# TessEm



# Connections

**ND040011E**

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# Contents                                                    Page

# 1 Introduction

## 1.1 General Information

The purpose of this document is to give an overview of how to connect peripheral equipment to the *TessEm* software products.

These products emulate the functionality of the ABB (originally ASEA) TESSELATOR family of color graphic systems. It runs on a standard PC under the Microsoft Windows 7, Windows Vista, Windows XP or Windows 2000 operating system.

The product uses standard TESSELATOR symbol libraries to achieve the same "look and feel" as the original TESSELATOR systems. All existing TESSELATOR compatible keyboards and trackballs can be used as input devices.

By using a standard PC with the Windows 7, Windows Vista, Windows XP or Windows 2000 operating system the software emulator has the ability to take advantage of the myriad of peripheral equipment on the market from third party vendors. Thus the user is free to select I/O devices such as monitors, keyboards, printers etc, but still keep the unique TESSELATOR functionality.

The *TessEm* software products contains of following applications:

- *TessEm$^{7000}$*, the TESSELATOR 7000 emulator

- *TessEm$^{8000}$*, the TESSELATOR 8000 emulator

- *TessEmCfg*, the configuration application.
  The application is used to configure the *TessEm* emulators.

- *TessEmLM*, the *TessEm* License Manager.
  The application is used to activate licenses and options for the *TessEm* emulators.

- *TessSymb*, the enhanced symbol editor.
  The application contains functions to create and edit symbol libraries used by the *TessEm* emulators.

# 2  TESSELATOR 7000

## 2.1  General Information

The ABB TESSELATOR 7000 is a low-end color graphics display system with a screen resolution of 720 x 336 pixels. The symbol information is positioned with a resolution of 240 x 112 tessel, by using a tessel size of 3 x 3 pixels.

The system contains also functions for local display storage in RAM and presentation of trend curves, bar graphs and other graphical objects with tessel resolution.

The ABB TESSELATOR 7000 is a stand-alone unit with the complete display generator electronics and the monitor included in one mechanical unit. Each system contains functions for communication with one host computer and one keyboard (both through asynchronous (RS 232 C) communication).

The models 7805/7815/7855 also contain functions for communication with one color graphic hard copy unit (through RS 232 C).



*Figure 1 ABB TESSELATOR 7000*

The following ABB TESSELATOR 7000 models are available:

- **DSID 7800**: ABB TESSELATOR 7800, the basic version with a 16" monitor. Part number: 5735 097-B (61.2 Hz frame rate), 5735 097-C (61.2 Hz frame rate).

- **DSID 7805**: ABB TESSELATOR 7805, the basic 16" monitor plus additional hardcopy capability. Part number: 5735 153-EA (61.2 Hz frame rate), 5735 153-EB (61.2 Hz frame rate).

- **DSID 7810**: ABB TESSELATOR 7810, the basic 15" monitor. Part number: 5735 153-KB (61.2 Hz frame rate).

- **DSID 7815**: ABB TESSELATOR 7815, the basic 15" monitor plus additional hardcopy capability. Part number: 5735 153-KC (61.2 Hz frame rate).

- **DSID 7850**: ABB TESSELATOR 7850, the basic version with a 20" monitor. Part number: 5735 150-E (61.2 Hz frame rate), 5735 153-CK (50 Hz frame rate), 5735 153-CL (60 Hz frame rate) or 5735 153-CM (61.2 Hz frame rate).

- **DSID 7855**: ABB TESSELATOR 7855, the basic 20" monitor plus additional hardcopy capability. Part number: 5735 150-A (61.2 Hz frame rate), 5735 153-CN (50 Hz frame rate), 5735 153-CP (60 Hz frame rate) or 5735 153-CR (61.2 Hz frame rate).

- **DSID 7550**: ABB TESSELATOR 7550, the 513 lines, 240 x 171 tessels, version with a 21" monitor. Part number: 5735 153-JA (50 Hz frame rate) or 5735 153-JB (60 Hz frame rate).

- **DSID 7555**: ABB TESSELATOR 7555, the 513 lines, 240 x 171 tessels, version with a 21" monitor plus additional hardcopy capability. Part number: 5735 153-JD (50 Hz frame rate) or 5735 153-JE (60 Hz frame rate).

## 2.2 Asynchronous Connections

The ABB TESSELATOR 7800 models uses asynchronous connections with the following type of equipments:

- Keyboard: ABB DSIH 70/71/72/90, ABB QDHI 01 or others.

- Host Computer: ABB MasterView 810/830 or others.

- Hardcopy printer.

Asynchronous communication by using the RS 232 C (V.24) standard signal interface is done by using the DB25-pin female connectors located on the DB 25 Connection Unit at the rear of the unit.

The Figure 2 shows the DB25 Connection Unit on the DSTV 700 Connection Board in the TESSELATOR 7800 system.
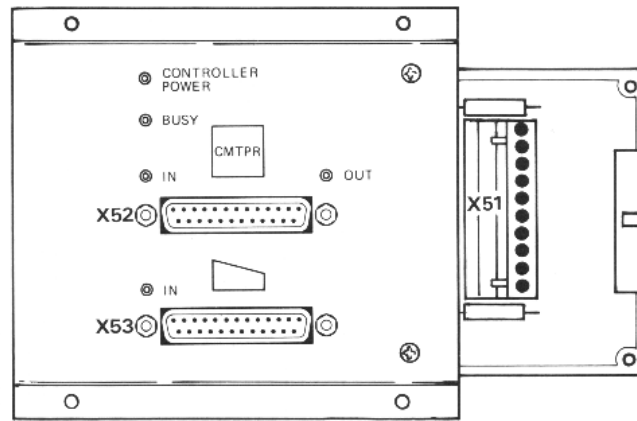
DB 25 Connection Unit
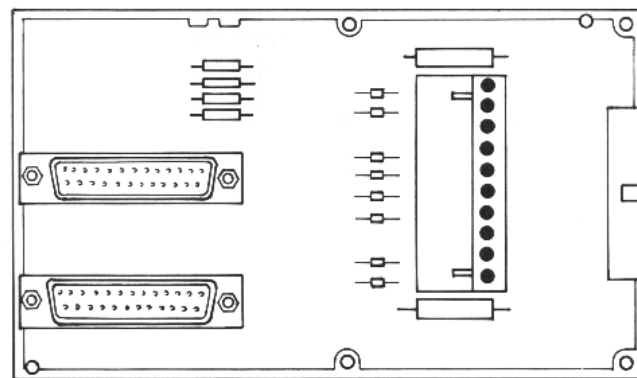


DSTV 700 Connection Board

*Figure 2 TESSELATOR 7800 DB25 Connection Unit*

Asynchronous communication using the Balanced Current Loop signal interface a short-range modem must be connected.

Asynchronous communication by using the Balanced Current Loop signal interface is done by using the KM-1 Interface through the X51 connector on the DSTV 700 Connection Board at the rear of the unit.

The Figure 3 shows a rear view of a TESSELATOR 7800 with a host computer connection through the KM-1 Interface.
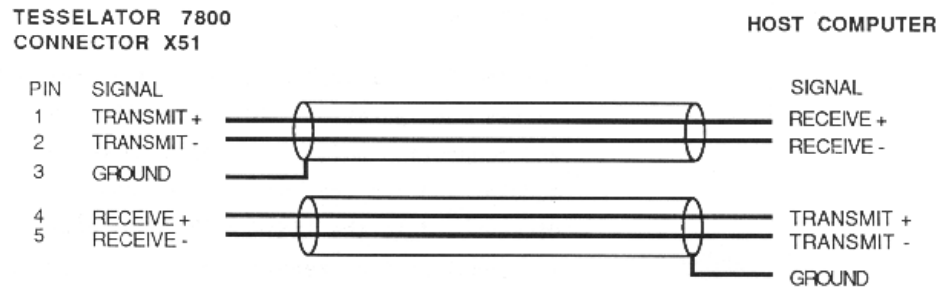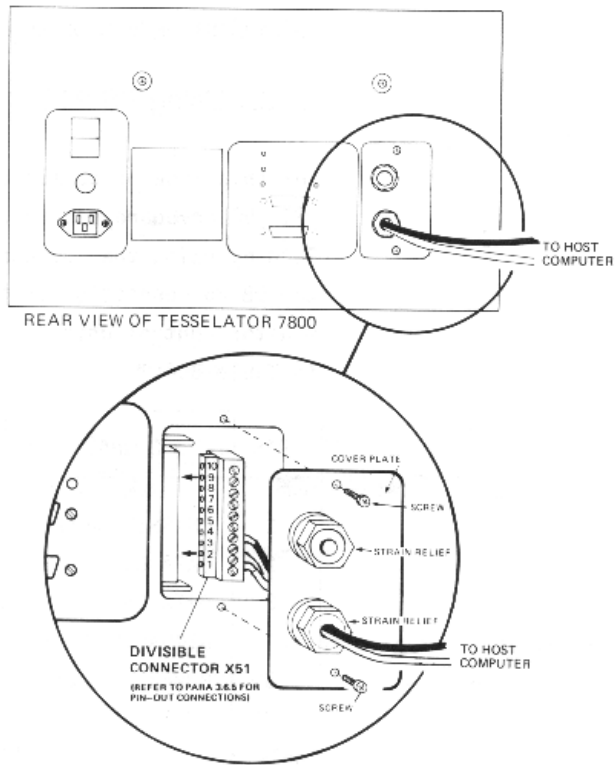
*Figure 3 TESSELATOR 7800 host computer KM-1 Interface.*

## 2.2.1 Communication Default Values

The following default values were standard at delivery of the TESSELATOR 7800 systems.

## 2.2.1.1 Host Computer Communication

- **Speed:** 9600 Baud.
  19200 Baud (Master View 810/830).

- **Word length:** 8 bits.

- **Parity:** Even.

- **Stop bits:** 1 bit.

## 2.2.1.2  Keyboard Communication

- **Speed:** 4800 Baud.
- **Word length:** 8 bits.
- **Parity:** Even.
- **Stop bits:** 1 bit.

# 3  TESSELATOR 8000

## 3.1  General Information

The ABB TESSELATOR 8000 (models 8110, 8310, 8410, 8120, 8320 and 8420) is a low-cost high performance multi-channel color graphics display system with a screen resolution of 720 x 336 pixels. The symbol information is positioned with a resolution of 240 x 112 tessel, by using a tessel size of 3 x 3 pixels.

The system contains also functions for local display storage in RAM or on floppy disc (only models 84x0), presentation of trend curves, bar graphs and other graphical objects with tessel resolution and 4 times true-hardware zoom function.

The ABB TESSELATOR 8000 contains plug-in circuit boards mounted in a 19´´ rack. Up to three display channels could be installed in the system. Each system also contains functions for communication with up to four host computers (through synchronous (X.25), asynchronous (RS 232 C) or Local Area Network (only 8x20 models) communication, up to four keyboards (through RS 232 C), up to two printers (through RS 232 C) and one color graphic hard copy unit (through RS 232 C).



*Figure 4 ABB TESSELATOR 8000*

The following ABB TESSELATOR 8000 models are available:

- **DSIC 8790:** ABB TESSELATOR 8100 with DSSR 115 + DSSA 110 power supply. DSPC 153 CPU card. One display channel. Part number: 5735 083-X (110/220 V, 50 Hz frame rate).

- **DSIC 8890:** ABB TESSELATOR 8100 with DSSR 115 + DSSA 110 power supply. DSPC 153 CPU card. One display channel. Part number: 5735 083-X (110/220 V, 61.2 Hz frame rate).

- **N/A:** ABB TESSELATOR 8110 with DSSR 116 + DSSA 110 power supply. One display channel. DSPC 155 CPU card. Part number: 5735 083-DX (220 V, 50 Hz

frame rate), 5735 083-DV (220 V, 61.2 Hz frame rate), 5735 083-DU (110 V, 61.2 Hz frame rate).

- **DSIC 8710:** ABB TESSELATOR 8300 with DSSD 110 power supply. Up to three display channels. DSPC 153 CPU card. Part number: 5735 083-BM (220 V, 50 Hz frame rate).

- **DSIC 8712:** ABB TESSELATOR 8310 with DSSD 110 power supply. Up to three display channels. DSPC 155 CPU card. Part number: 5735 151-A (220 V, 50 Hz frame rate).

- **DSIC 8810:** ABB TESSELATOR 8300 with DSSD 110 power supply. Up to three display channels. DSPC 153 CPU card. Part number: 5735 083-BN (220 V, 61.2 Hz frame rate).

- **DSIC 8812:** ABB TESSELATOR 8310 with DSSD 110 power supply. Up to three display channels. DSPC 155 CPU card. Part number: 5735 151-B (220 V, 61.2 Hz frame rate.

- **DSIC 8860:** ABB TESSELATOR 8300 with DSSD 111 power supply. Up to three display channels. DSPC 153 CPU card. Part number: 5735 083-BP (110 V, 61.2 Hz frame rate.

- **DSIC 8862:** ABB TESSELATOR 8310 with DSSD 111 power supply. Up to three display channels. DSPC 155 CPU card. Part number: 5735 151-C (110 V, 60 Hz frame rate.

- **DSIC 8718:** ABB TESSELATOR 8400 with DSSD 110 power supply. Up to three display channels. DSPC 153 CPU card and diskette unit. Part number: 5735 083-BR (220 V, 50 Hz frame rate).

- **DSIC 8818:** ABB TESSELATOR 8400 with DSSD 110 power supply. Up to three display channels. DSPC 153 CPU card and diskette unit. Part number: 5735 083-BS (220 V, 61.2 Hz frame rate).

- **DSIC 8868:** ABB TESSELATOR 8400 with DSSD 111 power supply. Up to three display channels. DSPC 153 CPU card and diskette unit. Part number: 5735 083-BT (110 V, 61.2 Hz frame rate).

- **N/A:** ABB TESSELATOR 8120, 8320 and 8420 with DSSD 100/111 power supply. Up to three display channels. DSPC 155 CPU card and DSCS 150 communication card (IEEE 802.3).

## 3.2 Asynchronous Connections

The ABB TESSELATOR 8000 models uses asynchronous connections with the following type of equipments:

- Keyboard: ABB DSIH 7x/90, ABB QDHI 01 or others.

- Host Computer.

- Hard copy printer.

- Typewriter printer.

The DSTC 120 Connection Unit is used for RS 232 C (V.24) asynchronous communication. This includes the balanced current loop short-range (short haul) modem facility and serves two serial ports. For more detailed information see section 4.1.2.1.1.

## 3.2.1  Communication Default Values

The following default values were standard at delivery of the TESSELATOR 8000 systems.

### 3.2.1.1  Host Computer Communication

- **Speed:** 9600 Baud.
- **Word length:** 8 bits.
- **Parity:** Even.
- **Stop bits:** 1 bit.

### 3.2.1.2  Keyboard Communication

- **Speed:** 4800 Baud.
- **Word length:** 8 bits.
- **Parity:** Even.
- **Stop bits:** 1 bit.

### 3.2.1.3  Typewriter Communication

- **Speed:** 1200 Baud.
- **Word length:** 7 bits.
- **Parity:** Even.
- **Stop bits:** 1 bit.

# 4 *TessEm* connections

## 4.1 Asynchronous Connections

The *TessEm* software products use asynchronous connections with the following type of equipments:

- Keyboard: ABB DSIH 7x/90, ABB QDHI 01 or others.

- Host Computer: ABB Master View 810/830 or others.

- Printer: Any type of Type Writers.

The asynchronous communication in *TessEm* is carried out using the PC serial ports, COM-ports, with RS 232 C (V.24) standard signal interface. Usually the PC is equipped with one or two DB9-pin male connectors. The old TESSELATOR equipment provides DB25-pin female connectors.

The Table 1 shows the relationship between asynchronous communication signals and DB9/DB25 connector pin out.

| DB25 Pin No. | DB9 Pin No. | Abbreviation | Full Name |
|---|---|---|---|
| 2 | 3 | TD | Transmit Data |
| 3 | 2 | RD | Receive Data |
| 4 | 7 | RTS | Request To Send |
| 5 | 8 | CTS | Clear To Send |
| 6 | 6 | DSR | Data Set Ready |
| 7 | 5 | SG | Signal Ground |
| 8 | 1 | DCD | Data Carrier Detect |
| 20 | 4 | DTR | Data Terminal Ready |
| 22 | 9 | RI | Ring Indicator |

*Table 1 Asynchronous Communication Signals and DB9/DB25 Pin Connector*

Generally the *TessEm* products only use three (3) pins, Transmit Data (TD), Receive Data (RD) and Signal Ground (SG), to communicate with peripheral equipments. Exceptions are described in separate sections. The Figure 5 shows the cable pin out required for *TessEm*.

| *TessEm* | | | **Peripheral Equipment** | |
|---|---|---|---|---|
| DB9 | | | DB25 | DB9 |
| 3 | TD ⟶ | RD | 3 | 2 |
| 2 | RD ⟵ | TD | 2 | 3 |
| 5 | SG ⟷ | SG | 7 | 5 |
| 4 | DTR | DTR | 20 | 4 |
| 6 | DSR | DSR | 6 | 6 |
| 1 | DCD | DCD | 8 | 1 |
| 7 | RTS | RTS | 4 | 7 |
| 8 | CTS | CTS | 5 | 8 |

*Figure 5 Required pin out connection for the **TessEm** products*

### 4.1.1 Keyboard Communications

The *TessEm* software products use asynchronous connections with keyboards of type ABB DSIH 7x/90, ABB QDHI 01 or others.

### 4.1.1.1 ABB DSIH 7x/90 Signal Interface RS 232 C (V.24)

The Figure 6 shows the cable pin out required for connection of an ABB DSIH 7x/90 keyboard to the *TessEm* products using the RS 232 C (V.24) standard signal interface.

| *TessEm* | | | | *DSIH 7x/90* |
|---|---|---|---|---|
| DB9 | | | | DB25 |
| 3 | TD | ⟶ | RD | 3 |
| 2 | RD | ⟵ | TD | 2 |
| 5 | SG | ⟷ | SG | 7 |
| 4 | DTR | | DTR | 20 |
| 6 | DSR | | DSR | 6 |
| 1 | DCD | | DCD | 8 |
| 7 | RTS | | RTS | 4 |
| 8 | CTS | | CTS | 5 |

*Figure 6 Connection of DSIH 7x/90 to the TessEm products*

### 4.1.1.2 ABB QDHI 01 Signal Interface RS 232 C (V.24)

The Figure 7 shows the cable pin out required for connection of an ABB QDHI 01 keyboard to the *TessEm* products using the RS 232 C (V.24) standard signal interface.

| *TessEm* | | | | *QDHI 01* |
|---|---|---|---|---|
| DB9 | | | | DB25 |
| 3 | TD | ⟶ | RD | **2** |
| 2 | RD | ⟵ | TD | **3** |
| 5 | SG | ⟷ | SG | 7 |
| 4 | DTR | | DTR | 20 |
| 6 | DSR | | DSR | 6 |
| 1 | DCD | | DCD | 8 |
| 7 | RTS | | RTS | 4 |
| 8 | CTS | | CTS | 5 |

*Figure 7 Connection of QDHI 01 to the TessEm products*

**NOTE:** Pin out 2 and 3 on QDHI 01 are switched from normal.

## 4.1.2  Computer Communications

The **TessEm** software products use asynchronous connections with host computers of type ABB Master View 810/830 or others.

## 4.1.2.1  ABB MasterView 810/830

ABB MasterView 810/830 is a MMI (Man-Machine-Interface) system.

The Figure 8 shows the original configuration of the ABB MasterView 810 and 830 systems.
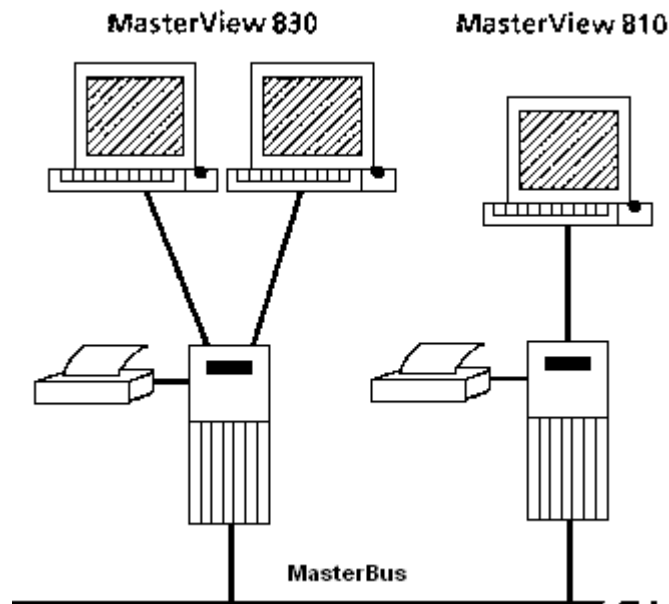


*Figure 8 ABB MasterView 810/830*

The MasterView 810 and 830 uses built-in connection units of type DSTC 120 to connect to the **TessEm** products.

## 4.1.2.1.1  Connection Unit DSTC 120

The DSTC 120 Connection Unit is used for RS 232 C (V.24) asynchronous communication. This includes the balanced current loop short-range (short haul) modem facility and serves two serial ports. The DSTC 120 connector layout is showed in Figure 9.
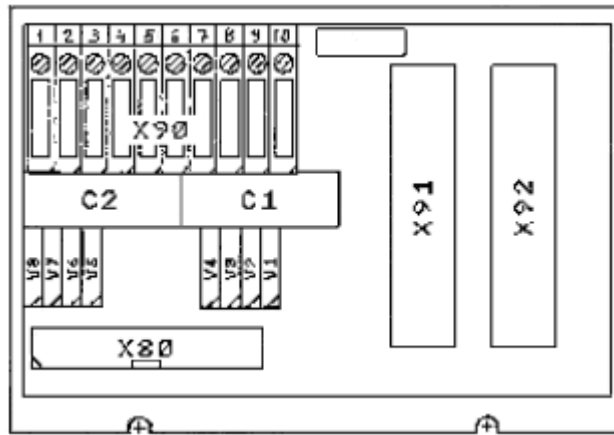
*Figure 9 DSTC 120 Connection Unit*

| Connector: | X80 |
|---|---|
| Connection type: | Pin connector for ribbon cable 26 pin |
| Application: | Connection to asynchronous communication board DSCA 114. |
| Connector: | X90 |
| Connection type: | Screw terminal block, max 2.5 mm$^2$ conductor area |
| Application: | Terminal for short-range modem (balanced current loop) |
| Connector: | X91, X92 |
| Connection type: | DB25 |
| Application: | Connection to communication line |

The Table 2 shows the terminal strip pins out for short-range modem.

| | Port A (odd) | Port B (even) | Connector X90 |
|---|---|---|---|
| **AOPTOUTA** | OUT (T+) | - | 1 |
| **BOPTOUTA** | OUT (T-) | - | 2 |
| **AOPTINA** | IN (R+) | - | 4 |
| **BOPTINA** | IN (R-) | - | 5 |
| **AOPTOUTB** | - | OUT (T+) | 6 |
| **BOPTOUTB** | - | OUT (T-) | 7 |
| **AOPTINB** | - | IN (R+) | 9 |
| **BOPTINB** | - | IN (R-) | 10 |
| **Chassi Ground** | - | - | 3 and 8 |

*Table 2 Terminal strip pins out for short-range modem on DSTC 120*

## 4.1.2.1.2  ABB MasterView 810/830 Signal Interface RS 232 C (V.24)

The Figure 10 shows the cable pin out required for connection of MV 810/830 to the *TessEm* software products using RS 232 C (V.24) standard signal interface:

| *TessEm* | | | | **MV 810/830** |
|---|---|---|---|---|
| DB9 | | | | DB25 |
| 3 | TD | ⟶ | RD | 3 |
| 2 | RD | ⟵ | TD | 2 |
| 5 | SG | ⟷ | SG | 7 |
| 4 | DTR | | DTR | 20 |
| 6 | DSR | | DSR | 6 |
| 1 | DCD | | DCD | 8 |
| 7 | RTS | | RTS | 4 |
| 8 | CTS | | CTS | 5 |
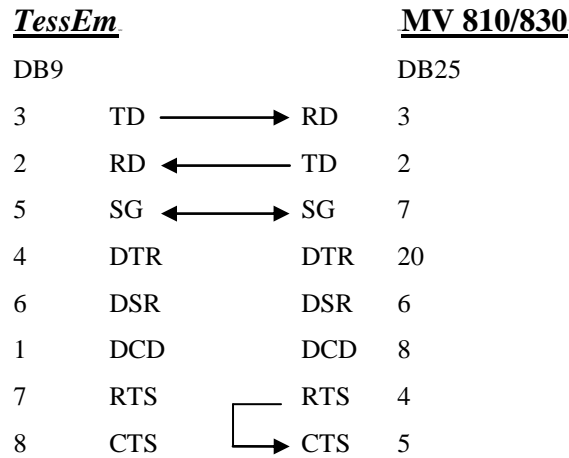
*Figure 10 Connection of MV 810/830 to the **TessEm** products*

## 4.1.2.1.3  ABB MasterView 810/830 Signal Interface (Balanced Current Loop)

To connect an ABB MasterView 810/830 to a *TessEm* product using the Balanced Current Loop signal interface a short-range modem must be connected.

Westermo MA-12 short-range modem has been tested with the *TessEm* products. The switch settings of the MA-12 short-range modem are according to the factory settings shown in Figure 11.

**Factory settings**

S1 [ON  1 2 3 4 5 6 7 8 9 ]

*Figure 11 Westermo MA-12 factory settings of switch S1*

For more information about the MA-12 short-range modem, see the Westermo company web site at http://www.westermo.com/.

The Figure 12 shows the line connection and the RS 232 C (V.24) connection at the rear back of the MA-12 short-range modem.
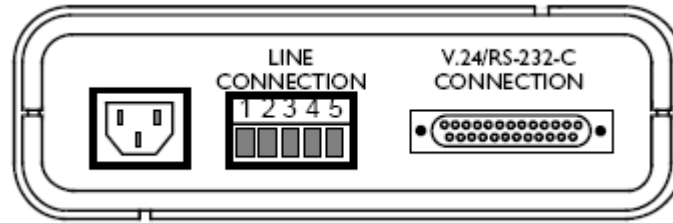


*Figure 12 Westermo MA-12 Connections*

The line connection is used to connect to the DSTC 120 connection unit on an ABB MasterView 810/830 and the RS 232 C (V.24) connection is used to connect to the *TessEm* products.

The Table 3 shows the line connections description.

| Direction | No. | Description |
|---|---|---|
| Receiver | 1 | R+ |
| Receiver | 2 | R- |
| Transmitter | 3 | T+ |
| Transmitter | 4 | T- |
| | 5 | Shield |

*Table 3 Line connections description*

The DSTC 120 connection unit shall be connected to the MA-12 line connection using twisted cable pairs according to Table 4.

**NOTE:** If shielded cable is used, connect the shield only at one end to avoid ground currents.

| DSTC 120 Connector X90 | MA-12 Line Connection |
|---|---|
| 1 (T+) | 1 R+ |
| 2 (T-) | 2 R- |
| 4 (R+) | 3 T+ |
| 5 (R-) | 4 T- |

*Table 4 Terminal Connections between DSTC 120 and MA-12*

The Figure 13 shows the cable connection between the *TessEm* products and the MA-12 RS 232 C (V.24) connection.

**_TessEm_**          **MA-12**

DB9          DB25, RS 232 C (V.24)
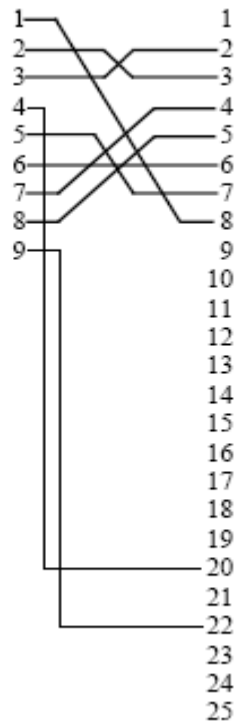


*Figure 13 Connection of MA-12 to the **TessEm** products*

## 4.1.3  Printer Communications

The Figure 14 shows the cable pin out required for connection of a Type Writer to the *TessEm* products.

| *TessEm* | | | | *Type Writer* |
|---|---|---|---|---|
| DB9 | | | | DB25 |
| 3 | TD | ⟶ RD | | 3 |
| 2 | RD | ⟵ TD | | 2 |
| 5 | SG | ⟷ SG | | 7 |
| 4 | DTR | DTR | | 20 |
| 6 | DSR | DSR | | 6 |
| 1 | DCD | ⟶ DCD | | 8 |
| 7 | RTS | ⟶ RTS | | 4 |
| 8 | CTS | ⟶ CTS | | 5 |

*Figure 14 Connection of Type Writer to the **TessEm** products*

## 4.1.4  Serial PCI Cards

A PC with only one or need for several serial port connectors can use an additional serial PCI card.

**NOTE:** For communication with the host computer try to use a built-in COM-port on the PC mother board, if available! Configure the peripheral equipments such as keyboards, printers etc on the additional serial ports.

Following Serial PCI Cards has been tested with the *TessEm* products:

- **LAVA DSerial-PCI**: PCI Bus Dual Serial Port card with 16550 UART COM Ports. More information is found at the web site http://www.lavalink.com/.
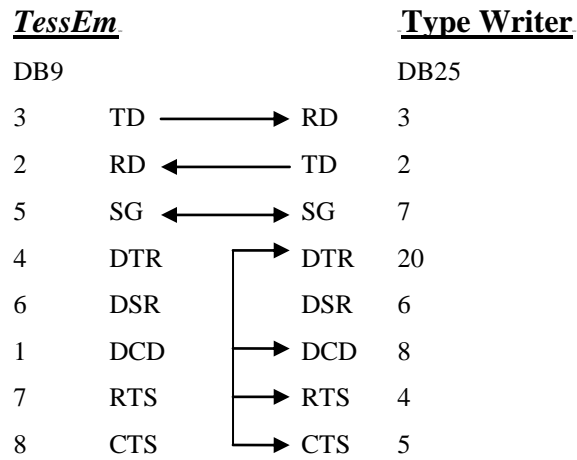
- **LAVA OCTOPUS-550**: PCI Bus 8 Port Serial card with 16550 UART COM Ports. More information is found at the web site http://www.lavalink.com/. **NOTE:** Must be revision "P.N.MOKO L81.1" or newer!

- **StarTech PCI2S950**: 2 Ports High-Speed 16950 Serial PCI Card. More information is found at the web site http://www.startech.com/.

- **NetMos 9835 PCI Multi-I/O Controller**: The card is using a MCS9835 is a PCI based dual-channel high performance UART with enhanced bi-directional parallel controller. More information is found at the web site http://www.moschip.com/pepc.php/.

- **DeLock 89004 PCI card:** 32-Bit PCI card with 2 serial ports and 1 parallel port which uses a 16C550 UART. More information is found at the web site http://www.delock.de/produkte/gruppen/IO+Karten/.

## 4.1.5  USB Serial Adapter

Newcon Data AB has experienced problems using USB adapter together with the *TessEm* products. Therefore we don't recommend use of USB serial adapters!

Despite that has one customer successfully used a USB-to-Serial Adapter from the company Belkin. More information is found at the web site http://www.belkin.com/.

**NOTE:** If you anyway intend to use an USB adapter we still recommend using a built-in COM-port on the PC mother board, if available, for communication with the host computer!

## 4.2  Synchronous Connections

The *TessEm*$^{8000}$ software product can with the **X.25** option installed use synchronous connections with the following type of equipments:

- Host Computer: ABB Master View 850, ABB SINDAC or others.

## 4.2.1  Computer Communications

The synchronous communication is based on the **HDLC** (High-Level Data Link Control procedure), as specified by the CCITT X.25 layer 2 **LAPB** (Link Access Procedure-Balanced protocol) recommendations.

The **X.25** option adds up to four individual synchronous channels, each with maximum communication speed of 8.448 Mbits/s, to the *TessEm*$^{8000}$ product. The X.21, RS-442 or RS-449 communication interface can be used.

The *TessEm*$^{8000}$ product uses the FarSync X25 T1U (1 port), FarSync X25 T2U (2 ports) or FarSync X25 T4U (4 ports) cards from Farsite Communications Limited for synchronous communication. Maximum one of these cards can be used together with the *TessEm*$^{8000}$ in a PC.

## 4.2.1.1 FarSync X25 TxU card

The FarSync TxU card type and PCI specification:

- 50MHz AMD Am186-CH (FS6140, FS6240)
- 50MHz AMD Am186-CC (FS6440)
- 1 Mbyte zero wait state SRAM
- Intelligent Universal bus mastering PCI card
- Short card (height 107mm, length 167mm)
- PCI-X compatible
- PCI v2.2 compliant
- Supports 3.3 & 5 volt signaling
- Suitable for 32 and 64 bit PCI bus slots
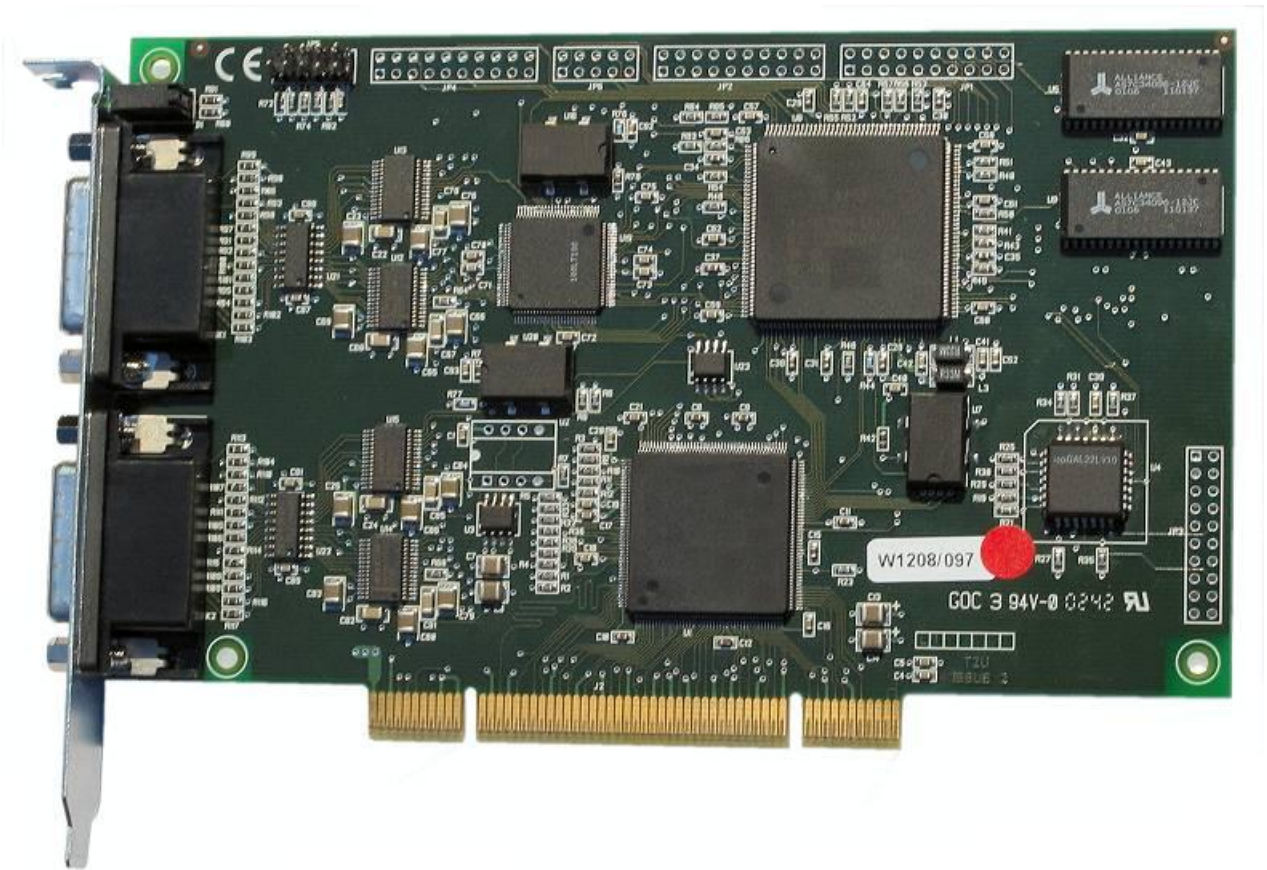


*Figure 15 FarSync X25 T2U card*

## 4.2.1.1.1 Signal Interface (X.21)

The Table 5 shows the relationship between synchronous communication signals and DB26 male connector pin out on the FarSync X25 TxU card.

| DB26 Pin No. | Abbreviation | Full Name |
|---|---|---|
| 2 | TXa | Send Data (A) |
| 11 | TXb | Send Data (B) |
| 3 | Sa | Send Timing (A) |
| 12 | Sb | Send Timing (B) |
| 4 | RXa | Receive Data (A) |
| 13 | RXb | Receive Data (B) |
| 6 | Ia | Clear To Send (A) |
| 15 | Ib | Clear To Send (B) |
| 5 | Ca | Request To Send (A) |
| 14 | Cb | Request To Send (B) |
| 9 | GND | Ground |
| 1 | SHIELD | Shield |

*Table 5 FarSync X25 TxU X.21 Signals and DB26 Pin Connect*

## 4.2.1.2  ABB MasterView 850

ABB MasterView 850 is a MMI (Man-Machine-Interface) system.

The Figure 16 shows the original configuration of the ABB MasterView 850 system.
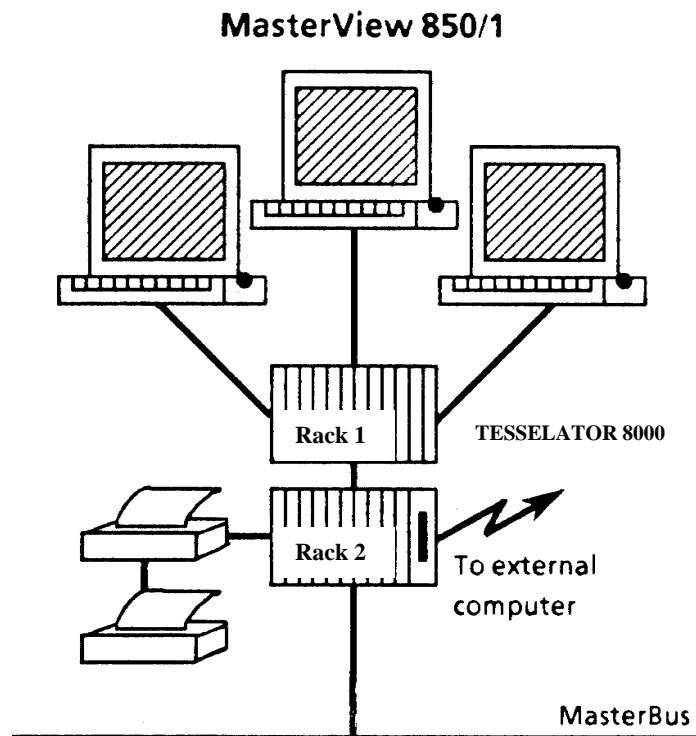


*Figure 16 ABB MasterView 850*

By using the *TessEm$^{8000}$* product the entire Rack 1 of the MasterView 850 system will be replaced by a PC.

The MasterView 850 usually uses connection units of type DSTC 110 to connect to the *TessEm$^{8000}$* product. But the MasterView 850 can also use the X1 connector on the DSCS 116 to directly connect to the *TessEm$^{8000}$* product.

## 4.2.1.2.1  Connection Unit DSTC 110 for RS 449

The DSTC 110 Connection Unit is used to connect devices for synchronous serial communication via modems or null modems to host computers. Data can be transmitted for distances of 15m (50 ft) to 50m (160 ft) depending of environment. The DSTC 110 has a signal interface to the modem or communication line, using the RS 449 standard.

A null modem means a passive link between two devices.

One DSTC 110 serves one channel on the DSCS 116 synchronous board in the MV 850. The DSTC 110 connector layout is showed in Figure 17.
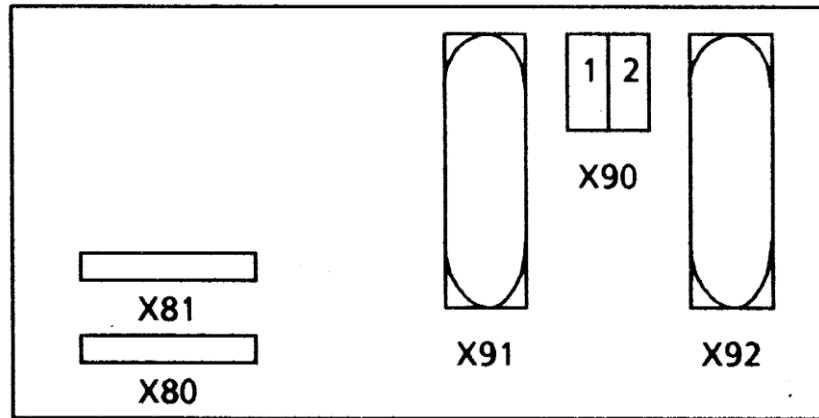
*Figure 17 DSTC 110 Synchronous Communication Connection Unit*

| | |
|---|---|
| Connector: | X80 |
| Connection type: | Pin connector for ribbon cable 26 pin |
| Application: | Connection to synchronous communication board DSCS 116 when using a modem.<br>**NOTE:** Not used in MV 850. |

| | |
|---|---|
| Connector: | **X81** |
| Connection type: | Pin connector for ribbon cable 26 pin |
| Application: | Connection to synchronous communication board DSCS 116 when functioning as a null modem, i.e. when a modem is not used.<br>**NOTE:** The cable from the DSCS 116 board should be connected here. |

| | |
|---|---|
| Connector: | **X91** |
| Connection type: | DB37 |
| Application: | Connection to the modem according to RS-449<br>**NOTE:** The cable from the **TessEm**$^{8000}$ should be connected here. |

| | |
|---|---|
| Connector: | X92 |
| Connection type: | DB37 |
| Application: | Connection when using as a null modem, i.e. without modem, according to RS-449<br>**NOTE:** Not used in MV 850 when connected to the **TessEm**$^{8000}$ |

The Figure 18 shows the wiring diagram of the DSTC 110 connection unit.

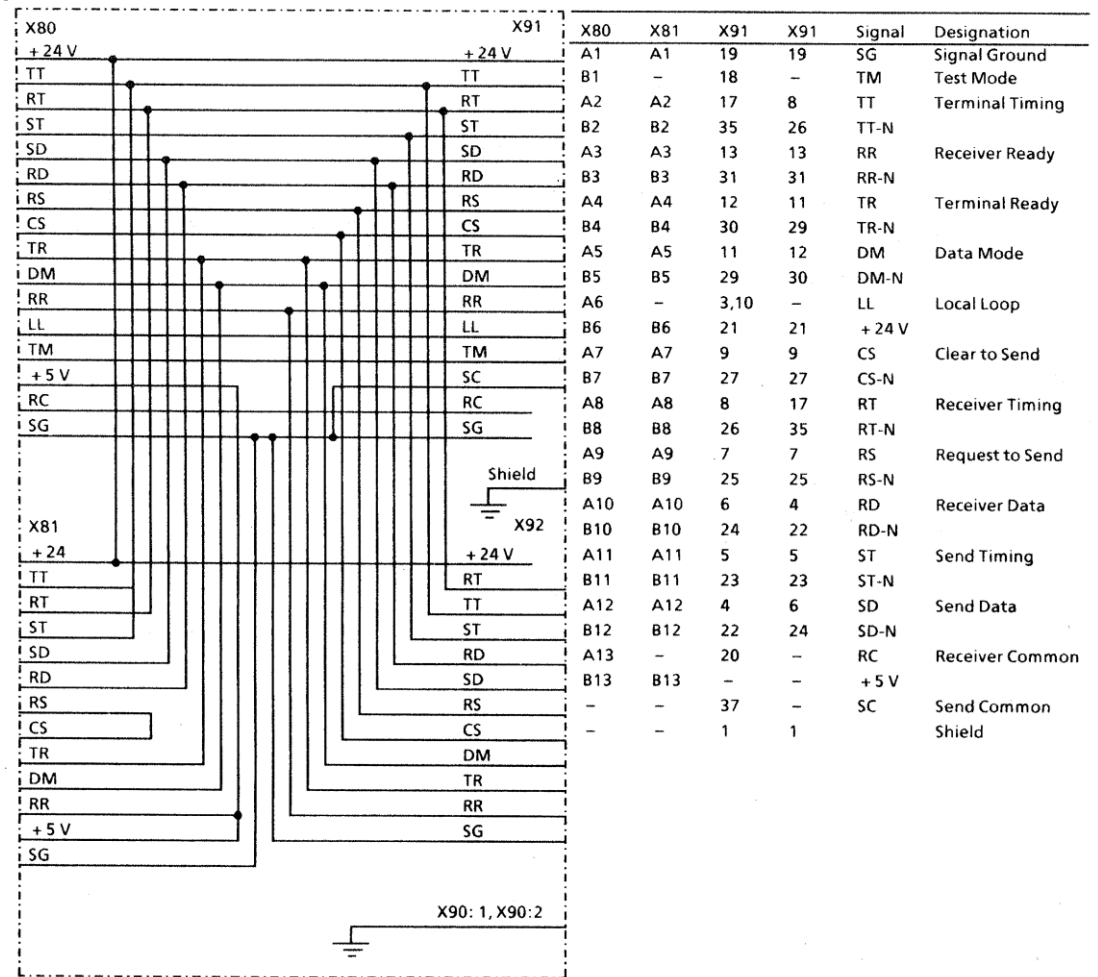| X80 | X81 | X91 | X91 | Signal | Designation |
|------|------|------|------|--------|------------------|
| A1 | A1 | 19 | 19 | SG | Signal Ground |
| B1 | – | 18 | – | TM | Test Mode |
| A2 | A2 | 17 | 8 | TT | Terminal Timing |
| B2 | B2 | 35 | 26 | TT-N | |
| A3 | A3 | 13 | 13 | RR | Receiver Ready |
| B3 | B3 | 31 | 31 | RR-N | |
| A4 | A4 | 12 | 11 | TR | Terminal Ready |
| B4 | B4 | 30 | 29 | TR-N | |
| A5 | A5 | 11 | 12 | DM | Data Mode |
| B5 | B5 | 29 | 30 | DM-N | |
| A6 | – | 3,10 | – | LL | Local Loop |
| B6 | B6 | 21 | 21 | + 24 V | |
| A7 | A7 | 9 | 9 | CS | Clear to Send |
| B7 | B7 | 27 | 27 | CS-N | |
| A8 | A8 | 8 | 17 | RT | Receiver Timing |
| B8 | B8 | 26 | 35 | RT-N | |
| A9 | A9 | 7 | 7 | RS | Request to Send |
| B9 | B9 | 25 | 25 | RS-N | |
| A10 | A10 | 6 | 4 | RD | Receiver Data |
| B10 | B10 | 24 | 22 | RD-N | |
| A11 | A11 | 5 | 5 | ST | Send Timing |
| B11 | B11 | 23 | 23 | ST-N | |
| A12 | A12 | 4 | 6 | SD | Send Data |
| B12 | B12 | 22 | 24 | SD-N | |
| A13 | – | 20 | – | RC | Receiver Common |
| B13 | B13 | – | – | + 5 V | |
| – | – | 37 | – | SC | Send Common |
| – | – | 1 | 1 | | Shield |

*Figure 18 Wiring diagram of the DSTC 110 connection unit*

## 4.2.1.3 ABB MasterView 850 Signal Interface (RS 449)

The Figure 19 shows the cable pin out required for connection of MV 850 using the DSTC 110 connection unit to the FarSync X25 T1U or T2U card in the *TessEm*[8000] product using RS 449 signal interface.

| RS 449 Signal | DB37 Pin (Female) | DB26 Pin (Male) | X.21 Signal | Signal Pair |
|---|---|---|---|---|
| Send Data (A) | 4 ———— | 4 | RXa | ⎤ |
| Send Data (B) | 22 ———— | 13 | RXb | ⎦ |
| Terminal Timing (A) | 17 ———— | 3 | Sa | ⎤ |
| Terminal Timing (B) | 35 ———— | 12 | Sb | ⎦ |
| Receive Timing (B) | 26 | | | |
| Receive Timing (A) | 8 | | | |
| Receive Data (A) | 6 ———— | 2 | TXa | ⎤ |
| Receive Data (B) | 24 ———— | 11 | TXb | ⎦ |
| GND | 19 ———— | 9 | GND | |
| SHIELD | 1 ———— | 1 | SHIELD | |
| | | 10 ⎤ | CABLE_IN | |
| | | 18 ⎦ | CABLE_IN | |

*Figure 19 Connection of MV 850 (DSTC 110) to the FarSync X25 TxU card*