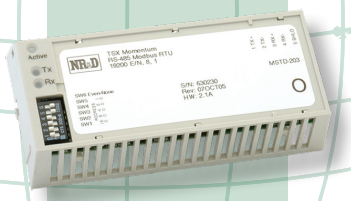
NR&D

MST

Momentum Serial Communications Adapter



Description

Niobrara's MST family of products are serial communications adapters for TSX Momentum® I/O. Two variants are available; the MSTD is equipped with an RS-485 port for multidrop applications, and the MSTS utilizes an RS-232 port for point-to-point communications. Each MST variant can have multiple versions, designated by a three digit suffix; e.g. MSTD-101.

Each MST version has a fixed baud rate and protocol. The first protocols avail-able for the MST are Modbus® RTU and Modbus ASCII; other protocols will be added as the need arises. Contact the factory to obtain part numbers for other protocols and baud rates.

The Modbus versions of the MST mimic the registers of Modicon's Ethernet Communication Adapter with additional registers and capabilities. For example, the MST makes it possible to read the state of the outputs (4x registers 101 through 132). The MST also contains a configurable watchdog timer to zero the output registers whenever communication is lost.

"... mimic the registers of Modicon's Ethernet Communications Adapter with ad-ditional registers and capabilities."

Applications

- Add Momentum I/O to a Modbus serial network.
- Connect to a modem for dial-up I/O
- Put Momentum I/O on a Modbus or RNIM radio network
- Put Momentum I/O on a POWERLOGIC® or POWERLINK® network
- Put Momentum I/O on a Modbus power management system
- Put Momentum I/O on a POWERLINK G3 panel (MSTD-004)
- Provide a serial interface for motor drives
- Build a Serial to Seriplex™ bridge

Benefits

- No programming required
- Ability to read outputs
- Least expensive communications adapter for Momentum
- Watchdog operates on all 32 output registers
- Add multiple I/O to Ethernet when out of IP addresses (requires a bridge)
- Configurable default output condition

Possible Future Protocols

- RNIM
- PNIM / Plogic
- Siemens Building Automation FLN (P1)

Momentum Compatibility

The MST supports any Momentum I/O base, auto-detects the base ID code and reports this in 4x register 204. The MST does not support any option adapters.

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Power

The Momentum base powers the MST through the base/tophat connector. The MST power consumption is 0.25 watts, far less than the 5-watt minimum power that Modicon specifies Momentum bases provide. Devices powered by the +5 Volts on the RS-232 connector must not draw in excess of 100mA since this may exceed the power output of the Momentum base.

Configuration

The address and parity of the module is configured via a six-position DIP-switch on top of the module. Valid addresses are 1 through 31. Power-up and default output conditions are user configurable by setting the outputs and writing the default-save register. This feature permits automatic base configuration on power-up.

The communication-loss watchdog timer is configured via Modbus write. The default timer value is 30 seconds. The default output condition is all outputs off. Future MST versions may have other configuration options.

"No programming required ... Least expensive Communications Adapter for Momentum."

LEDs

The MST has three LEDs. The green LED indicates the module is powered and configured (on steady) or powered but not configured (flashing slowly). The amber LEDs indicate when the module is transmitting (TX on) and receiving (RX on).

Statistics

There are statistics registers to indicate tophat/base communication health, last I/O module error, and I/O module communication error count.

Pinouts

The following tables illustrate the connector pinouts for each MST variant.

RJ45 RS-232 Port			
Pin	**Function**	**Pin**	**Function**
1	+VDC (100 mA max output)	5	Signal GND
2	No Connection	6	RTS (out)
3	TX (out)	7	CTS (in)
4	RX (out)	8	Chassis GND

RJ45 RS-485 Port			
Pin	Function	Pin	Function
1	RX - (in -)	5	No Connection
2	RX + (in +)	6	TX - (out -)
3	TX + (out +)	7	No Connection
4	No Connection	8	GND

5-pin Screw Terminal RS-485 Port		
Pin	MSTD-0 (Old Function)	MSTD-1,2,3, (New Function)
1	GND	Signal GND
2	TX - (out -)	RTS (out)
3	TX + (out +)	CTS (in)
4	RX - (in -)	Chassis GND
5	RX + (in +)	GND

"... supports any Momentum I/O base, auto-detects the base ID code and reports this to 4x register 204."

5-pin Screw Terminal RS-232 Port	
Pin	Function
1	TX
2	RX
3	Signal GND
4	RTS
5	CTS

3-pin Screw Terminal RS-485 Port	
Pin	Function
1	GND
2	-
3	+

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Ordering Information

The MST is available in the following configurations:

MST L - n pp

Type

D = RS-485
S = RS-232

Connector

1 = RJ45
2 = 5 position removable terminal block
3 = 3 position removable terminal block

Protocol

01 = Modbus RTU, 9600 bps
02 = Modbus ASCII, 9600 bps
03 = Modbus RTU, 19200 bps
04 = Modbus ASCII, 19200 bps, protocol custom for G3 I/O bus
05 = PLogic/PNIM/RNIM, 9600 bps
06 = KYZ counter, Modbus RTU, 9600 bps
07 = KYZ counter, Modbus RTU, 19200 bps
08 = Modbus ASCII, 7 data bits, 9600 bps
09 = Character terminal, 9600 baud, no parity

"... other protocols will be added as the need arises."

Specifications

Dimensions	4.9" wide x 2.5" tall x 1.2" deep (124 x 64 x 30 mm). Approximately 2 ounces (56g) net. Durable polycarbonate enclosure.
Power Requirements	From TSX Momentum I/O base. 5VDC, 50mA max.
Serial Port	Single RS-232 or RS-485. Select protocol, baud rate and connector type by part number (see Ordering Information).
Indicators	Green LED Power indicator; amber LED indicators for Transmit and Receive. Three total indicators.
Configuration Registers	Stored in EEPROM; returned to factory defaults by setting device address to zero and cycling module power.
Statistics	Module health, last communication error, error count.
Operating Conditions	0 to 50 degrees C operating temperature; -40 to 80 degrees C storage. Humidity up to 90% noncondensing. Pressure altitude -200 to +10,000 feet MSL.

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