

# ***PLC Driver Manual***

## ***2800 & 2900***

### ***Compact Operator Interface Terminals with PLC communication drivers***

DM2829\_PLC Revision 2

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Other documents relative to the 2800 & 2900 are:

- 2800 Hardware Manual, HM2800
- 2900 Hardware Manual, HM2900
- 2800/2900 ASCII Driver Manual, DM2829\_ASCII
- 2800 Product Manual, AB Ultra 100, PM2800ABU

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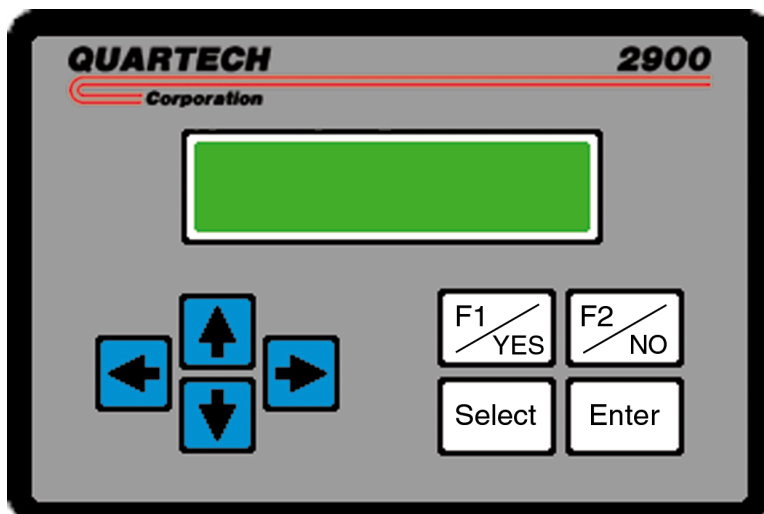
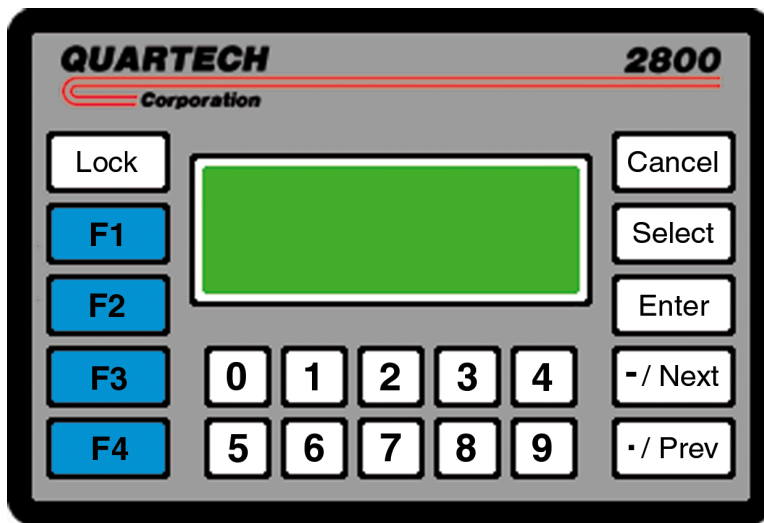
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The 2800 and 2900 Operator Interface Terminals (OIT) share a common software package, a common panel cutout and have a near identical list of communication drivers. This manual provides important information necessary for connecting either unit to a particular brand or model of Programmable Controller.



## PLC Communication Drivers

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## Allen-Bradley PLC-5 DF1

The PLC-5 DF1 interface uses RS-232 signal levels and is intended for point to point communications, i.e., only a single peripheral device may be connected to the DF1 port.

**ScreenMaker 2000 Port setup:** Baud rate: 9600 bps or 19200 bps  
 Interface type: RS-232 or RS-485  
 A single Dialogue File address is assigned and must be an Integer type file.  
 Element 0 is the Command Word.  
 Element 1 is Screen Trigger one.  
 Element 2 is Screen Trigger two.

**Byte format:** 8 data bits, 1 stop bit, no parity

### PLC-5 processor configuration

Use Allen-Bradley programming software to configure the PLC-5 processor as shown below.  
 The baud rate may be 9600bps as long as it matches the OIT setting.

<b>System Mode (DF1 Point to Point) Channel 0 Configuration</b>			
Diag. file:	0	System mode char.:	S
Remote mode change:	DISABLED	User mode char.:	U
Mode attention char.:	\0x1b	Baud Rate:	19200
		Parity:	NONE
Baud Rate:	19200	Stop bits:	1
Stop bits:	1	Control line:	NO HANDSHAKING
Control line:	NO HANDSHAKING	Duplicate Detect:	OFF
		Error Detect:	CRC
Duplicate Detect:	OFF	ACK Timeout (20 ms):	500
ACK Timeout (20 ms):	500	NAK Retries:	3
		ENQ Retries:	3

The following schematic shows the cable connections required between the OIT and the PLC-5 DF1 port. This cable is available from Quartech in a standard length of ten feet. Cables up to fifty feet in length may be ordered.

### Allen-Bradley PLC-5 DF1 Quartech Part Number: 2139-10

<b>PLC-5</b>		<b>2800/2900</b>	
25 Pin Male D-Type		15 Pin Female D-Type	
<b>RXD</b>	3 <))))))))))))))))))<	<b>TXD</b>	2
<b>TXD</b>	2 <))))))))))))))))))<	<b>RXD</b>	3
<b>SC</b>	7 <))))))))))))))))))<	<b>SC</b>	7
<b>RTS</b>	4 <)), +))))<	<b>RTS</b>	4
<b>CTS</b>	5 <)) - .))))<	<b>CTS</b>	5
<b>DSR</b>	6 <)), <b>Drain Wire</b> ))))<	<b>FG</b>	1
<b>DCD</b>	8 <)) 1		
<b>DTR</b>	20 <)) -		

## Allen-Bradley SLC500 DF1

The SLC500 DF1 interface uses RS-232 signal levels and is intended for point to point communications, i.e., only a single peripheral device may be connected to the DF1 port.

**ScreenMaker 2000 Port setup:** Baud rate: 9600 bps or 19200 bps  
 Interface type: RS-232 or RS-485  
 A single Dialogue File address is assigned and must be an Integer type file.  
 Element 0 is the Command Word.  
 Element 1 is Screen Trigger one.  
 Element 2 is Screen Trigger two.

**Byte format:** 8 data bits, 1 stop bit, no parity

### SLC500 processor configuration

Use Allen-Bradley programming software to configure the SLC500 processor as shown below.  
 The baud rate may be 9600bps as long as it matches the OIT setting.

<b>System Mode Channel 0 Configuration</b>			
Baud Rate:	19200	Parity:	NONE
Duplicate Detect:	DISABLED	Error Detect:	CRC
ACK Timeout [x20 ms]:	500	NAK Retries:	3
		ENQ Retries:	3
Control Line:	NO HANDSHAKING	Embedded Response:	ENABLED

The following schematic shows the cable connections required between the OIT and the SLC500 DF1 port. This cable is available from Quartech in a standard length of ten feet. Cables up to fifty feet in length may be ordered.

### Allen-Bradley SLC500 DF1

Quartech Part Number: 2136-10

<b>SLC500</b>		<b>2800/2900</b>	
9 Pin Female D-Type		15 Pin Female D-Type	
<b>RXD</b>	2 >))))))))))))))))))<	<b>TXD</b>	2
<b>TXD</b>	3 >))))))))))))))))))<	<b>RXD</b>	3
<b>SC</b>	5 >))))))))))))))))))<	<b>SC</b>	7
<b>RTS</b>	7 >)), +)))))<	<b>RTS</b>	4
<b>CTS</b>	8 >)) - .)))))<	<b>CTS</b>	5
<b>DCD</b>	1 >)), <b>Drain Wire</b> ))))<	<b>FG</b>	1
<b>DTR</b>	4 >)) 1		
<b>DSR</b>	6 >)) -		

**Allen-Bradley MicroLogix**  
 Quartech Part Number: 2147-01

<b>MicroLogic Cable</b> 9 Pin Male D-Type		<b>2800/2900</b> 15 Pin Female D-Type
<b>RXD</b> 3	<))))))))))))))))))<	<b>TXD</b> 2
<b>TXD</b> 2	<))))))))))))))))))<	<b>RXD</b> 3
<b>SC</b> 5	<))))))))))))))))))<	<b>SC</b> 7
	+))))<	<b>RTS</b> 4
	.))))<	<b>CTS</b> 5
	<b>Drain Wire</b> ))))<	<b>FG</b> 1

**Allen-Bradley DH485 Interface**

The SLC500 DH-485 interface uses RS-485 signal levels. The OIT can communicate on the DH485 network along with other Quartech products, programmers, and any other devices that strictly follows the DH485 protocol. The OIT must be assigned to a host PLC which is the PLC that its Dialogue File is located in. The OIT can also display data from other PLCs within the network.

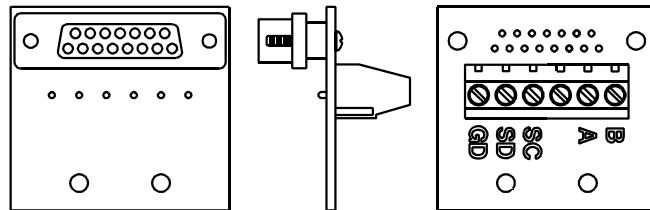
**ScreenMaker 2000 port setup:**

Baud rate: 9600 bps or 19200 bps  
 PLC Node: 0-31, OIT Node: 0-31, OIT Max poll address  
 A single Dialogue File address is assigned and must be an Integer type file.  
 Element 0 is the Command Word.  
 Element 1 is Screen Trigger one.  
 Element 2 is Screen Trigger two.

**Byte format:** 8 data bits, 1 stop bit, even parity

When connecting multiple devices on the network an Allen-Bradley 1747-AIC Isolated Link Coupler should be used between the SLC500 processor and the physical network. The OIT is connected to the network through the Quartech 9108 Network Link Adapter.

**Model 9108  
 Network Link Adapter**



When connecting a single OIT to a SLC500 processor a direct connection through the eight pin phone jack on the front of the processor may be preferable. The schematic on the next page shows the cable connections required between the OIT and the SLC500 DH485 port. This cable is available from Quartech in a standard length of ten feet. Cables up to one hundred feet in length may be ordered.

**Allen-Bradley SLC500 DH485**  
 Quatech Part Number: 2145-10

<b>SLC500</b>		<b>2800/2900</b>	
8 Pin RJ45		15 Pin Female D-Type	
<b>RxTxB</b>	1 (<))))))))))))))<	<b>RxTxB</b>	12
<b>RxTxA</b>	2 (<))))))))))))))<	<b>RxTxA</b>	13
<b>SC</b>	7 (<))))))))))))))<	<b>SC</b>	7
<b>Send/Rec</b>	5 (<))))))))))))))<	<b>Send/Rec</b>	8
		+))))<	4
		.))))<	5
	<b>Drain Wire))&lt;</b>	<b>FG</b>	1

### DH485 Network Basics

The DH485 Data Link network uses a multiple master, token passing protocol. For this protocol, the devices on the network form a logical ring; that is, the devices assume an ordered sequence, with the last device in the sequence followed by the first. Each device knows the node address of the device following it (its successor). The physical ordering of the devices on the network is irrelevant and independent of the logical ordering.

Each device on the network has the responsibility of periodically granting an opportunity for new devices to enter the network. Any time there exists a gap between a given device address and its successor's address, that device must periodically issue a "solicit successor" message to each potential node address between itself and its successor. The solicit successor message allows an opportunity for a new device to enter the network.

A total of 32 devices may share the DH485 Data Link network. When only a few devices are sharing the network the soliciting time can become considerable. To reduce unnecessary soliciting, a maximum poll address may be assigned in the OIT and most other devices designed for use on the network. The OIT, and other devices utilizing this feature, will send a "solicit successor" message only to those device addresses that are in the gap between itself and its successor, and have an address less than or equal to its maximum poll address. Use of the maximum poll address can relieve the device with the highest node address from the burden of soliciting a large number of unused node addresses.

### Choosing Device Node Addresses

It is imperative that each device on the network is assigned a unique node address. For best performance start node addresses at zero and increase sequentially, with no gaps between successive addresses. It is not important which device is assigned which address. The device with the highest address on the network should have its maximum poll address set equal to its own address.

**For example:** A DH485 network might include one SLC500, one programmer, and one OIT. Assigned node addresses could be as shown below.

- ▶ OIT node address = 00
- ▶ Programmer node address = 01
- ▶ SLC500 node address = 02. Max. poll address = 02.

The network described on the previous page was set up for best performance. Sometimes it is desirable to leave gaps between devices addresses so that other devices can be easily added after the data link has been initialized. This is acceptable, however, it will result in a reduction of performance since some device will have to issue a solicit successor message to each unused address in the gap. If a gap is left it should be as small as possible to reduce the link initialization time. A gap of even one address will reduce network performance.

## Transmission Lines

The DH485 Data Link network is designed to be wired in a point-to-point fashion. All devices are wired in-line, one after another, forming a single trunk line. Drop lines off the main trunk line are not recommended and may degrade or prevent network operation. As the trunk line length increases two factors become increasingly important. These factors are line resistance and line capacitance. In most applications the use of line terminating resistors will improve or allow satisfactory performance. Two terminating resistors are required for a network regardless of the number of devices in the network. One terminating resistor is connected at each end of the network. The OIT includes a terminating resistor that is switched into the circuit by closing a DIP switch accessible through the cover. Refer to the Hardware Manual for the particular OIT to identify which DIP switch is assigned. If the OIT is at either end of the network the switch should be closed. Devices which are not at either physical end of the network must not have termination resistor switched into the circuit.

## Allen-Bradley PLC-2

The PLC-2 interface is intended for point to point communications, i.e., only a single peripheral device may be connected to the PLC-2 port. However, Quartech does manufacture a port expander (Model 8516) that will allow up to four devices to talk to a single PLC-2 processor.

ScreenMaker 2000 Port setup:      Baud rate: 9600 bps  
Byte format: 8 data bits, 1 stop bit, Even parity  
A single Dialogue File address is assigned. This is the address of the Command Word. The two contiguous word addresses following are also required. The last digit of the address can not be a six or seven.  
> Specified Word Address is the Command Word.  
> Specified Word Address plus one is Screen Trigger one.  
> Specified Word Address plus two is Screen Trigger two.

The following schematic shows the cable connections required between the OIT and the PLC-2 port. This cable is available from Quartech in a standard length of ten feet. Cables up to fifty feet in length may be ordered.

### Allen-Bradley PLC-2

Quartech Part Number: 2157-10

<b>PLC-2</b>	<b>2800/2900</b>
15 Pin Male D-Type	15 Pin Female D-Type
RXDB 1 <)))))))))))))))))) <	14 TXDB
RXDA 2 <)))))))))))))))))) <	6 TXDA
CTSB 3 >)))))))))))))))))) <	15 RTSB
CTSA 4 <)))))))))))))))))) <	11 RTSA
TXDB 5 <)))))))))))))))))) <	12 RXDB
TXDA 6 <)))))))))))))))))) <	13 RXDA
	+)))) < 4 RTS
	.)))) < 5 CTS

## Fuji Electric N Series

The N Series PLC interface uses RS-485 signal levels and is intended for point to point communications, i.e., only a single peripheral device may be connected to the PLC port.

**ScreenMaker 2000 Port setup:** Command Word Address: Internal Bits (M Type), one word  
Screen Trigger Address: Data Register (D Type), two contiguous words

**Communication format:** 8 data bits, 1 stop bit, odd parity, 19200bps.

The following schematic shows the cable connections required between the OIT and the N Series PLC port. This cable is available from Quartech in a standard length of ten feet. Cables up to two hundred feet in length may be ordered.

### Fuji Electric N Series

Quartech Part Number: 2152-10

<b>N Series</b>		<b>2800/2900</b>		
8 Pin RJ485		15 Pin Female D-Type		
<b>TXD+</b>	<b>3</b>	<))))))))))))))))))<	<b>12</b>	<b>RXDB</b>
<b>TXD-</b>	<b>4</b>	<))))))))))))))))))<	<b>13</b>	<b>RXDA</b>
<b>RXD+</b>	<b>5</b>	<))))))))))))))))))<	<b>14</b>	<b>TXDB</b>
<b>RXD-</b>	<b>6</b>	<))))))))))))))))))<	<b>6</b>	<b>TXDA</b>
<b>SC</b>	<b>8</b>	<))))))))))))))))))<	<b>7</b>	<b>SC</b>
		+))))<	<b>4</b>	<b>RTS</b>
		.))))<	<b>5</b>	<b>CTS</b>
		<b>Drain Wire</b> ))))<	<b>1</b>	<b>FG</b>



## GE Fanuc Series Ninety

The Series Ninety PLC interface uses RS-485 signal levels. Although a single master, multiple slave network is possible the OIT does not support it.

**ScreenMaker 2000 Port setup:** Baud rate: 9600 bps or 19200 bps  
 Command Word Address: Internal Relay (%M Type), one word  
 Screen Trigger Address: Data Register (%R Type), two contiguous words

**Byte format:** 8 data bits, 1 stop bit, odd parity

The following schematic shows the cable connections required between the OIT and the SNP port. This cable is available from Quartech in a standard length of ten feet. Cables up to two hundred feet in length may be ordered.

### GE Fanuc Series 90 Quartech Part Number: 2150-10

<b>Series 90</b>		<b>2800/2900</b>	
15 Pin Male D-Type		15 Pin Female D-Type	
<b>SDB</b>	<b>13</b> <))))))))))))))))))<	<b>12</b>	<b>RXDB</b>
<b>SDA</b>	<b>12</b> <))))))))))))))))))<	<b>13</b>	<b>RXDA</b>
<b>RDB</b>	<b>11</b> <))))))))))))))))))<	<b>14</b>	<b>TXDB</b>
<b>RDA</b>	<b>10</b> <)))0))))))))))))))<	<b>6</b>	<b>TXDA</b>
	<b>9</b> <))) -		
<b>SC</b>	<b>7</b> <))))))))))))))))))<	<b>7</b>	<b>SC</b>
<b>CTSB</b>	<b>8</b> <))) ,	<b>+))))&lt;</b>	<b>4</b>
<b>RTSB</b>	<b>14</b> <))) -	<b>.))))&lt;</b>	<b>5</b>
<b>CTSA</b>	<b>6</b> <))) ,		
<b>RTSA</b>	<b>15</b> <))) -		
<b>FG</b>	<b>1</b> <))) <b>Drain Wire</b>		

## Idec Micro 3 Series

The Micro 3 Series PLC interface varies based on the model. Also both point to point communications and network communications are available.

**ScreenMaker 2000 Port setup:** PLC Type: Micro 3 RS-485, Micro 3C RS-232, Data Link RS-485  
 Host PLC node address: 0 through 1F hexadecimal  
 Command Word Address: Internal Relay (M Type), one word  
 Screen Trigger Address: Data Register (D Type), two contiguous words

**Communication format:** 7 data bits, 1 stop bit, even parity, 9600 bps.

The following schematics show cable connections required between the OIT and the various Micro 3 ports. Both cables are available from Quartech in a standard length of ten feet. 2154 cables up to two hundred feet in length may be ordered. 2155 cables up to fifty feet in length may be ordered.

### Idec Micro 3C

Quartech Part Number: 2154-10

	<b>Micro 3C</b> 8 Pin Mini DIN		<b>2800/2900</b> 15 Pin Female D-Type
<b>RXD</b>	<b>4</b> <)))))))))))))))))) <	<b>2</b>	<b>TXD</b>
<b>TXD</b>	<b>3</b> <)))))))))))))))))) <	<b>3</b>	<b>RXD</b>
<b>SC</b>	<b>6</b> <))))))))))0)))))) <	<b>7</b>	<b>SC</b>
<b>SC</b>	<b>7</b> <)))))))))) - +)))) <	<b>4</b>	<b>RTS</b>
		<b>5</b>	<b>CTS</b>
	<b>Drain Wire</b> )))) <	<b>1</b>	<b>FG</b>

### Idec Micro 3

Quartech Part Number: 2155-10

	<b>Micro 3</b> 8 Pin Mini DIN		<b>2800/2900</b> 15 Pin Female D-Type
<b>RxTxA</b>	<b>2</b> <)))))))))))))))))) <	<b>13</b>	<b>RxTxA</b>
<b>TxTxB</b>	<b>1</b> <)))))))))))))))))) <	<b>12</b>	<b>RxTxB</b>
<b>SC</b>	<b>7</b> <)))))))))))))))))) <	<b>7</b>	<b>SC</b>
		<b>4</b>	<b>RTS</b>
		<b>5</b>	<b>CTS</b>
	<b>Drain Wire</b> )))) <	<b>1</b>	<b>FG</b>



The FX Series interface uses signal levels is intended point to point communications, i.e., only a single peripheral device may be connected to the FX port.

Command Word Address: Internal Coil (M Type), one word  
 Screen Trigger Address: Data Register (D Type), two contiguous words

7 data bits, 1 stop bit, even parity, 9600bps.

The following shows the connections required the OIT the FX port. This is

**Mitsubishi FX Series**  
 Quartech Part Number: 2148-10

<b>FX Series</b>		<b>2800/2900</b>	
25 Pin Male D-Type		15 Pin Female D-Type	
<b>TX+</b>	3 <))))))))))))))))))<	<b>12</b>	<b>RXDB</b>
<b>TX-</b>	16 <))))))))))))))))))<	<b>13</b>	
<b>RX+</b>	2 ))))))))))))))))<		<b>TXDB</b>
<b>RX-</b>	<))))))))))))))))))<	<b>6</b>	<b>TXDA</b>
<b>SC</b>	8 <))))))))))))))))))<	<b>7</b>	
<b>DCC</b>	20 ))) ,	+))))	<b>RTS</b>
<b>PWE</b>	<))) -	.)))))<	<b>CTS</b>
	4 <))) ,	<b>Drain Wire</b> ))))<	<b>1</b>
<b>DCC</b>	7 ))) -		
	17 <))) ,		
<b>+5VDC</b>	24 ))) -		

## Modicon MODBUS

The Modbus PLC interface uses RS-232 signal levels and is intended for point to point communications, i.e., only a single peripheral device may be connected to the MODBUS port.

**ScreenMaker 2000 Port setup:** Baud rate: 9600 bps or 19200 bps  
 PLC Address: 1 through 247  
 Interface type: RS-232 or RS-485  
 Command Word Address: Output Coil (0xxxx), one word  
 Screen Trigger Address: Output Register (4xxxx), two contiguous words

**Byte format:** 8 data bits, 1 stop bit, even parity, RTU protocol.

The following schematic shows the cable connections required between the OIT and various MODBUS ports. These cables are available from Quartech in a standard length of ten feet. Cables up to fifty feet in length may be ordered.

### Modicon Modbus 984 Quartech Part Number: 2116-10

<b>Modbus 984</b>		<b>2800/2900</b>	
9 Pin Male D-Type		15 Pin Female D-Type	
RXD	2 <)))))))))))))))))) < 2	TXD	
TXD	3 <)))))))))))))))))) < 3	RXD	
SC	5 <)))))))))))))))))) < 7	SC	
DTR	4 <)), , +)))) < 4	RTS	
DSR	6 <)))- .)))) < 5	CTS	
RTS	7 <)), <b>Drain Wire</b> ))) < 1	FG	
CTS	8 <)))-		

### Modicon Micro Quartech Part Number: 2151-10

<b>Micro</b>		<b>2800/2900</b>	
8 Pin RJ485		15 Pin Female D-Type	
RXD	4 <)))))))))))))))))) < 2	TXD	
TXD	3 <)))))))))))))))))) < 3	RXD	
SC	5 <)))))))))))))))))) < 7	SC	
RTS	6 <)), , +)))) < 4	RTS	
CTS	7 <)))- .)))) < 5	CTS	
	<b>Drain Wire</b> ))) < 1	FG	

## NOTES:

Up to four OITs can be connected to a single Modbus port using the Quartech Model 8517 Multiplexer

## Omron Host Link

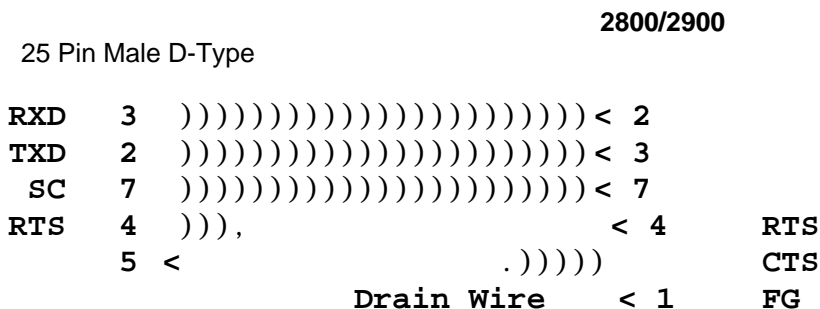
Host Link uses RS-232 RS-422 signal The RS-232 port is intended for point to point be connected to the port. A single master, multiple slave

**ScreenMaker 2000 Port setup:** Interface type: RS-232 or RS-422  
 Baud rate: 9600 bps or 19200 bps  
 Command Word Address: Internal Bits (HR Type), one word

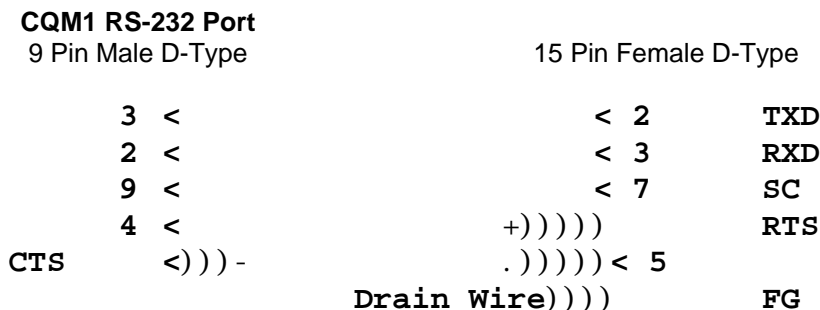
**Byte format:** 7 data bits, 2 stop bit, even parity

following schematic the cable required between OIT and LK201 Host port. This cable is available from Quartech in a standard length of ten feet. Cables up to fifty feet in length may be ordered.

### Omron Host Link Quartech Part Number: 2132-10



### Quartech Part Number: 2158-10



CQM1 lot number manufactured prior July, 1995 at 2400bps use one bit. These have or earlier. To allow the 2800 or 2900 to communicate with these processors set the node address

## Toshiba EX100

The Toshiba EX100 is a non standard interface intended for point to point communications, i.e., only a single peripheral device may be connected to the port. This driver is compatible with Toshiba models EX100, EX250, EX500, M20, and M40. It is also compatible with the Cutler-Hammer D500 processor.

**ScreenMaker 2000 Port setup:** Command Word Address: Internal Relays (RW Type), one word  
 Screen Trigger Address: Data Register (D Type), two contiguous words

**Interface type:** Custom, 4800 bps, 8 data bits, 1 stop bit, even parity.

The following schematic shows the cable connections required between the OIT and the Toshiba programming port. This cable is available from Quartech in a standard length of ten feet. Cables up to twenty five feet in length may be ordered.

**Toshiba EX100**  
 Quartech Part Number: 2159-0

<b>Toshiba Port</b>	<b>2800/2900</b>	
8 Pin Male Connector	15 Pin Female D-Type	
SC A4 <)))))))))))))))))) <	11	SC
RXD A3 <)))))))))))))))))) <	6	TXDA
TXD B3 <))))))))))))))))))0) <	13	RXDA
	+) Y 4.7K Z) -	
+5 B4 <))))))3)))))) <	15	+5
	.) Y 4.7K Z)0) <	RXDB
	+) Y 2.7K Z) -	
	.))))))) <	SC
	+))))) <	RTS
	.))))) <	CTS
	Drain Wire))))) <	FG

The T1 interface RS-232 or signal levels on the m configuration. single master slave network be configured using the RS-485 One PLC be as the meaning the Word and Triggers are in it. The OIT will be capable reading and data to PLCs on network. The and 2900 using the Computer

**ScreenMaker 2000 Port setup:** Interface type: RS-232 or RS-485  
 Baud rate: 9600 bps or 19200 bps  
 Byte format: 8 data bits, 1 stop bit, odd or no parity  
 Screen Trigger Address: Data Register (D Type), two contiguous words

This is available Quartech in standard length ten feet. up to feet in may be

**Toshiba T1**  
 Quartech Part Number: 2160-10

				<b>2800/2900</b>	
	8 Pin Male Mini DIN				
<b>RXD</b>	<b>8</b>	))))))))))))))))))	<	<b>2</b>	
<b>TXD</b>	<b>6</b>	))))))))))))))))))	<	<b>3</b>	
<b>SC</b>	<b>5</b>	))))))))))))))))))	<	<b>7</b>	
<b>RTS</b>	<b>4</b>	)),	<	<b>4</b>	<b>RTS</b>
	<b>7</b>	< .))))))			<b>CTS</b>
		<b>Drain Wire</b>	<	<b>1</b>	<b>FG</b>



## Yaskawa, MP930 Memobus Interface

The MP930 interface uses RS-232 signal levels and is intended for point to point communication, i.e., only a single peripheral device may be connected to the MP930 port. The OIT will be capable of reading and writing data to all MW and ML address locations. The 2800 and 2900 communicate using the T-Series Computer Link ASCII protocol.

**ScreenMaker 2000 Port setup:** Node address: 1 through 247  
 Baud rate: 9600 bps or 19200 bps  
 Command Word Address: (MW Type), one word  
 Screen Trigger Address: (MW Type), two contiguous words

**Byte format:** 8 data bits, 1 stop bit, even parity

The following schematic shows the cable connections required between the OIT and the MP930 port 2 . This cable is available from Quartech in a standard length of ten feet. Cables up to fifty feet in length may be ordered.

**Yaskawa MP930 Port 2**  
 Quartech Part Number: 2164-10

	<b>MP930 Port 2</b>		<b>2800/2900</b>
	9 Pin Male D-Type		15 Pin Female D-Type
<b>RXD</b>	<b>3</b> (<)))))))))))))) <	<b>2</b>	<b>TXD</b>
<b>TXD</b>	<b>2</b> (<)))))))))))))) <	<b>3</b>	<b>RXD</b>
<b>SC</b>	<b>7</b> (<)))))))))))))) <	<b>7</b>	<b>SC</b>
<b>RTS</b>	<b>4</b> (<)),	<b>4</b> (+)))) <	<b>RTS</b>
<b>CTS</b>	<b>5</b> (<))-	<b>5</b> (.)))) <	<b>CTS</b>
<b>DSR</b>	<b>6</b> (<)),		
<b>DTR</b>	<b>9</b> (<))-		

**NOTES:**

The OIT can directly address locations MW00000 through MW32767, and ML00000 through ML32767. Address type MB is accessed using the Bit Status Field or Bit Status function key designation.

Up to four OITs can be connected to a single MP930 port using the Quartech Model 8517 Multiplexer.