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## Appendix 2 PROTOCOL OPTION

You may order a DMXter4 with an option that allows it to send and receive Colortran's proprietary digital protocol. This protocol is usually referred to as CMX. It is the parent protocol on which DMX512 was based. The primary difference between CMX and DMX512 is that CMX uses a baud rate of 153.6K while DMX512 uses a baud rate of 250K. A side note: the baud rate of CMX has often erroneously been listed as 156K.

This option should be of great use to anyone servicing systems that use this protocol. Many of the DMXter4's features support CMX, but certain differences must be taken into account.

Colortran is field retrofittable on DMXter4. This option is also retrofittable to all existing *Lil'*DMXters, but it requires that the unit be returned to the factory for additional hardware.

### A2.1 HOW TO IDENTIFY CMX EQUIPPED DMXTER4S

A DMXter4 fitted with this option is identified by a 'C' after the software version number.

### A2.2 NAMING CONVENTIONS FOR THE CMX PROTOCOL

The DMXter4's software uses either `COLORTRAN` or `'CTN'` in its display messages to identify the CMX protocol. The reason for this is that at a quick glance CMX and DMX are easily confused in the block letter character set of the LCD display. This naming change is done only for clarity.

### A2.3 SELECTING THE CMX PROTOCOL

The primary standard of units fitted with this option is still DMX512. Units so fitted must be switched via software to `mode`. Once switched they will stay that way until switched back or until the power-up defaults are restored.

There are two methods of changing the unit to `mode`. One is by way of a switch in the `SETUP OPTIONS` menu. This is a bidirectional switch which will offer the user whichever standard the unit is not currently set for. If the unit is set for DMX512 the display will read:

```
| DATA IS DMX |  
| SET FOR COLORTRAN |
```

Using this switch will set the START Code to zero. Returning the switch to DMX also resets the START Code. The other method is a new 'flavor' in the **TRANSMIT DMX512, SEND FLAVOR** submenu.

```
| SEND FLAVOR? |  
| CMX 153.6k |
```

The following should be noted: While DMX512 flavors only affect transmitted DMX, the **CMX 153.6k** flavor sets the DMXter4 to transmit and receive CMX. Also there is only one transmit flavor available for CMX. The values for this flavor are listed below. Using this switch will set the START Code to zero.

### A2.3 HOW TO TELL IF A DMXter4 IS SET TO CMX PROTOCOL

If you have pressed `<TOP>` the DMXter4 is sitting on the Transmit menu; the display will be changed if the unit is set to CMX.

```
| MAIN MENU |  
| TRANSMIT COLORTRAN? |
```

The Receive menu item also changes to:

```
| MAIN MENU |  
| RECEIVE COLORTRAN? |
```

The displays for other **MAIN MENU** items do not change when the protocol is switched. But all of these functions will now support protocol.

## A2.4 CHANGES TO TRANSMIT MENU ITEMS

Any Transmit menu item that has a first line that normally reads TRANSMIT DMX512 will change to read TRANSMIT Colortran.

The SEND/EDIT SNAPSHOT routine display matrix is changed. The first example below is a possible display of a DMXter4 without the CMX option.

```
SLT:  1   2   3   4
LEV:  98  FF  50   0
```

The following examples are for units fitted with the CMX option. When the protocol is set to DMX512 the display will be as shown below. The field that used to read LEV is changed to read DMX to indicate the current protocol setting.

```
SLT:  1   2   3   4
DMX  98  FF  50   0
```

When the protocol is set to CMX the display will be as shown below. The field that used to read LEV is changed to read CTN to indicate the current protocol setting.

```
SLT:  1   2   3   4
CTN:  98  FF  50   0
```

### A2.4.1 The Change Send Flavor Submenu & CMX

```
| TRANSMIT COLORTRAN |          | TRANSMIT DMX512   |
| CHANGE SEND FLAVOR?|          | CHANGE SEND FLAVOR?|
```

On a DMXter4 equipped with the option there is an additional flavor entry. It is the last selection. Hence, it is

```
|      SEND FLAVOR?  |
|      CMX 153.6k    |
```

Selecting this flavor sets the unit, **including resetting the START Code, to zero**. Using the <UP> or <DOWN> keys to move to another flavor, accept that flavor by pressing the <YES/Q>. Selecting a **DMX flavor does not reset the START Code** to zero. However, there is no reason that it should be other than zero.

### A2.4.2 Changing the START Code While in CMX Mode

The submenu item that allows the DMXter4 to set the START Code to non null values is available when the unit is in CMX mode. It is left active to keep the unit's behavior as similar as possible in both protocol modes. We know of no valid CMX uses where the slot used as the START Code in DMX is anything but a null. Therefore we doubt that you will ever need this feature in CMX.

Note that whenever the protocol is changed either from DMX to CMX or CMX to DMX, the START Code is reset to a null (zero) value.

## A2.5 CHANGES TO RECEIVE MENU ITEMS

Any Receive menu item that has a first line that normally reads RECEIVE DMX512 will change to read RECEIVE COLORTRAN.

The VIEW LEVELS routine display matrix has been changed in the same way as the SEND/EDIT SNAPSHOT display. The LEV characters have been replaced by CTN.

### A2.6 CMX View Parameters Works the Same as in DMX

If you have used the CMX feature on a *Lil'DMXter* you may remember that you had to use a correction factor with some of the measured parameters. This not the case with DMXter4. The measurement routines are identical for either protocol.

## A2.6 COLORTRAN CMX TIMINGS, AND GDC'S CMX FLAVOR

The following section gives in tabular form some of the important timing information for CMX.

	Ideal Times	DMXter4 times
CMX Baud Rate	153.6 k Baud	150 k baud
CMX Bit Time	6.5104 $\mu$ s	6.667 $\mu$ s
CMX Frame Time	71.615 $\mu$ s	73.33 $\mu$ s
BREAK		214.8 $\mu$ s
MAB		19.53 $\mu$ s
Break to Break		40316 $\mu$ s
Slots Per Packet	512	512
Baud Rate Error		-1.9%

The DMXter4 can produce a baud rate that is close to ideal for CMX protocol. It cannot produce the exact baud rate. The baud rate is within workable tolerances.

## A2.7 CMX FLICKER FINDER

The CMX version has the same display and is operationally identical to the DMX version. The test is run at the CMX baud rate.

## A2.8 CMX CABLE TESTER

The CMX version is operationally and display identical to the DMX version. The test is run at the CMX baud rate. This means that some cables may pass the CMX data test that would fail the DMX data test. This is appropriate since CMX makes lower demands of its cable.

## A2.9 CMX SHOWSAVER

The operation of CMX ShowSaver is identical to the DMX version. The only display difference is that when editing levels the LEV characters are changed to CTN as they are in SEND EDIT.

Since changing protocols does not change any recorded ShowSaver looks it is possible to record looks from a console set to one protocol, say DMX512, and then switch protocol to the other to play them back. This could get you out of a very tight spot someday.

If the DMXter4 is set to enter DMX (CMX) Monitor mode and receives data sent on the protocol that it is not set for, it will act just as if it saw no data at all. No additional indication of a problem is given.

## A2.10 ROUTINES INCOMPATIBLE with COLORTRAN

The following are incompatible with Colortran;

- ShowPlayer
- DMX text packet
- SIPs
- RDM