MODBUS Serial Communication Card

PRODUCT HIGHLIGHTS

- Four Configurable Serial Ports
- MODBUS Serial Master and Slave Protocol
- Supports RS232 and RS485 protocol
- Supports RTU and ASCII Transmission Mode
- Supports Full- and Half-duplex Transmission Mode
- Supports Normal and Null Modem Serial Wiring
- 32 MBytes SDRAM, 32 MBytes Flash Memory
- LED Status Indicator
- Hot Swappable

PRODUCT OVERVIEW

The 3019/00-000 MODBUS Serial Communication Card connects to the 3099/25-100 Single Termination Module - MODBUS Serial. The termination module provides four serial ports for communications with MODBUS-compatible controllers. Each serial port has 4 DIP-switches that are used to designate the protocol. It supports integration of an RTP control system with equipment using the MODBUS Serial protocol. All hardware configuration options are located on the 3099/25-100 termination module.

The MODBUS Serial Communication Card manages all aspects of the protocol and data exchange including message translating and formatting, message checking, responding to MODBUS controllers with proper acknowledgments, error, or success codes, and protocol data byte ordering. This built-in intelligence unburdens the RTP controller’s processor from the responsibility of managing the MODBUS network.

The card performs bus checking functions on the input, output, and command operations. Data is sent twice, once normal and once inverted. The results are then compared and the data is not acted upon unless the comparison passes. If the check does not pass, an error bit is set in the status register.

The Contention checking circuit monitors the bus command signals for any simultaneous occurrence of two or more command signals. If a simultaneous occurrence is detected, an error bit is set in the status word.

Each MODBUS port can be configured to operate either as a MODBUS master device that requests read and write data transfers from MODBUS slave devices, or as a MODBUS slave device that responds to requests from a MODBUS master. It supports multiple MODBUS servers, asynchronous read and write functions, a multiple outstanding read and write request queue, and coil and discrete I/O formats.

Its “hot swappable” design has backplane interface logic to protect the card from damage, and to prevent control and data signal degradation on the bus, when plugged into a live RTP chassis. A front panel LED indicates overall health status of the card.

RTP is the Best Technology for Your Investment, Here’s Why:

The 3000 is a multi-processor architecture that delivers exceptional Performance and Comprehensive Diagnostics. The results speak for themselves: A Reaction Time of 12 msec, true 1 msec SOE (Analog and Digital), an MTBF of greater than 3000 years, an MTTFS of greater than 4000 years, and a PFDavg of 5x10⁻⁵. Compare these numbers to any other system.

Built-in Proof Test Diagnostics means it will never be necessary to shut down at the proof test interval. Unlimited online downloads of logic and configuration changes do not require a periodic shut down like other systems. Compare this functionality to any other system.

Net Suite Software: One-time price includes unlimited use of Logic Development, Alarm Manager, Data Archive and Historian, and HMI without hardware or software keys. Compare this functionality and price to all other systems.

Finally, a Safety Instrumented System (SIS) should always take the process it protects to a safe state when it is required to do so, and it should never interfere with the operation of the process at any time. The 3000 does this better than any other system.
**SPECIFICATIONS**

**Isolation**
500 V AC/DC field to RTP chassis ground

**Power Requirements**
+5V DC @ 1.4A

**Environmental**
- **Operating Temperature Range:** –20ºC to +60ºC
- **Storage Temperature Range:** –25ºC to +85ºC
- **Relative Humidity Range:** 10% to 95%, non-condensing

**User Connectors**
- **Number:** 4
- **Type:** Serial, user configurable
- **Protocol:** RS-232 and RS-485
- **Serial Wiring:** Null modem and Normal

**Supported MODBUS Functions**

<table>
<thead>
<tr>
<th>Code</th>
<th>Function</th>
<th>Supported Port</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Master</td>
</tr>
<tr>
<td>01</td>
<td>Read Coils</td>
<td>✓</td>
</tr>
<tr>
<td>02</td>
<td>Read Discrete Inputs</td>
<td>✓</td>
</tr>
<tr>
<td>03</td>
<td>Read Holding Registers</td>
<td>✓</td>
</tr>
<tr>
<td>04</td>
<td>Read Input Registers</td>
<td>✓</td>
</tr>
<tr>
<td>05</td>
<td>Write Single Coil</td>
<td></td>
</tr>
<tr>
<td>06</td>
<td>Write Single Register</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Force Multiple Coils</td>
<td>✓</td>
</tr>
<tr>
<td>16</td>
<td>Preset Multiple Registers</td>
<td></td>
</tr>
</tbody>
</table>

**Electrical Specifications**

- **µProcessor:** RC4000 RISC processor
- **Clock Speeds:**
  - CPU: 133 MHz
  - System Bus: 66 MHz
- **Memory:** 32 MBytes SDRAM, 32 MBytes Flash
- **MODBUS Protocol:** Serial Master/Slave
- **Transmission Mode:** RTU Full-duplex, RTU Half-duplex, ASCII Full-duplex, ASCII Half-duplex

**RS-485 Interface**
- **Mode**: Full/Half duplex
- **Receiver Input Resistance**: 24KΩ
- **Protection**: Current Limiting
- **Data Rate**:
  - Max: 115.2 kbaud
  - Min: 1200 baud

**RS-232C Interface**
- **Mode**: Full Duplex
- **Receiver Input Resistance**: 5KΩ (max)
- **Data Rate**:
  - Max: 115.2 kbaud
  - Min: 1200 baud

**Termination Module**
- **3099/25-100** Single Termination Modbus Serial Termination Cable Included with 3019/00-000 card

*Consult factory for a complete list of all available terminations*

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