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IEEE 488/GPIB Bus Interface

4899

GPIB<->MODBUS INTERFACE

- Converts simple ASCII commands into Modbus RTU messages.
  Relieves user from having to format messages and do CRC checking.
- Provides both single ended RS-232 and balanced RS-422/RS-485 serial signals.
  Connects to single and multiple Modbus devices.
- GPIB Interface is IEEE-488.2 Compliant.
  Meets latest GPIB Standards.
- GPIB Address can set by SCPI commands
  Avoids having to open the case to set the address.
- Saves GPIB and serial interface settings in an internal E²ROM.
  Configure unit without having to remove the cover.
- Front panel LEDs show address and status.
  Visual indication of operation and test status
- Small 1 U high, metal box design has CE approval
  Small size with full EMI/RFI protection.

CE Approved

DESCRIPTION

ICS's 4899 GPIB<->Modbus Interface is an IEEE 488.2/GPIB to Serial Interface that adapts Modbus slave devices to the GPIB or HP-IB bus. The 4899 lets the user send simple read-write messages on the GPIB bus to control and query slave Modbus devices. The 4899 does all of the Modbus message formatting and error checking. The 4899 has both RS-232 and RS-485 interfaces so it can be connected directly to a single Modbus slave device or it can be connected to multiple Modbus devices via an RS-485 network.



4899 Modbus Interface

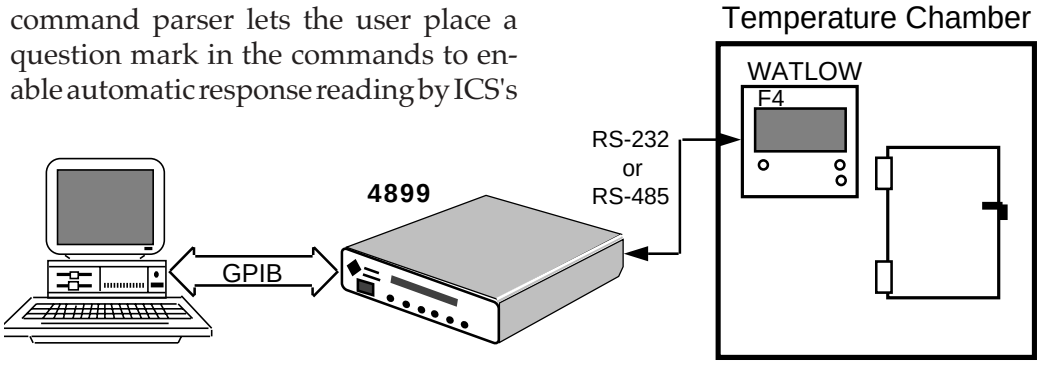
The 4899 is packaged in ICS's small minibox™ case that can be rack mounted in a 1 U high space. Connections to the GPIB bus and the Modbus are made via standard IEEE 488 and a 25-pin serial connectors on the 4899's rear panel.

Operation

The user sends commands to the 4899 that sets the Modbus device address, specifies the register to be read or written and the data value. The 4899 converts these commands into the Modbus RTU format, adds the CRC checksum and transmits the messages to the Modbus device. Received messages are checked and the responses to queries are outputted to the GPIB bus when the 4899 is next addressed to talk. The 4899's command parser lets the user place a question mark in the commands to enable automatic response reading by ICS's GPIB Keyboard Control program and other programs. Modbus communication faults, exception messages and other errors are reported to the user through a Modbus error register in the 4899's 488.2 Status Structure. The user can set up the 4899's Status Structure to generate a SRQ on an error or simply read the Modbus Error register if a problem occurs. Application Note, AB48-25 describes how to use the 4899 and 4809 to control a Modbus device and includes a example Visual Basic control program.

Configuring

The 4899's SCPI command parser lets the user configure and query the 4899's interface settings with SCPI commands. The user can enter an IDN message to personalize the 4899 as part of his own system. The *SAV 0 command saves the current configuration setting and Modbus device address in a nonvolatile E²ROM so it can be recalled when the 4899 is powered-on or reset.



Interfacing a Watlow Controller to the GPIB Bus

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IEEE 488 Bus Interface

The 4899's 488 Bus Interface meets IEEE STD 488.2-1987 and has the following capabilities:

SH1, AH1, T5, L3, SR1, PP0, DC1
RL0, DT0, C0 and E1/E2 drivers

Bus drivers incorporate power up/down protection to prevent glitching the bus during power turn-on.

Address Capability
Primary addresses 0-30.

Buffers

GPIB Input	2 Kbytes
GPIB Input	1 Kbytes
Serial Input/Output	256 bytes

Status Reporting Structure
IEEE-488.2 and SCPI Status Byte, ESR, Questionable and Operational Registers.

SRQ Generation
SRQs are generated per the IEEE-488.2 specification if the unit is not addressed to talk, if SRQs are enabled and if an enabled register bit occurs.

488.2 Common Commands
*CLS, *ESE, *ESE?, *ESR?, *IDN?, *OPC, *OPC?, *PSC, *RST, *SAV, *SRE, *SRE?, *STB, *TST?, AND *WAI.

SCSI Commands
The 4899 conforms to the SCPI 1994.0 Specification and uses SCPI commands to set:

GPIB Bus Address
External GPIB Address Enable
Baud rate select
Data bits 7 or 8
Stop bits 1 or 2
Parity Odd, Even or None
RS485 Half-Duplex operation
Talk Format HEXlist or ASCii

Serial Interface

Full duplex serial interface with single ended RS-232 and differential RS-422 (RS-485) signals. Signal selection made by jumpers on the 4899. RS-485 half-duplex operation enabled with a SCPI command.

RS-232 Signals	TxD, RxD, RTS, CTS, DSR and DTR
RS-422 Signals	Tx and Rx pairs
Baud Rates:	300, 600, 1.2K, 2.4K, 4.8K, 9.6K, 19.2K and 38.4K baud
Data Bits	7 or 8 bits
Parity	Odd, even or none
Stop Bits	1 or 2

Modbus Commands

Following commands accept ASCII decimal values or HEX values starting with #h. Code is the Modbus RTU command code.

Cmd	Code	Function
C n	-	Sets Device Address
L w	0x08	Performs loopback test
R reg, n	0x03	Reads *n* words from register *reg*
W reg, w	0x06	Writes to a single register *reg*
WB reg, n, w...w	0x10	Writes multiple words *n* to a single register *reg*
D time		Sets serial timeout in ms
E?		Queries Modbus Error Register

Compatible Controllers

The following is a partial list of compatible Modbus RTU Controllers:

Watlow F4 series
Watlow 96 series
Watlow SD series

Physical

Size
7.45"L x 5.57"W x 1.52"H
(18.92cmL x 14.15cmW x 3.86cmH)

Weight
3lbs. (1.4kg.) including adapter

Temperature

Operating	-10 °C to +55 °C
Storage	-20 °C to + 70 °C

Humidity
0-90% RH without condensation

Shock/Vibration
Normal handling only

Construction All metal case

Power 9 to 32 Vdc @ 3.5 VA

Included Accessories

Instruction Manual
3.5 in Configuration Program Disk
UL/CSA/VDE approved AC power Adapters provided for:
US - 115±10% Vac, 60 Hz (std)
Europe - 230±10% Vac, 50/60 Hz
UK - 230±10% Vac, 60 Hz
Japan - 100±10% Vac, 50/60 Hz

Included Accessories

Instruction Manual
Configuration Disk with menu driven configuration programs for NI, ICS and HP GPIB Controller Cards and sample programs.

ORDERING INFORMATION

	Part Number
GPIB - Modbus Interface (includes Manual and Configuration Disk)	4899
GPIB - Modbus Interface with 230 VAC adapter. Specify plug style: -E (Europe), -B(UK), -A(Australia)	
GPIB - Modbus Interface (unit only)	114932

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