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Figure 2-3 — Modbus Serial Interface Interconnections

## 2.6 MODBUS SI FTA EIA-422/485 INTERFACE

The Serial Interface FTA EIA-422/485 (RS-422/485) is provided by a 5-pin compression terminal connector, J3 on the FTA (as shown in Figure 2-2). Signal and ground assignments are listed in Table 2-3. The following guidelines apply for the interface:

- Up to 15 devices can be connected to the EIA-422/485 interface.
- The interface must be no longer than 305 meters (1000 feet). However, the length can be expanded up to 1220 meters (4000 feet) with appropriate cable. Consult with your Honeywell representative for the recommended cable.
- To avoid potential ground loops, the signal cable shield must be connected to the Shield (SHD) pin only at the FTA end of the cable (see Figure 2-4).
- To minimize signal reflections, a 120 ohm 1/2 watt resistor should be connected between pins 1 and 5. The **Data +** and **Data –** signals should be similarly terminated with a 120 ohm resistor on the device at the extreme end of the cable. Figure 2-4 illustrates the method of terminating the EIA-422/485 interface.
- Two 1/4 A fuses, F1 and F2, protect the FTA from excessive current on the data lines. See the Serial Device Interface FTA layout illustration, Figure 2-2.

**Table 2-3 — J3 – Serial Interface FTA EIA-422/485 Interface**

Connector Pin	Description
1	R (Data +)
2	Data +
3	Shield
4	Data –
5	R (Data –)

### NOTE

The EIA-422/485 interface can be configured as a multidrop interface in which several peripheral devices can be connected. Refer to Figure 2-4 for important connection details.

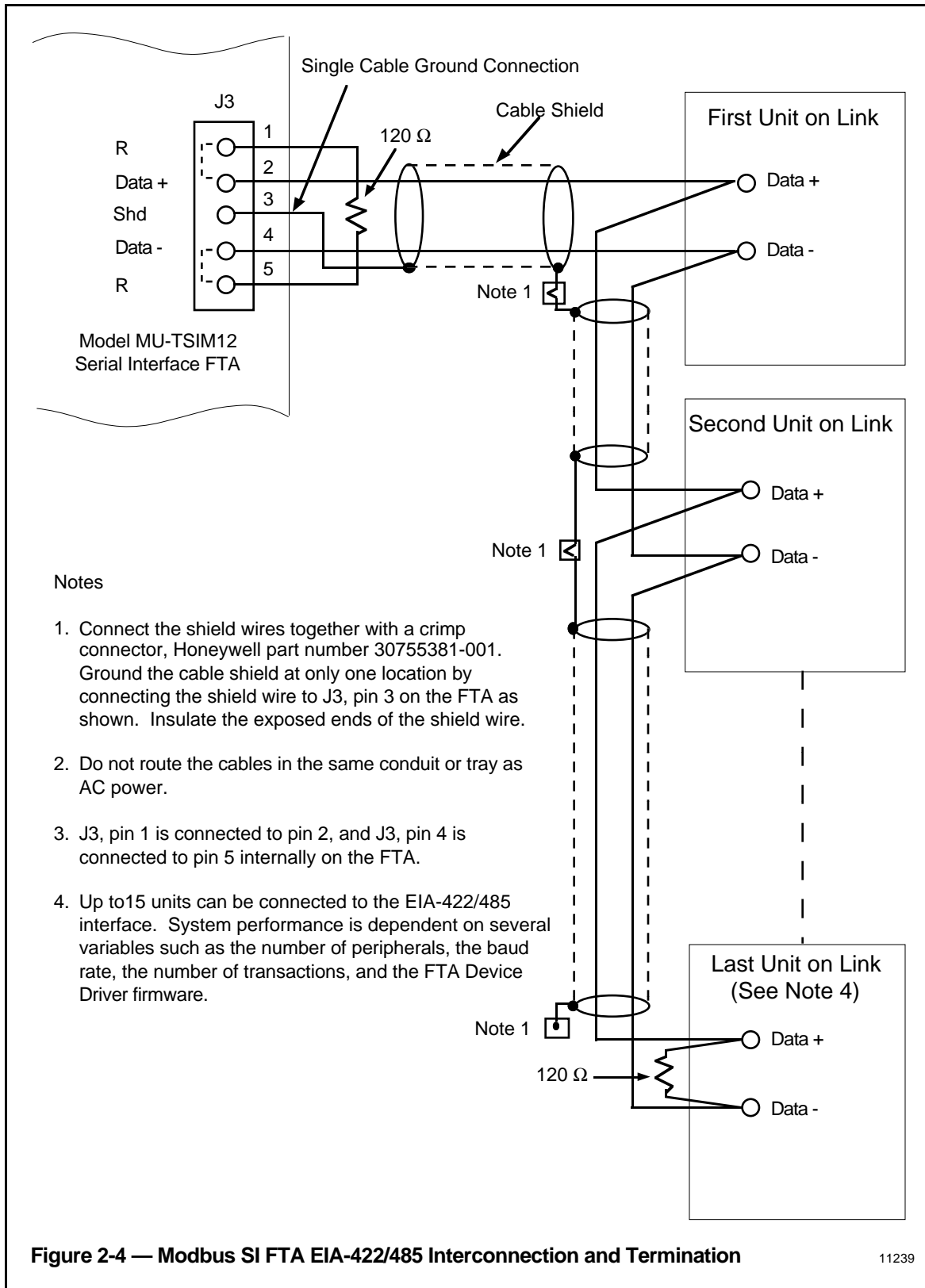


Figure 2-4 — Modbus SI FTA EIA-422/485 Interconnection and Termination

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## SPECIFICATIONS Section 4

*This section defines the I/O specifications for external serial interface devices that connect to the A PM or HPM Array Point's Serial Device Interface.*

### 4.1 SERIAL INTERFACE ARRAY POINT

<b>APM/HPM SI Array point capacity:</b>	80 SI Array Points/APM/HPM @ 1 second rate (40 @ 1/2 sec; 20 @ 1/4 sec)
<b>FTA point capacity:</b>	Up to 16 Array Points per SI FTA
<b>IOP point capacity:</b>	Up to 32 Array Points per SI IOP (2 FTAs)
<b>Data capacity per Array point:</b>  (contiguous data in PLC)	512 Flags (Booleans/coils), or  64 Numerics (8-bit integers), or 32 Numerics (Integers), or 16 Numerics (Reals), or 1 String of 64 characters, or 2 String of 32 characters, or 4 String of 16 characters, or 8 String of 8 characters
<b>Performance Guidelines:</b> Read and write performance is sensitive to a number of variables, including: the PLC type, scan time, message response time, PLC network configuration and traffic, amount of data access from other devices, and the overall health of the PLC network. For best results, a direct PLC connection is recommended.	<p><b>Reads per Port*:</b> Up to 2048 Booleans/second, or up to 128 Integers/second, or up to 64 Reals/second, or up to 4, 64-character strings; or weighted combinations of the above</p> <p><b>Writes per Port*:</b> 10 points/second</p>

#### NOTE

**\*These are guidelines only, and do not represent best performance figures.  
Read performance degrades with increased writes.**

## 4.2 MODBUS SERIAL INTERFACE

### 4.2.1 MODBUS Serial Interface Model Numbers

<b>SI FTA Model Number:</b>	MU-TSIM12
<b>SI IOP Model Number:</b>	MU-PSIM11
<b>Power Adapter FTA Model Number:</b>	MU-TLPA02

### 4.2.2 MODBUS Serial Interface Specifications

<b>Interface Type:</b>	EIA-232-D or EIA-485
<b>Number of Serial Channels:</b>	2 per IOP, 1 per FTA
<b>Distance – Power Adapter to FTA:</b>	300 m
<b>Protocol:</b>	Modbus
<b>Transmission Mode:</b>	RTU
<b>Serial Line Mode:</b>	RS232 or RS485
<b>Selectable Baud Rates:</b>	1200, 2400, 4800, 9600, 19,200 bps
<b>Serial Data Format:</b>	8 data bits with programmable 9th bit (parity)
<b>Selectable Parity:</b>	None, odd, or even
<b>Common Mode Operation:</b>	250 V rms (continuous)
<b>Surge Protection:</b>	IEEE SWC 472-1974
<b>ESD Protection:</b>	IEEE 801.2
<b>Number of Stop Bits:</b>	1
<b>Modem Control Support:</b>	Selectable On/Off
<b>Keep Alive Cell Write:</b>	Configurable address
<b>Message Response Timeout Time:</b>	Configurable timeout
<b>Exception Errors Reported:</b>	Keep Alive, Message Response Timeout, Signaling Mode/Modem
<b>Data Formats Supported:</b>	Support, Baud Rate, Parity Boolean, Real, ASCII Strings, Signed Integers, Unsigned Integers
<b>Inter-Message Stall Time:</b>	3.5 Character Time minimum

#### EIA-232-D SUPPORT

<b>Interface Type:</b>	Serial asynchronous
<b>Lines Supported:</b>	TXD, RXD, RTS, CTS, DSR, DTR, (Compatible with CCIT V.24; CCIT V.28)
<b>Distance – FTA to Device:</b>	15 meters (cable cap. = 2500 pF max.)

#### EIA-485 SUPPORT

<b>Interface Type:</b>	Serial asynchronous Half Duplex only
<b>Lines Supported:</b>	Two wire, differential pair: DATA+, DATA-, Protective GND (shield)
<b>Number of Transceivers:</b>	15 drops maximum
<b>Distance – FTA to Device:</b>	1.2 Km (4000 ft) max.