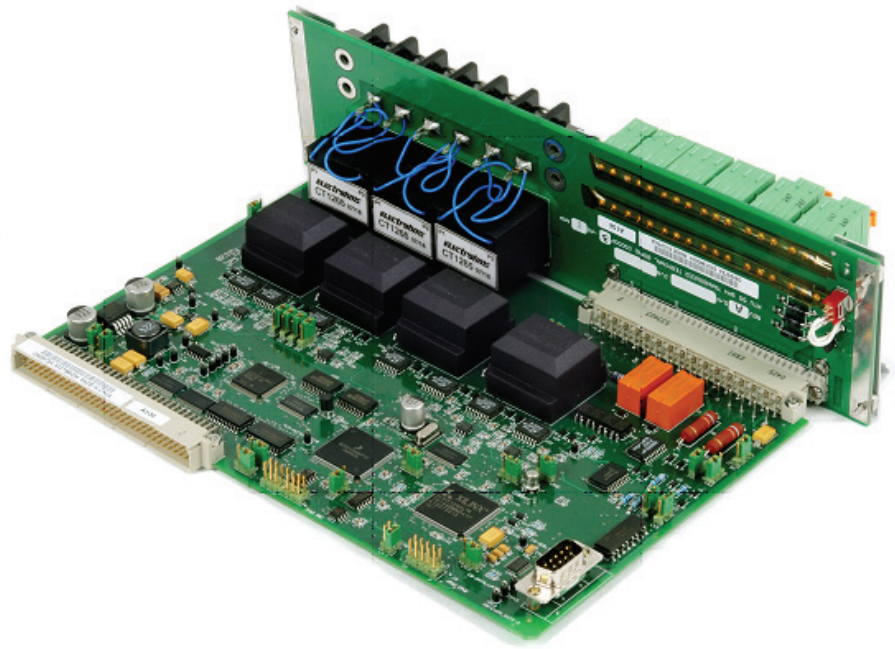
I/A Series® Remote Terminal Unit (RTU)
RTU50 3 Phase Digital Transducer Module



The RTU50 3 Phase Digital Transducer Module provides a direct interface to voltage and current transformers, replacing the need for external transducers.

Voltage and current inputs to the module are used by the onboard digital signal controller to calculate the electrical quantities of Frequency, Volts, Amps, Phase Angle, Sin of current phase angle, Watts, Power Factor, VARs, VA, and Positive, Negative and Zero Phase Sequence Voltages.

FEATURES

- Simultaneous sampling eliminates skew error
- Replaces MW, MVAR, MVA, volts, amps, frequency, and power factor transducers for single and three phase circuits
- Volts, frequency, and phase angle for a fourth voltage input
- Two digital inputs and outputs provided for use as additional I/O
- 0.5% accuracy
- Operates at 40 MHz
- Current Transformers (CT) mounted on the termination board can be disconnected without breaking the CT circuit
- Current and voltage transformers can be connected in either a Star or Delta configuration
- Current transformers have dual windings to protect against open circuits

- Dual sync-check functions permit the RTU to automate circuit breaker closure synchronization interlocking and control.

MODULE DESCRIPTION

The main board contains the Digital Signal Controller (DSC) which has on chip RAM, Flash, EEPROM, and four, 4-channel 12-bit Analog/Digital Converters (ADC). This board also has Amplifiers and Anti-Aliasing Filters.

The Voltage Transformers (VTs) are mounted on this board. The interface between Electrobus is by a dual port memory (DPRAM) on main board. The Current Transformers (CTs) are mounted on terminal board to avoid disconnection of the CT current loop.

Two 4 channel ADCs are used to simultaneously sample eight channels. This simultaneous sampling eliminates any skew error. Seven channels are used to input the isolated transformer signals; the eighth channel is used to monitor temperature, allowing for dynamic temperature conversion. The temperature sensor is available on chip DSC. See Figure 1.

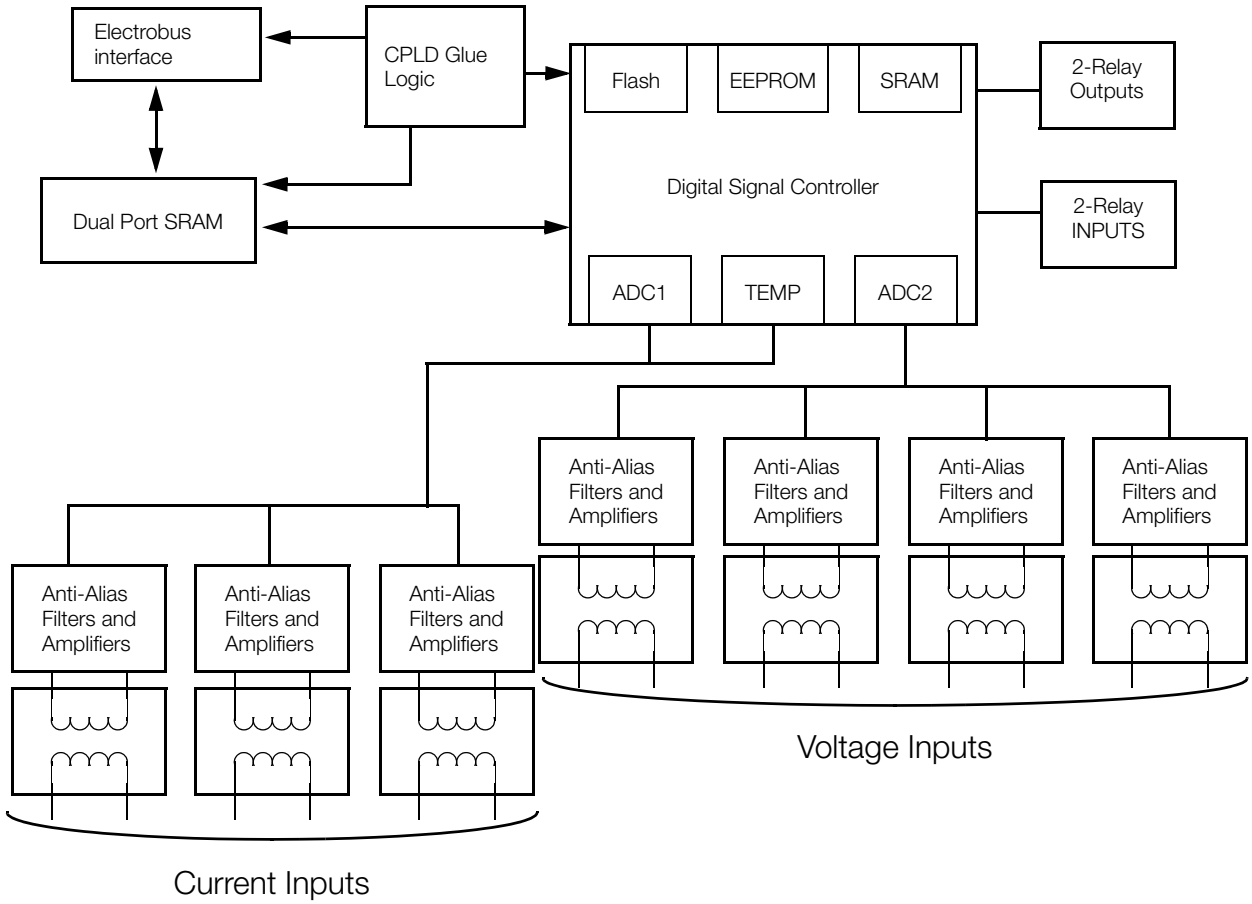


Figure 1. RTU50 3 Phase Digital Module Functional Block Diagram

Front Panel Inputs

Four voltage inputs are provided as shown in Figure 2. These are connected to voltage field transformers. Three of the inputs are normally used to measure the voltage upstream of a circuit breaker; the fourth is used to measure the voltage downstream of the breaker. This fourth input is used in the synchronization check application.

Three 2 terminal current inputs are provided, which are connected to current field transformers. These inputs are available in either 1 or 5 A nominal signal configurations.

In addition, a utility digital input and output are provided, which follow the specifications of the RTU50 Analog/Digital Input Module.

Front Panel Outputs

Also provided are two digital outputs that meet the specifications of the RTU50 Pilot Relay outputs. These outputs along with the digital inputs explained in the previous section are used to provide additional general purpose I/O.

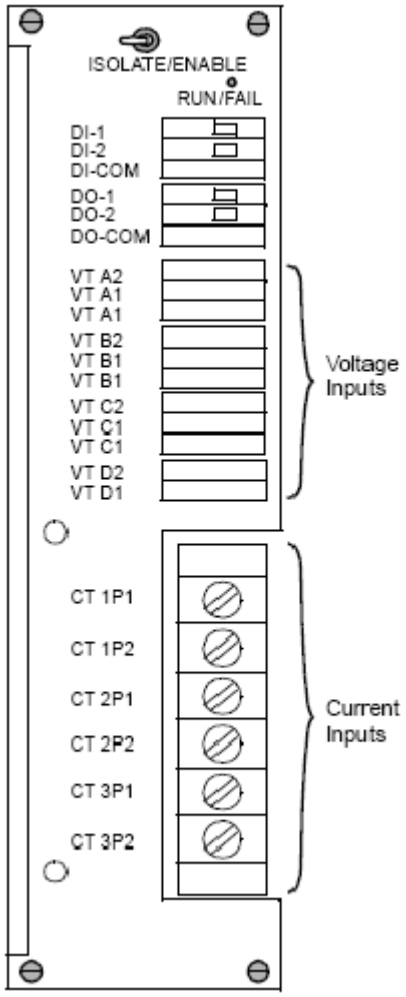


Figure 2. Front Panel

PHYSICAL SPECIFICATIONS

Power Supply
RTU50 Electrobus Interface

Physical Size
262 mm x 196 mm x 71 mm

Processor Type
MC56F8346 - 40 MHz (100 nS cycle) DRAM
16 KB x 16 Cypress CY7C026 (25 nS)

INTERNAL FLASH
64 KB x 16

INTERNAL EEPROM
8 KB x 16

ADC
Internal 4 x 4 ch (2 ch. simultaneous)
+3V input range, unipolar
±2 ppm/oC reference error
±1 count relative capacity

ENVIRONMENTAL SPECIFICATIONS

Operating Temperature

STANDARD
0°C to 60°C (32°F to 140°F)

EXTENDED(1)
-20°C to +70°C (-4°F to 158°F)

Humidity
10 to 95% RH (noncondensing)

(1) Extended temperature range modules are available on request.

FUNCTIONAL SPECIFICATIONS

Limits of Nominal Range

VOLTS
Nominal 63.5 V or 110 V user configurable

AMPS
Current ranges of 1 or 5 A dictated by the part number ordered

FREQUENCY
30-110% (50 Hz and 60 Hz)

Overload Capacity

TWO HOUR CONTINUOUS OVERLOAD

Current Inputs
125% of nominal

Voltage Inputs
125% of nominal

SHORT DURATION

Current Inputs
20 times rated current for 2 seconds

Voltage Inputs
2 times rated voltage for 2 seconds

Isolation
2 kV rms

Transient Protection

Meets IEC 255-4 (1976) Class 3;
IEEE C37.90.1-1974; IEC 255-22-4; IEC 801-4;
AS 2481-1981

Anti-Aliasing Filter

7 x switched capacitor type

Temperature Reference

Onboard, Class 2 accuracy

Bandwidth

250 Hz

CPU Update Time

All quantities every cycle; the CPU performs calculations every power station cycle; CPU updates are performed every 100 msec

Accuracy

0.5% of full scale output at reference conditions, as per AS1384-1973 over the following ranges

VOLTS
80% to 110%

AMPS
20% to 125%

FREQUENCY
95% to 105%

Burden of Measuring Circuit

Not to exceed:

0.1 VA per element for voltage circuit
0.1 VA per element for current circuit

ORDERING INFORMATION

Part Number	Description
0399140	Phase Digital Transducer Module (1 Amp, 0.5% Accuracy)
0399142	Phase Digital Transducer Module (5 Amps, 0.5% Accuracy)
1014601	Serial null modem cable for field upgrades of firmware

Invensys Operations Management
5601 Granite Parkway Suite 1000
Plano, TX 75024
United States of America
http://iom.invensys.com

Global Customer Support
Inside U.S.: 1-866-746-6477
Outside U.S.: 1-508-549-2424 or contact your local Invensys representative.
Email: iom.support@invensys.com
Website: http://support.ips.invensys.com

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