTROLLER
Z85230

NUMBER OF CHANNELS
Two

DATA RATES
300 to 9600 dual channel, up to 64000 single channel only

SUPPORTED PROTOCOLS
DNP3 Master and Slave, IEC 60870-5-103 Master, LN57

OPERATING MODES
Asynchronous/synchronous

MAXIMUM FIBER LENGTH
2000 meter (Hewlett-Packard™ glass)

OPTICAL CONNECTOR
ST connector (Hewlett-Packard glass) 820 nm wavelength, multimode 62.5/125 μm glass fiber
1 core transmit
1 core receive

POWER REQUIREMENTS
450 mA at 5 V

ENVIRONMENTAL SPECIFICATIONS

Operating Temperature

STANDARD
0°C to + 60°C (32°F to 140°F)

Humidity

10 to 95% (noncondensing)

PHYSICAL SPECIFICATIONS

Physical Size

160 x 127.3 mm bare board
185 x 145 x 25 mm - including handle

ORDERING INFORMATION

Part Number	Description
V.28 Dual Communications Module	
SY-0399191	RTU50 Communications Module V.28 Conitel (C3000, C2025, C300)
SY-0399029	RTU50 Communications Module V.28 Harris 5000/5500, 6000
SY-0399034	RTU50 Communications Module V.28 LN57
SY-0399035	RTU50 Communications Module V.28 LN57 Dialup
SY-0399193	RTU50 Communications Module V.28 DNP3
SY-0399195	RTU50 Communications Module V.28 IEC 60870-5-101
SY-0399197	RTU50 Communications Module V.28 WISP+
V.11 Dual Communications Module	
SY-0399022	RTU50 Communications Module V.11 LN57 Sync
SY-0399032	RTU50 Communications Module V.11 LN57 Async
SY-0399162	RTU50 Communications Module V.11 DNP V3.00 Master/Slave
Glass Fiber Optic Dual Communications Module	
SY-0399025	RTU50 Communications Module Glass Optical LN57
SY-0399063	RTU50 Communications Module Glass Optical DNP3
SY-0399073	RTU50 Communications Module Glass Optical IEC 60870-5-103

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