

RFL Technical Note

MA-427 LAN Bridge Module Adapter

This technical note introduces the features of the MA-427 LAN Bridge module adapter and provides information for its installation, operation, and troubleshooting.

Features

The MA-427 LAN Bridge module adapter (see Figure 1) provides a high performance, remote, self-learning Ethernet bridge. It is ideal for cost-sensitive bridging applications, or as a LAN extender or segmenter over bit stream type infrastructures for RFL data channel modules such as the DS-64NC.

The MA-427 LAN Bridge provides the following features:

- high performance Ethernet bridge/extender
- fully compatible with IEEE 802.3
- 10BaseT LAN interface with unshielded twisted pair (UTP) RJ-45
- support for full and half duplex Ethernet applications
- transparent simplex, half duplex, or full duplex support on the WAN interface
- WAN link rate of up to 10 Mbps sync or up to 115.2 kbps async
- switch-selectable filtering with 15,000 frames per second filtering and forwarding rate
- 256-frame buffer
- 10,000 MAC address LAN table
- automatic learning and aging of MAC addresses
- switch-selectable enhanced compression



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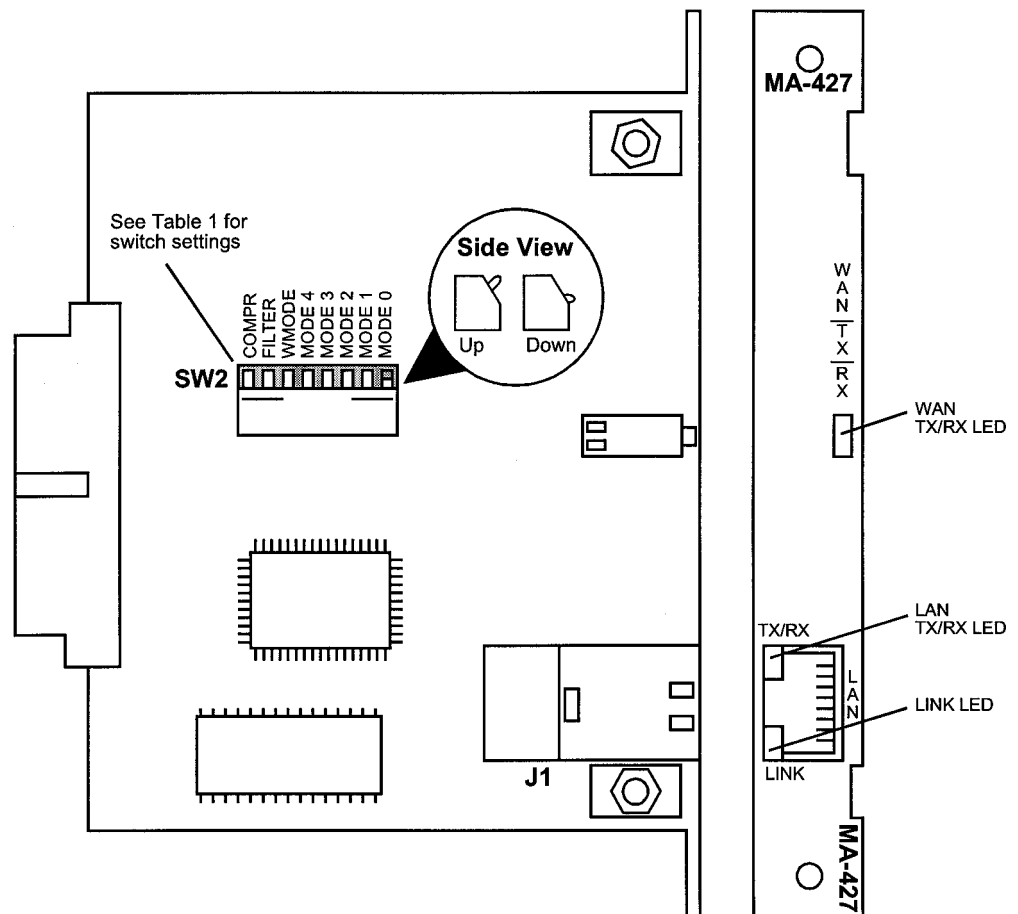
Installation and Operation

Installation comprises three parts: verify switch settings, connect the MA-427 LAN Bridge to your LAN, and verify LAN-to-LAN operation.

Verifying Switch Settings

Verify the MA-427 LAN Bridge's switches are set to the defaults described in Table 1. See Figure 1 to locate the switches on the board.

Figure 1 The MA-427 LAN Bridge Module Adapter



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Table 1 MA-427 LAN Bridge SW2 Settings

Switch	Default Settings	Switch Options
COMPR [†] (Compression)	Down	Down = Compression off Up = Compression on
FILTER [†]	Down	Down = Filter and forward (bridge) off Up = Filter and forward (bridge) on
WMODE (WAN)	Down ^{††}	Down = Synchronous Up = Asynchronous
MODE 4	Down [‡]	Future application
MODE 3	Down [‡]	
MODE 2	Down [‡]	
MODE 1	Down [‡]	
MODE 0	Up [‡]	

Note: † The compression and filter switch must each have the same setting as their corresponding switch on the far side of the network.

†† To ensure proper operation with the DS-64NC, do not change the WMODE switch from its default setting.

‡ To ensure proper operation, do not change the MODE 0-4 switches from their default settings.

Filtering

Over time the MA-427 LAN Bridge will automatically learn and store a table with up to 10,000 MAC addresses of devices on the WAN. When the filter is on, the MA-427 LAN Bridge will use the MAC address table to only allow frames destined for another LAN over the WAN. When the filter is off, all frames are sent over the WAN.



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Connecting the MA-427 LAN Bridge to Your LAN

You should connect the MA-427 LAN Bridge to a hub or Ethernet switch using a straight-through cable such as Black Box 10 ft. straight-through cable (P/N EVSA85-0010).

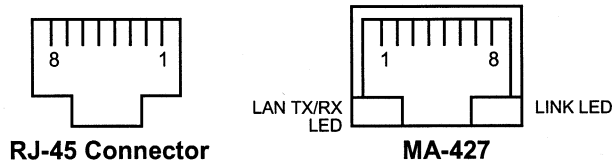
If you connect the MA-427 directly to a PC or a network interface card (NIC), the RJ-45 cable must implement a UTP crossover function, such as Black Box 10 ft. crossover cable (P/N EVCRA85-0010).

Table 2 provides information for both straight-through and crossover cable pin connections. Figure 2 shows the locations of Pins 1 and 8 on the RJ-45 connector and the MA-427.

Table 2 Straight-Through and Crossover RJ-45 UTP Cable Pin Connections

Straight-Through RJ-45 UTP Cable Pin Connections				Crossover RJ-45 UTP Cable Pin Connections			
MA-427		Hub or Ethernet switch		MA-427		PC or NIC	
Pin	Function	Pin	Function	Pin	Function	Pin	Function
1	TX+	1	TX+	1	TX+	3	RX+
2	TX-	2	TX-	2	TX-	6	RX-
3	RX+	3	RX+	3	RX+	1	TX+
4	Not Used	4	Not Used	4	Not Used	4	Not Used
5	Not Used	5	Not Used	5	Not Used	5	Not Used
6	RX-	6	RX-	6	RX-	2	TX-
7	Not Used	7	Not Used	7	Not Used	7	Not Used
8	Not Used	8	Not Used	8	Not Used	8	Not Used

Figure 2 Pins 1 and 8 on RJ-45 connector and on MA-427 LAN Bridge



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Verifying LAN-to-LAN Operation

Once you have completed the installation, verify that the MA-427 LAN Bridge is operating properly by checking LAN-to-LAN operation with your network administrator. You can also verify the operation of the MA-427 by checking its LEDs. Table 3 describes the LEDs and their state under normal operating conditions when connected to a functioning LAN.

Table 3 MA-427 LAN Bridge LEDs

LED	Color	State	Function	Normal State
WAN TX/RX	Yellow	On	Indicates transmission of data to or receiving data from the WAN	This LED will flash on and off when connected to a functioning LAN
		Off	Indicates no transmission of data to or receiving data from the WAN	
LAN TX/RX	Yellow	On	Indicates transmission of data to or receiving data from the LAN	This LED will flash on and off when connected to a functioning LAN
		Off	Indicates no transmission of data to or receiving data from the LAN	
LINK	Green	On	Indicates connection to LAN	This LED should always be on when connected to a functioning LAN
		Off	Indicates no connection to LAN	



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Troubleshooting

Use the table below to troubleshoot any problems you encounter during installation or operation of the MA-427 LAN Bridge.

Table 4 Troubleshooting Problems and Solutions for the MA-427 LAN Bridge

Problem	Probable Cause	Solution
LINK LED is not on	No LAN connection	<ul style="list-style-type: none"> Remove and reconnect the RJ-45 cable connector into the MA-427 port.
	Wrong cable for device connection	<ul style="list-style-type: none"> Check that proper cable is being used for connection. Use UTP RJ-45 for hub or Ethernet switch. Use UTP RJ-45 with crossover for PC or NIC. See Table 2 on page 4.
	Problem with LAN	<ul style="list-style-type: none"> See your network administrator.
	T1/E1 link is not working	<ul style="list-style-type: none"> Contact your T1/E1 service provider.
No LAN-to-LAN communication (data is not being sent or received)	No LAN connection	<ul style="list-style-type: none"> Verify that LINK LED is on. If it is not, see "LINK LED is not on" above.
	Incompatible switch settings	<ul style="list-style-type: none"> Verify the COMPR switch settings are the same on both ends of the network. Verify the FILTER switch settings are the same on both ends of the network. Verify that the WMODE and MODE 0-4 switches are set to their defaults. See Table 1 on page 3.
	Problem with LAN	<ul style="list-style-type: none"> See your network administrator.
	Synchronous data link is not working	<ul style="list-style-type: none"> Check the operation of the DS-64NC using the "Troubleshooting Procedure Using the Internal Test Pattern Generator" in section 4.1 of your DS-64NC manual.
WAN TX/RX LED and LAN TX/RX LED is always on	MODE 0 switch is in the DOWN position	<ul style="list-style-type: none"> Set MODE 0 switch into the UP position. See Figure 1 on page 2 for the switch's location.



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