

Setting the D2–DCM switches

The D2–DCM has two banks of dipswitches that allow you to select the communication parameters necessary for your application. In quite a few cases, you may not have to change the switches at all. The D2–DCM comes set from the factory for:

- **DirectNET** Slave operation
- 9600 Baud
- Station Address 1
- Odd Parity
- Hex Mode

Host Computer or Operator Interface Connection

If you're using a host computer or operator interface as the master station you should set the D2–DCM to match the master station parameters. Check the documentation that came with your computer or operator interface panel to determine the available communication parameters.

You'll need to know the following things.

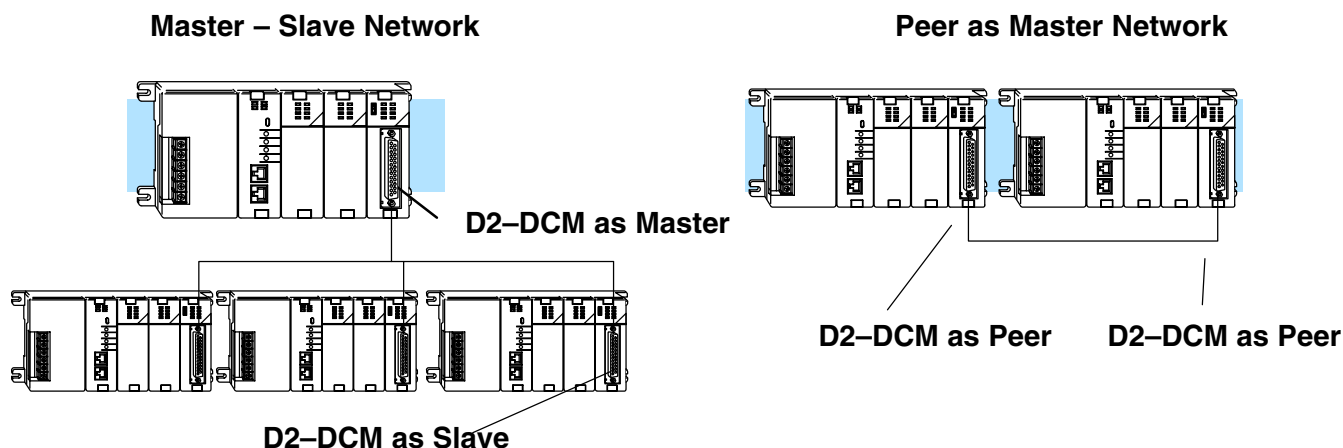
- Baud rate
- Parity settings
- Protocol required

Your operator interface must use one of the following protocols.

- **DirectNET**
- K-sequence
- Hostlink (**DirectNET** was called Hostlink on the old TI™ or Simatic® TI products. Some Operator Interface manufacturers may still refer to it this way.)
- MODBUS® RTU

DirectNET Interface Connection

If you're using the D2–DCM as a **DirectNET** interface, you'll need to know whether the D2–DCM is being used in a master station, slave station, or peer station. Once you've determined how the D2–DCM will be used, proceed with the dipswitch settings.



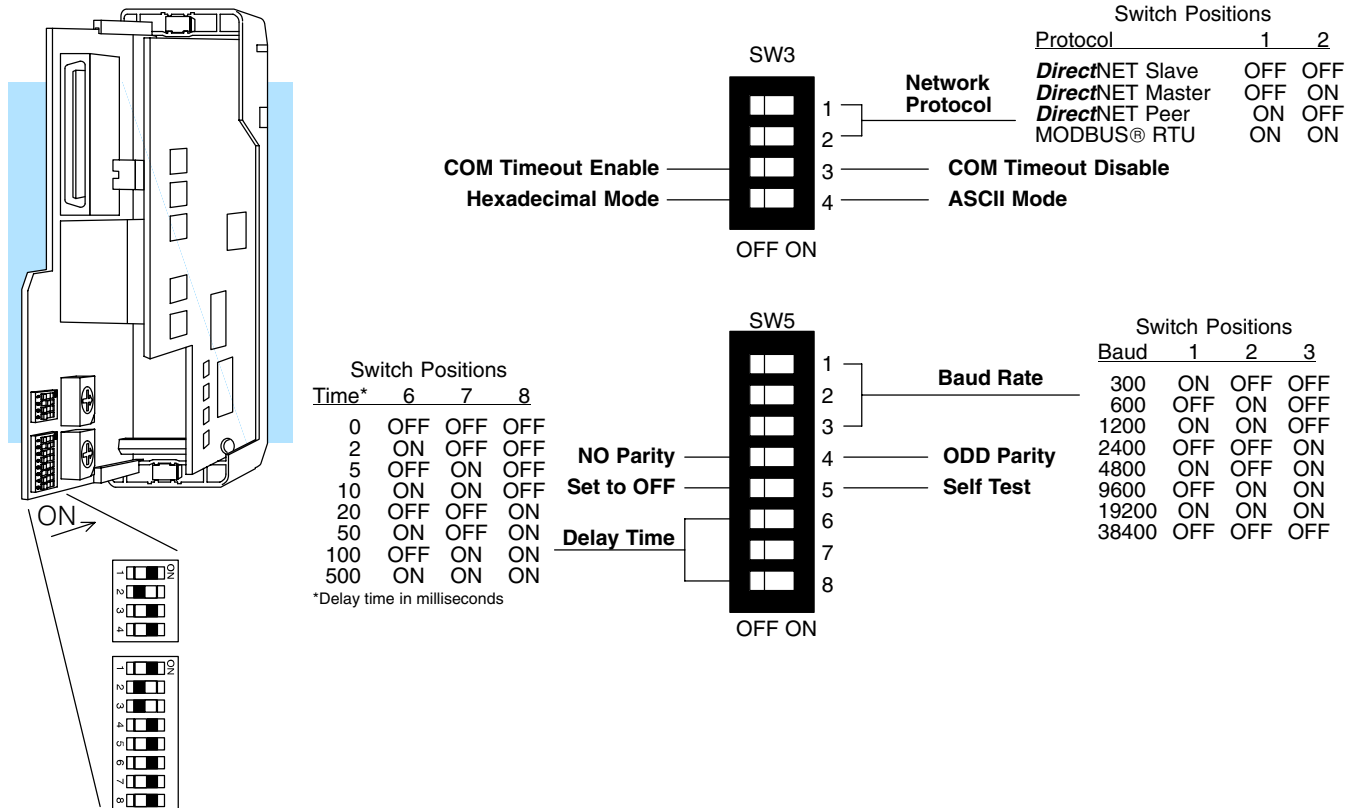
D2-DCM Switch Settings

Once again, the switches should be set at the factory for the following type of operation.

- **DirectNET** Slave
- 9600 Baud
- Station Address 1
- Odd Parity
- Hex Mode

If these settings are acceptable, then you can go ahead and install the D2-DCM into the base. If not, you'll have to change the switch settings.

There are two small banks of switches located next to the blue rotary switches on the one of the D2-DCM circuit boards. These dipswitches are used to select the communications settings. The following diagram shows the switch locations and their purpose.



Protocol Selection: Positions 1 and 2 on SW3 select the D2–DCM protocol and the master or slave settings. The D2–DCM primarily uses two protocols, **DirectNET** and MODBUS® RTU protocol. Here's some information to help you choose.

Communications Port for DirectSOFT32 Programming: If you plan to program the CPU through the D2–DCM, then you can use either **DirectNET** protocol or our proprietary protocol, called K-sequence. Although it is not listed in the switch settings, K-sequence is also available whenever the D2–DCM is set for **DirectNET** slave operation.

Computer or Operator Interface: If you're using the D2–DCM to connect a computer or operator interface, check your documentation to see which protocol is being used. Since the D2–DCM is always a slave station when it's connected to a computer or operator interface, you should select **DirectNET** slave or MODBUS® RTU slave. Note, there are also a handful of operator interfaces that have been designed to use our proprietary K-sequence protocol. If you have one of these, or if you need to use K-sequence for some reason, make sure you set the D2–DCM for **DirectNET** Slave operation. Peer to Peer works in Hexadecimal mode only.

DirectNET Master / Slave: In a **DirectNET** master / slave network, one D2–DCM should be set as a master and the rest should be set as slaves.

DirectNET Peer as Master: This is a variation of the master / slave protocol and should be selected when you only have two stations that can each initiate requests. Each station must have a D2–DCM as the network interface.

MODBUS® RTU Slave: The D2–DCM can also be a MODBUS® slave (in the RTU or HEX mode). The D2–DCM cannot be a MODBUS® master station. If you're going to use MODBUS®, make sure your software package supports the DL205 products. See Appendix C for more information.

Communication Timeout: Position 3 on SW3 selects the communication timeout. For most cases, you should leave this switch in the OFF position. Communication Timeout Disable is normally used *only* if you're developing your own **DirectNET** programs. By disabling the timeout, you can send one **DirectNET** component without any communication timeout problems. If you have this timeout disabled and a communication error does occur, you must restart communications by sending a retry or an End of Transmission (EOT) command. If you want to know more, see the **DirectNET** manual for details.

ASCII / HEX Mode: Position 4 on SW3 selects between ASCII and HEX modes of data representation. If you want the fastest communication possible, use HEX mode, which is the default. The difference is in the way the data is represented. The same data is twice as long in ASCII format, so if there's more data, it takes longer to transfer. If you have a device on the network that requires ASCII mode, then set the switch for ASCII mode, otherwise, use HEX mode.

Baud Rate: Positions 1 – 3 on SW5 are used to set the baud rate for the D2–DCM. There are eight baud rate selections available ranging from 300bps to 38.4Kbps. **All stations must have the same baud rate before the communications will operate correctly.** Usually, you should use the highest baud rate possible unless noise problems appear. If noise problems appear, try reducing the baud rates.

Parity: Position 4 on SW5 selects between the two parity options, odd or none. If you're using all DL205 equipment, you should use odd parity. Odd parity uses eleven bits total (1 start bit, 8 data bits, 1 stop bit, and 1 parity bit).

Some devices require no parity, which uses only 10 bits (1 start bit, 8 data bits, and 1 stop bit).

Self-Test: Position 5 on SW5 selects the factory self-test and should always be switched off. If the self-test is on, the module will not operate correctly.

Response Delay Time: Positions 6–8 on SW4 set the response delay time. The delay time specifies the amount of time the D2–DCM waits to send the data after it has raised the RTS signal line. This is normally set to 0, and is typically only adjusted if you are using the D2–DCM with a radio modem. If you are using the D2–DCM with a radio modem, check your modem documentation to help you choose the proper setting. Also, if you're considering the use of a modem, check out Appendix D. It may be of some help.

Address Selection Switch

The D2–DCM station address is set by the two rotary switches located on one of the D2–DCM's circuit boards. **Addresses are in hexadecimal format with valid addresses from 0 (only used for the master station) to hexadecimal 5A.** The addresses do not have to be consecutive, but each station must have a unique address.

The top rotary switch is used to set the most significant digit of the HEX address. The bottom switch is used to set the least significant digit of the HEX address. For example, to set a D2–DCM address of HEX 10 (decimal 16), set the top rotary switch to 1 and the bottom rotary switch to 0. If you're using the D2–DCM as a master, make sure you select address 0.

Even though the D2–DCM address is set in hexadecimal, it's a good idea to remember the decimal equivalent. This is because the decimal address is used most often. For example, a RLL communications program, the *DirectSOFT32* Programming Software, and our DSData Server all use the decimal equivalent of the HEX address. It's easy to convert from hex to decimal.

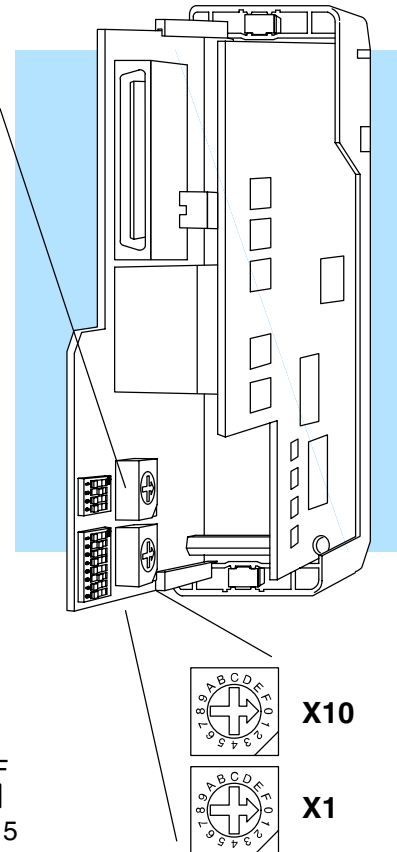
Example: Switches set for 3C

HEX Format

0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
										10	11	12	13	14	15

HEX 3C

$$3 \times 16 = 48 \quad + \quad C = 12 \quad = 60 \text{ decimal}$$



Warning: The D2–DCM address switch settings are only read at power up. If you want to change the address, you must remove the module from the base to access the switches. Your system can be damaged if you install or remove system components before disconnecting the system power. To minimize the risk of equipment damage, electrical shock, or personal injury, always disconnect the system power before installing or removing any system component.

Online / Offline Switch

On the front of the unit, just to the left of the LEDs, you'll notice a small slide switch. This switch is labeled ON (for online) and OFF (for offline). If you want to communicate through the D2-DCM, make sure this switch is in the ON position.

In the OFF position, this switch logically disconnects the D2-DCM from the network (just as if you pulled the cable from the connector). Once this switch is moved to the OFF position, the D2-DCM will not communicate with the network. If you move the switch to the ON position, the D2-DCM will communicate with the network, but not until the master sends another request for communication. This does not operate like the reset switch on many personal computers.

