Product: DVRG

Transfer of Video Stream Files
to and from
DTV Recorder Generator DVRG

Application Note

The DTV Recorder Generator DVRG is an inevitable tool for recording and replaying MPEG2 transport streams as well as uncompressed video files according ITU-R B.T. 601. Streams to be played out might be supplied from or recorded streams need to be transferred to another system. This application note describes how these rather large files can be transferred across the unit's boundaries.

ROHDE&SCHWARZ

Contents

1   Overview

Basically there are two possibilities given to transfer video stream files to or from the DVRG:

Compact Discs

For infrequent transfers of files that do not exceed the relevant file size limitations compact discs are an excellent tool.

The basic configuration without any options allows the installation of files up to a size of 650 Mbytes onto the DVRG. The following disc types can be used: CD-ROM, CD-R or CD-RW.

The optional drive DVRG-B5 supports reading of DVD-ROMs too. Therefore files of sizes up to the maximum of a DVD-ROM can be installed onto the DVRG. Newer models of DVRG can read DVD-ROM's with the default drive already.

If option DVRG-B5 is installed, writing of CD-R and CD-RW discs becomes possible, which allows also video stream files with a size not exceeding 650 Mbytes to be burned on a disc and transferred off DVRG onto another system.

Network Connection

Any files exceeding the constraints mentioned in the section above can exclusively be transferred using an Ethernet network connection. For frequent file transfers the network is also a very convenient method. Depending on the file size and the used network components a single transfer can be completed within a few seconds or can take some hours.

Since the DVRG hosts an IBM compatible PC workstation with Microsoft® Windows NT® Embedded 4.0 operating system networking is fairly easy. The application note 7BM07 (see section 5 – Literature) describes all about how to integrate DVRG into a TCP/IP network using Microsoft Network.

The maximum size of files to be transferred through a network connection is not limited in theory. However different file systems connected by Microsoft Network are somehow partly compatible only. If the remote PC is using Windows 95 or 98 the size of files to be transferred is limited to 2 Gbytes. The reason is that their file system is different to the NTFS file system Windows NT® is using on DVRG. Using the NTFS file system on the drive of the remote system either under Windows NT® or Windows 2000 operating systems is required for transferring video stream files larger in size than 2 Gbytes.

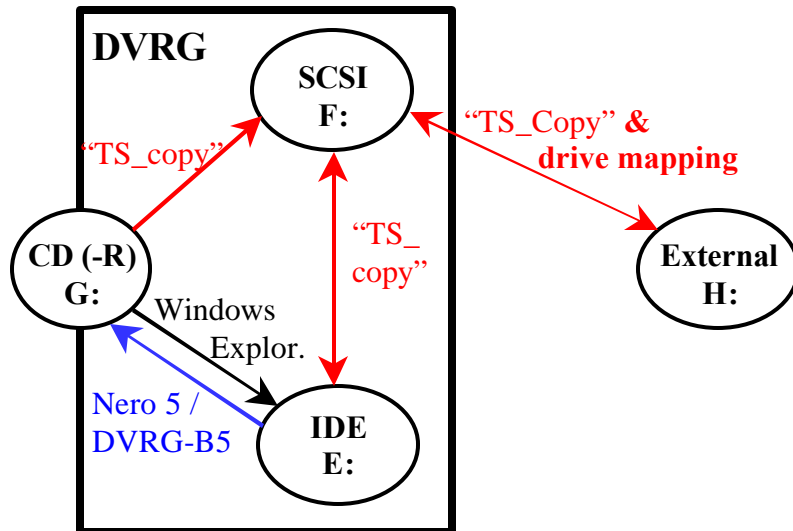# 2   Software Features and Limits

Drive Structure on DVRG

Fig. 1:   Overview about the locally accessible drives on DVRG with possible ways for file transfers.

Container File System CFS

In order to ensure a sufficient recording and play-out speed, video data like transport stream files (of types *.TRP and *.T10) and uncompressed video files (of types *.SDI and *.S10) are kept on DVRG in an application specific container file system (CFS). It resides on either one or two separate SCSI hard drives, which are independent from the system IDE drive. Assigning any drive letter to the SCSI drives with the system tool "Disk Administrator" is not advised and could result in malfunction of the unit.

The CFS drive is accessible for typical record and replay operations by the DVRG firmware either through the LC display, the front panel keys or the DVRG Commander software. The drive letter F: is been used only internally.

Utility TS_Copy

To transfer files between the CFS and the Windows NT® operating system the application program "TS_Copy" is included into the software of the DVRG. It becomes accessible when DVRG is booted in "Workstation mode". This requires an external VGA monitor, a keyboard and mouse connected to the instrument and user interaction upon booting the instrument.

The user interface of "TS_Copy" comprises of two windows, one for the CFS files system and the other one for all Windows NT® locally accessible file systems. These could be:

➢   Internal IDE drive E:

➢   Internal CD-ROM or DVD-ROM G:

➢   External drive on remote system, mapped i.e. as H:

By clicking on any of the files in any of the two windows the conversion and transfer process towards the other drive is started.

Video File Exchange with a remote PC

A Microsoft Network connection is employed for file exchange. Since DVRG may only be used as a client in a network connection all operations are initiated from the "Workstation" desktop of DVRG. The transfer process can be performed either with the Windows Explorer or directly with a one-click operation using the "TS_Copy" utility through the network.

Using the Windows Explorer for transferring video stream files requires usually a following import or a previous export process with the "TS_Copy" tool anyhow. Otherwise the video file will not be available to DVRG standard operations record or re-play utilizing the container file system CFS.

To reduce the amount of operations to one transfer process at all the second option using the "TS_Copy" utility through the network is recommended. For that purpose the counterpart drive on the remote system has to be mapped as a network drive to the Windows NT® system of DVRG. How to achieve that and also how to establish a basic Microsoft Network connection over TCP/IP is described in detail in the application note 7BM07 (see section 5 - Literature).

Connection of two DVRGs

In a network connection including two DVRG's a third PC system being the network server has to be present, since DVRG can perform client functionality only. Video file exchange between two DVRGs cannot be performed directly from one unit to the other. Separate connections of both DVRGs individually to the server have to be employed in that case.

3   Hardware and Software Requirements

In order to use all the software options referred to here in this application note, the DVRG always has to be booted in "Workstation mode". The wallpaper of that mode is displayed in Fig. 2:


Fig. 2:   Wallpaper of DVRG booted in "Workstation" mode

DVRG Mode of Operation Selection

During the boot process of DVRG at a very early stage the boot menu will appear and lets the user choose between the "Standalone" and the "Workstation" mode. "Standalone" is the default selection. It will be entered after five seconds of choice. Although a Windows NT® environment is appearing in the "Standalone" mode also, this mode won't let anything been stored permanently on the hard drives. The C: drive is write protected in "Standalone" mode to ensure proper booting capability

in any case, even when the unit was shut down or powered down accidentally.
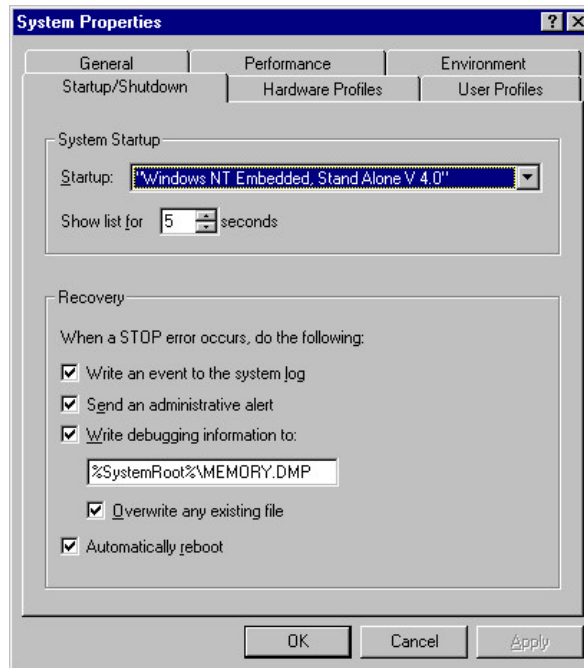
Workstation Mode

To avoid having to choose this mode manually during every boot process, the system can be changed in a way, so that the "Workstation" mode becomes the default boot mode. This change has to be applied in the Control Panel's "System Properties" folder under the tab "Startup/Shutdown" as shown in Fig. 3. The mode visible in the drag-down box is the default system startup mode.

Fig. 3:   Windows NT® System Startup and Shutdown properties

Software Requirements

DVRG firmware V1.11 or higher is required which includes the "TS_Copy" utility. Any other software requirement is part of the installed Microsoft Windows NT® Embedded.

4   Transferring Video Stream Files
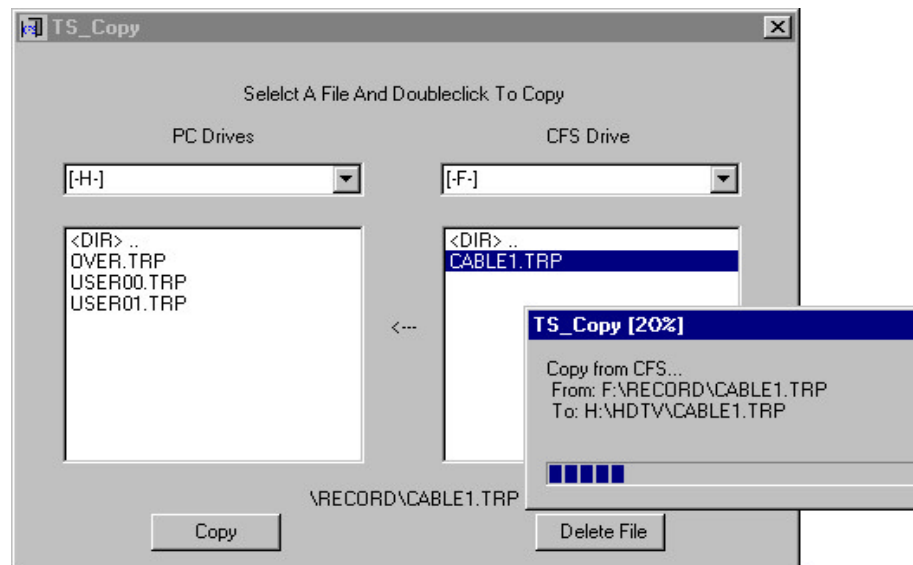
Utility TS_Copy

Fig. 4:   User Interface of the utility "TS_Copy while copying"

This software utility is used for video stream files to either enter or leave the container file system CFS. If a transport stream has to be installed for playout, it can enter the CFS through that tool. Vice versa if a recorded file shall leave the CFS for analysis or further processing on another platform, the "TS_Copy" utility is the means to get it out.

The utility is available only through the Workstation mode of DVRG by double clicking on the relevant desktop icon. The graphical user interface looks like shown in Fig. 4.

The right half of the window displays directories and files within the container file system CFS, which were either previously recorded or are ready to be played out. The left half of the window shows all available drives that are Windows NT® accessible ("PC Drives"). That includes the local IDE drives as well as all mapped network drives on a remote system, which are been assigned a drive letter within the Windows NT® operating system of DVRG. The mapping of the drives can be performed in Windows Explorer according to application note 7BM07 (see section 5 – Literature). It has to be completed before starting "TS_Copy" utility for the mapped drive to show up in the list of "PC Drives".

Double-clicking on the source file name starts a file transfer in any of the two directions. The example in Fig. 4 shows the file CABLE1.TRP to be exported out of the CFS system onto drive H:, which is actually mapped to a drive on another PC system connected to DVRG in the Microsoft Network. The drive letter H: is not used for local IDE drives on DVRG.

5 Literature

DVRG Operating Manual	2083.1360.12
Application Note: Integration of DTV Recorder Generator DVRG into a TCP/IP Network	7BM07_*E

6 Ordering Information

Rohde & Schwarz instrument	Type	Part number
DTV Recorder Generator DVRG	DVRG	2083.1302.02
Additional hard disk	DVRG-B2	2083.1919.02
SDI (ITU-R B.T. 601) record and play	DVRG-B4	2083.1948.02
Option CD-R R/W drive (DVD read only)	DVRG-B5	2083.1948.02
Option SMPTE310M interface	DVRG-B6	2083.1954.02

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