X300

(X300 Mark 2 and X300-16M)

TIMESPACE

INSTRUCTION MANUAL

DESIGNED AND MANUFACTURED
IN THE UK

X300 OPERATING SOFTWARE
V1.5.2

THE X300 MANUAL IS AVAILABLE
ONLINE: **www.tspace.co.uk**

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List of Abbreviations

Abbreviation	Meaning
AUX	Auxiliary
bps	Bits per second
CAN	Controller Area Network
CD	Compact Disk
CE	European Conformity
COM	Communication (port)
COMMS	Communications
DVR	Digital video recorder
EEC	European Economic Community
EMC	Electro-magnetic compatibility
EMG	Emergency (EMG Splash Screen)
FAT	File Allocation Table
FMS	Fleet Management System
FTP	File Transfer Protocol
FPS	Frames Per Second
GB	Gigabytes
GMT	Greenwich Mean Time
GND	Ground
GPS	Global positioning System
GSM	Global system (or standard) for mobile
HDD	Hard Disk Drive
HR	Hour
IP	Internet Protocol
IPS	Images per second
kHz	Kilohertz
KPH	Kilometres Per Hour
LAN	Local Area Network
LED	Light-Emitting Diode

MAC	Media Access Control
MB	Megabytes
MBR	Master Boot Record
MED	Medium
mics	Microphones
MIN	Minute
MPH	Miles Per Hour
NTSC	The television broadcasting system used in North America and Japan
OSD	On-screen display
PAL	Phase Alternating Line
PC	Personal Computer
PCB	Printed Circuit Board
PoE	Power over Ethernet
PTZ	Pan Tilt Zoom (camera)
QUAL	Quality
RES	Resolution
RH	Relative Humidity
RMS	Root Mean Square
RTSP	Real Time Streaming Protocol
s	Second
SD	Secure Digital (card)
SDHC	Secure Digital High Capacity
SEC	Second
SMART	Self-Monitoring, Analysis and Reporting Technology
SMS	Short Message System
TB	Terabyte
TCP	Transmission Control Protocol
TFL	Transport for London
UK	United Kingdom
URL	Uniform Resource Locator (address of specific website or file on the internet)
USA	United States of America

USB	Universal Series Bus (cable system)
UTC	Co-ordinated Universal Time
V	Volts
VOR	Voice Operated Recording
Vrms	Root-mean-square Voltage
W	Watts
WiFi	Wireless local area network

1. About This Manual

This manual contains the information required for the installation and operation of the Timespace Technology X300 Digital Video Recorder (DVR).

1.1   X300 models – identification and distinction

The original X300 DVR (Mark 1) was the X300 Mark 1. The X300 Mark 2 was introduced from January 2016. At the date of issue of this manual, Timespace is manufacturing two versions of the X300 DVR – the X300 Mark 2 (4-channel) and the X300-16M (16 channels).   See Figure 1 - X300 models/dates of manufacture below for a summary of the model numbers and dates:

Model number	Dates of manufacture
X300 (Mark 1)	2010 – January 2016
X300 Mark 2	January 2016 – present
X300-16M	August 2018 – present

Figure 1 - X300 models/dates of manufacture

All 3 versions of the X300 have identical front panels:

Figure 2 – X300 Front panel - all models

The various models of the X300 can be distinguished by their rear panels and labelling – see below:

X300 Identification/distinction

X300 Mark 1 rear

(2010 – January 2016)

X300 Mark 2 rear (4 channels)

(January 2016 – present)

X300-16M rear (16 channels)

(August 2018 – present)

Figure 3 – X300 Identification / distinction

1.2   Applicability of this manual

This manual contains details for the X300 Mark 2 and the X300-16M.

Users with X300 Mark 1 DVR should contact Timespace for a previous version of this Technical Manual which refers to the X300 Mark 1. Contact support@tspace.co.uk or 01480 414147.

Many features are common to the X300 Mark 2 and the X300-16M. In some sections of this manual, additional/different details are relevant to the X300-16M, and this will be highlighted in relevant sections, particularly in the Menu System section.

Mechanical diagrams and installation details for the X300 Mark 2 and the X300-16M are given in the Installation chapter.

A summary of the main feature differences between the X300 and the X300-16M is below:

Feature	**X300 Mark 2**	**X300-16M**
Analogue (SD) video inputs	4	16
Video outputs	1	2
Audio inputs	2	1
Alarms in	5	10
Built in camera power/connector	No	Yes (Molex)
Built-in GSensor	No	Yes
Supports Bridge Alert	No	No
Supports CANLink	Yes	Yes

Figure 4 - X300 Models - features and differences

1.3   X300 naming terminology

Where the generic term "X300" is used in this manual, this refers to all versions of the X300 DVR. If a feature is specific to only one of the models, then this will be made clear by naming eg either the "X300 Mark 2" or the "X300-16M".

1.4   Structure of this manual

This manual is divided into the following sections:

- Quick Start Guide
- User Guide – X300 Menu System
- System Information and Security
- System Interfaces
- Installation Guide
- Service and Maintenance
- Software
- Appendices

Where text in the body of the manual is shown in CAPITALS, this relates to one of the menu choices in the X300 menu system.

Within the X300 User Guide section of the Manual, links from menus to other menus or sub-menus are given as hyperlinks.

Detailed technical information can be found in the Appendices, along with certificates of conformity and type approval.

Recorded files can be viewed using PCLink200, Timespace's proprietary reading and archiving software package. Detailed information on viewing the recorded files is found in the manual for PCLink200.

2. Quick Start Guide

2.1 System Overview

X300 DIGITAL VIDEO/AUDIO RECORDING SYSTEM

X300 DIGITAL VIDEO / AUDIO RECORDER

REMOVABLE, SHOCK MOUNTED
HARD DISK CARTRIDGE

REMOVABLE SD CARD FOR DUAL
RECORDING & DOWNLOAD (OPTIONAL)

X300 with X301 REVIEWER / PROGRAMMER

Figure 5 X300 Digital Video/Audio Recorder

2.1.1   X300 Digital Video/Audio Recording System

The X300 is a digital video/audio surveillance recorder for use in covert, portable and mobile applications.

Recordings are made on a removable hard disk cartridge inserted in the X300. Optionally, recordings can be simultaneously written to a removable SD card.

The recordings can be accessed by connecting the cartridge to a PC using Timespace USB interface kit or cartridge station. Timespace PCLink application is a proprietary reading and archiving software package used to review the recordings.

The X301 Reviewer is used to program the menu settings on the X300, check camera views, review footage and list the recorded files on the installed Hard Disk Cartridge. Recording can continue during this reviewing process.

2.1.2   Programming – X301 Reviewer

The X300 is configured using a tiered menu system. The menu system is accessed using the Timespace X301 Reviewer (pictured below).

Figure 6 X300 connected to X301 Reviewer

To enter Menu System press any of the four MENU arrow buttons.

To exit the Menu System or to move back up a level press the MENU EXIT button.

See the separate X301 Reviewer manual at http://www.tspace.co.uk/pdf/timespace-reviewer-manual.pdf for detailed information on the Reviewer's functions / controls. A separate manual for the previous model of Reviewer, the X201, is available by contacting Timespace.

2.1.3   Help Screens

 Each page on the menu system has an associated Help screen which describes the features on that page.

Pressing the HELP key on the [Reviewer](#) front panel will display the Help page. Use the UP/DOWN arrow keys to scroll through each help page.

The help pages included on the X300 are intended as a quick reference with more detailed descriptions contained in this X300 Manual.

3. User Guide – X300 Menu System

The X300 is configured using a tiered menu system. The menu system is accessed using the Reviewer. There are two top level menus through which all features and settings are configured.

The MAIN MENU relates to the recording functions, files and video output:

The SETTINGS MENU is where the X300 and any connected equipment are configured:
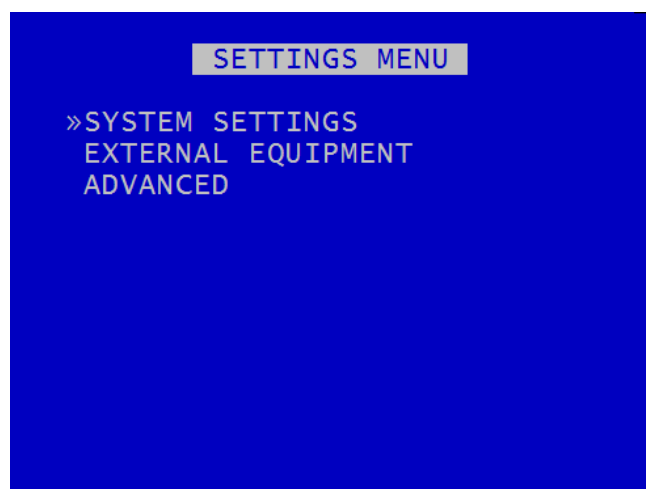
NB: Each menu, feature and setting is detailed in the following pages. Refer to the Table of Contents for reference to specific features, functions and settings.

A help system is included and can be displayed for each menu by pressing the HELP key on the [Reviewer](#).

Navigation of the menu system is by using the arrow keys on the [Reviewer](#).

All menu configuration items are changed instantly with the exception of the following which require a reboot:

- [VIDEO STANDARD](#) – switching between PAL/NTSC.
- BAUD RATE – changing the baud rate for GPS, [GSensor](#) and RS232.
- [LANGUAGE FILE](#) – when loading a language file from the hard disk cartridge.

3.1   Main Menu

```
            MAIN MENU
  »NORMAL RECORDING
   TIMER RECORDING
   ALARM RECORDING
   SD RECORDING
   SHOT RECORDING
   MOTION DETECTION
   AUDIO RECORDING
   RECORDED FILES
   VIDEO OUTPUT


   SETTINGS MENU
```

Recording modes in order of priority are:

1) SHOT RECORDING
2) ALARM RECORDING
3) TIMER RECORDING
4) NORMAL RECORDING

SD RECORDING can be running in parallel to any of the above recording modes.

MOTION DETECTION is used as a trigger to start one of the recording modes - it is not a recording mode on its own.

> **HINT:** A MANUAL OVERRIDE feature exists. If the DVR is recording from a configured recording setting, eg TIMER RECORDING or ALARM RECORDING, and a user attempts to stop recording (by pressing the REC button on the Reviewer or on the X300 front panel), a warning message will be displayed. "MANUAL OVERRIDE ENABLED". To disable MANUAL OVERRIDE, press the record key again. To cancel the action, press the MENU EXIT key.

Audio recording can be turned on or off for all recording modes. This selection is found on the AUDIO RECORDING menu where other specific audio settings can be configured.

> **NB**: Across the different recording modes, the X300 has some common settings, e.g. Images per Second (IPS). The IPS can be configured from 1 to 25 per camera. To save duplication, these options will only be documented in the first instance and subsequent features should be assumed to be the same unless explicitly stated.

3.1.1   Normal Recording

This menu sets the Normal recording configuration. Recording is activated by pressing the record button on the front of the X300 or the Reviewer.

The X300 has 4 camera inputs, and the X300-16M has 16 camera inputs. The different number of cameras will therefore be shown for each model:

X300 Mark 2 Normal Recording Menu	X300-16M Normal Recording Menu

Other than the number of cameras available, camera set-up are the same for the X300 and the X300-16M. This also applies for other recording modes, eg TIMER RECORDING, ALARM RECORDING, SD RECORDING.

Connected cameras are identified by highlighting the relevant camera number with either a red background (indicating camera recording) or a white background (camera present but not recording).

Images per second IPS (**RATE**) and quality **(QUAL)** can be set individually for each camera.

RATE can be set to; "-" (OFF), 0.1, 0.5, 1, 1.5, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12.5, 15, 20, 25, SUPD1 (50IPS). The global (total) IPS limit on the X300 is 200 IPS.

QUAL can be set to; LOW, MEDIUM, HIGH, V.HIGH, VV.HIGH, SUPER and SUPD1

> **NB**: SUPD1 uses DOUBLE the images per second due to recording in interlaced mode (both fields). Therefore if 4 cameras were setup at 5IPS each, but one was SUPD1 RES, then the total IPS used would be 25.

If AUDIO is required during NORMAL RECORDING, this must be set up separately in the AUDIO RECORDING menu.

REC SPECIFIED CAMS - This sets the X300 to record the cameras in the manner specified. The alternative setting is **REC CONNECTED CAMS** which would only record the cameras that the X300 has detected as being connected. This allows the X300 to be configured with recording RATE and QUAL prior to cameras being installed, and then t o be deployed with cameras without reconfiguring the menu, just plug & play.

3.1.1.1   Global (total) IPS limit

The global (total) recording resource available on the X300 is 200IPS.

For each recording mode, the total number of configured IPS (images/sec) is displayed along with the maximum. Any adjustment to the camera IPS, image quality or number of recorded cameras will affect the REC TIME. The REC TIME is an indication of the number of Days, Hours, Minutes that the X300 will record for based upon the current settings and entire installed cartridge capacity.

HINT: A "copy down" feature is available for configuring multiple camera settings. The settings for the currently selected camera will be copied down to all remaining cameras, subject to the global IPS limit. Press 0 to copy down.

By default all cameras are set to record in NORMAL RECORD mode, enabling quick deployment - just connect cameras and press the record button.

NB: the X300 is set to default record at power up. Options to enable/disable recording at power-up are found in the SETTINGS > ADVANCED menu POWER STATE.

3.1.2   Timer Recording

```
          TIMER RECORDING                            TIMER RECORDING
   CAM RATE QUAL                          CAM RATE QUAL   CAM RATE QUAL
     1»-      -                             1»-      -      9 -      -
     2 -      -                             2 -      -     10 -      -
     3 -      -                             3 -      -     11 -      -
     4 -      -                             4 -      -     12 -      -
                                            5 -      -     13 -      -
                                            6 -      -     14 -      -
                                            7 -      -     15 -      -
                                            8 -      -     16 -      -
   PRESS 0 TO COPY DOWN REC PRESENT    PRESS 0 TO COPY DOWN REC PRESENT
   WHEN TIMER STOPS:  STOP REC.        WHEN TIMER STOPS:  STOP REC.
   REC SPECIFIED CAMS  REC SCHEDULE    REC SPECIFIED CAMS  REC SCHEDULE
   TOTAL IPS:   0.0 OF 200.0           TOTAL IPS:   0.0 OF 200.0
```
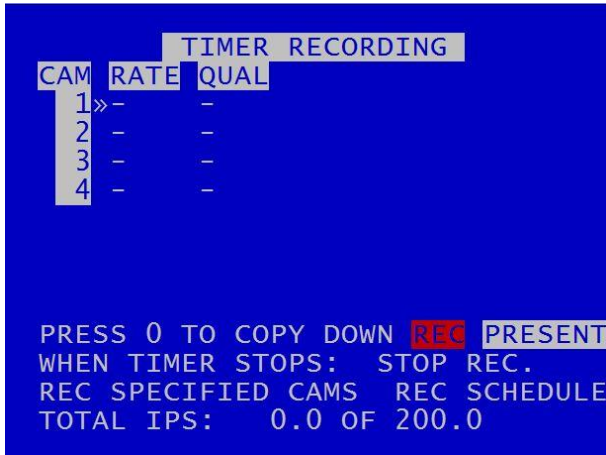
X300 Mark 2 Timer Recording Menu   **X300-16M Timer Recording Menu**

Daily on/off timers can be set to provide timed recording. This menu sets the recording configuration and times. During TIMER RECORDING the settings in this menu apply.

Images per second (**RATE**) and quality **(QUAL)** can be set individually for each camera in the same way as for NORMAL RECORDING.

If AUDIO is required during TIMER RECORDING, this must be set up separately in the AUDIO RECORDING menu.

WHEN TIMER STOPS: At the end of a period of TIMER RECORDING the X300 can either STOP RECORDING or record in NORMAL RECORDING mode. The latter can be used if two recording styles are required based on time.

REC SPECIFIED CAMS - This sets the X300 to record the cameras in the manner specified. The alternative setting is **REC CONNECTED CAMS** which would only record the cameras that the X300 has detected as being connected. This allows the X300 to be configured with recording RATE and QUAL prior to cameras being installed, and then t o be deployed with cameras without reconfiguring the menu, just plug & play.

Enter the daily start and end times in the RECORDING SCHEDULE .

NB: ensure cameras have been configured for TIMER RECORDING or no footage will be recorded during times set in the RECORDING SCHEDULE.

TOTAL IPS – provides details of current IPS as configured within TIMER RECORDING, as well as the total IPS available.

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3.1.2.1   Recording Schedule

```
        RECORDING SCHEDULE

»DAILY TIMER DISABLED
 MON  09:00 TO  17:00   COPY
 TUE  09:00 TO  17:00   DOWN
 WED  09:00 TO  17:00
 THU  09:00 TO  17:00
 FRI  09:00 TO  17:00
 SAT  00:00 TO  00:00
 SUN  00:00 TO  00:00

 PERIOD TIMER DISABLED
 FROM: 00:00    00/00/00
 TO:   00:00    00/00/00
```

A schedule of recording times can be set. This can be used e.g. to record between a start date and end date. If both DAILY TIMES and PERIOD TIMES are selected, the X300 will record only in the period and also only in the daily times shown.

DAILY TIMER DISABLED – disables timer recording.

RECORD OUTSIDE DAILY TIMES – sets the unit to record at all times other than those specified in the daily times schedule.

RECORD BETWEEN DAILY TIMES – sets the unit to record between the daily times specified in the schedule.

A COPY DOWN features is available to copy the times set for Monday on to all other days of the week.

A period of TIMER RECORDING can be set e.g. to record between a start date and end date. Options for this are PERIOD TIMER DISABLED, RECORD INSIDE PERIOD, RECORD OUTSIDE PERIOD.

NB: By default the TIMER SCHEDULE is set to Mon-Fri 9-5 and all day Sat/Sun. Selecting RECORD OUTSIDE DAILY TIMES will give a quick outside-office-hours style recording.

HINT: Times are entered in the RECORDING SCHEDULE using the digit keys on the front panel of the Reviewer for number input.

3.1.3   Alarm Recording

```
        ALARM RECORDING                       ALARM RECORDING
CAM RATE QUAL                         CAM RATE QUAL   CAM RATE QUAL
  1»25   HIGH                           1»10   HIGH     9 10   HIGH
  2 25   HIGH                           2 10   HIGH    10 10   HIGH
  3 25   HIGH                           3 10   HIGH    11 10   HIGH
  4 -    -                              4 10   HIGH    12 10   HIGH
                                        5 10   HIGH    13 10   HIGH
                                        6 10   HIGH    14 10   HIGH
                                        7 10   HIGH    15 10   HIGH
                                        8 10   HIGH    16 10   HIGH
PRESS 0 TO COPY DOWN REC PRESENT      PRESS 0 TO COPY DOWN REC PRESENT
PRE-ALARM RECORDING...                PRE-ALARM RECORDING...
ALARM I/O MENU                        ALARM I/O MENU
TOTAL IPS:  75.0 OF 200.0             TOTAL IPS: 160.0 OF 200.0
```

        X300 Mark 2 Alarm Recording Menu   **X300-16M Alarm Recording Menu**

Alarm recording is activated by the alarm inputs. This menu sets the alarm recording configuration.

Alarm recording can be triggered by setting the function one or more ALARM INPUTS to be ALARM REC. ALARM INPUTS can also be used to trigger other functions and modes of recording.

PRE-ALARM RECORDING – configures the DVR to capture and retain a period of recording prior to an alarm input being triggered.

ALARM I/O menu – configures Alarm Recording and INPUT / OUTPUT options.

TOTAL IPS – provides details of current IPS allocation within ALARM RECORDING, as well as the total IPS available for ALARM RECORDING.

3.1.3.1   Pre-Alarm Recording (PAR)

```
        ┌──────────────────────────┐
        │   PRE-ALARM RECORDING     │
        └──────────────────────────┘

        PAR ENABLED:           »NO
        PAR KEEP TIME:          1 MIN

        Note:
        Pre-Alarm Recording (PAR) has
        higher priority than Timer and
        Normal recording (even when
        these modes are triggered by
        alarm input).
```
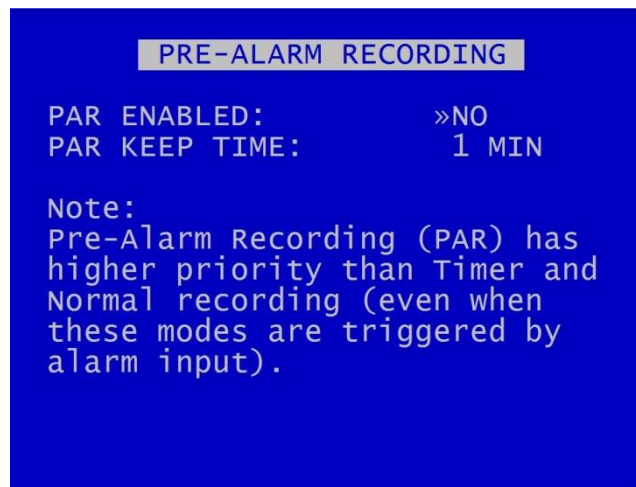
Pre-Alarm Recording (PAR), if enabled, configures the DVR to record, and to keep the recorded files for a set period of time prior to an alarm input being triggered. This is useful in order to ensure that the lead-up to an alarm event is recorded. It maximises the amount of available hard disk space by only keeping the required files from the lead-up to an alarm event.

PAR ENABLED – to allow PRE-ALARM RECORDING, select YES. To disable PAR, select NO.

PAR KEEP TIME – select the length of pre-alarm footage which you wish to retain on the disk. Options are 1MIN, 2, 3, 4, 5, 10, 20, 30, 40, 50MINS, 1HOUR, UNLIMITED.

The DVR will record all cameras specified for ALARM RECORDING for the duration specified in the PAR KEEP TIME setting. The DVR will be recording continuously, but will only keep the recordings for the specified time.

NB: Pre-Alarm Recording has higher priority than TIMER RECORDING and NORMAL RECORDING (even when these modes are triggered by an alarm input).

3.1.3.2   Alarm Inputs/Outputs

```
        ALARM I/O MENU

»ALARM  INPUTS
 ALARM  OUTPUT / LEDs
 ALARM  CAMERA CYCLER

 ALARM  INPUT ALARM FILE
 ALARM  INPUT HOLD-OFF
 ALARM  INPUT POST DELAY

 PRE-TRIG WRITE PROTECT: OFF
 POST-TRIGGER RECORDING: OFF
 ANALOG INPUT HYSTERESIS: 2V
```
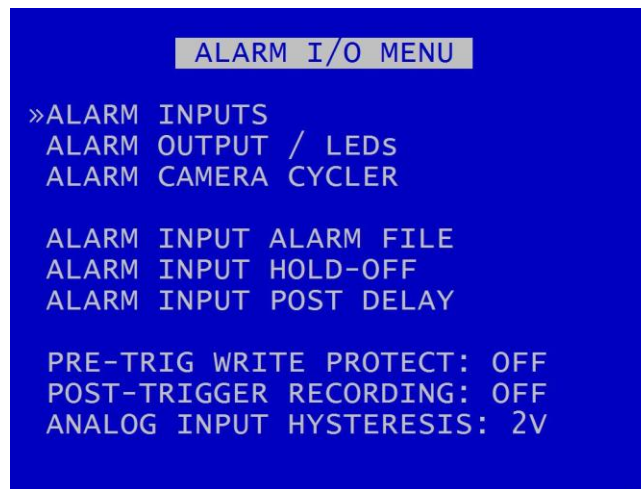
ALARM INPUTS menu sets the active/inactive status of each alarm input and defines the function (action) of the X300 when the selected alarm is active.

ALARM OUTPUTS/LEDs menu sets the conditions for the Alarm Outputs.

ALARM CAMERA CYCLER menu configures the options for the X300 to automatically switch between cameras and the Health Page.

ALARM INPUT ALARM FILE – provides an option for files to be marked as "ALARM" recordings, see link for further details.

ALARM INPUT HOLD-OFF – controls the number of seconds for which ALARM RECORDING is delayed after an alarm has triggered.

ALARM INPUT POST DELAY controls the number of seconds for which the alarm state is held once the alarm input has changed state.

PRE-TRIG WRITE PROTECT specifies the duration prior to the alarm recording for which files will be marked as write protected. This assumes that another mode of recording was already writing files to disk.

POST TRIGGER RECORDING specifies the duration of recording after the alarm trigger. Once post trigger has elapsed, recording will stop or return to the previous recording mode.

PRE and POST TRIGGER options will only function with ALARM recording mode.

ANALOG INPUT HYSTERESIS – specifies the voltage value difference that must occur in order to change the alarm state e.g. if the trigger is set to 14V, when 14V is met the trigger will switch. In order to switch back, a change of 2V must occur i.e. 14-2 = 12V. Available values are 1V, 2, 3,4, 5, 6, 7 and 8V.

> The X300 Mark 2 has 5 alarm inputs and 3 outputs on the DIN pin and the rear panel screw terminal block – see Figure 12 - X300 Mark 2 Rear Panel and Figure 13 - X300 Mark 2 Audio Connector.
>
> The X300-16M has 10 alarm inputs and 3 outputs on the rear panel screw terminal and Molex connectors – see Figure 14 - X300-16M Rear Panel and Figure 15 - X300-16M Rear Connections.

3.1.3.3   Alarm Inputs

```
          ALARM INPUTS                          ALARM INPUTS
 IN ACTIVE FUNCTION      CAMS         IN ACTIVE FUNCTION      CAMS
 1 »> 6V     IGNITION               1 »> 12V    NONE
 2  > 6V     ALARM REC    1 TO  3   2  > 12V    NONE
 3  > 6V     NONE                   3  > 12V    NONE
 4  > 6V     NONE                   4  > 12V    NONE
 5  > 6V     NONE                   5  > 12V    NONE
                                    6  > 12V    NONE
                                    7  > 12V    NONE
                                    8  > 12V    NONE
                                    9  > 12V    NONE
                                    10 > 12V    NONE
 EMBED ALARM STATE MENU...          EMBED ALARM STATE MENU...
 ALARM 1: INACTIVE                  ALARM 1: INACTIVE
```

      X300 Mark 2 Alarm Inputs Menu   **X300-16M Alarm Inputs Menu**

The X300 has 5 alarm inputs, and the X300-16M has 10 alarm inputs, so the ALARM INPUT menus appear different as shown.

ALARM INPUTS menu sets the alarm inputs to be ACTIVE or INACTIVE. If an alarm input number is highlighted with a white background, this indicates its current state is active. No highlight indicates the state is inactive.

Use the left and right menu buttons on the Reviewer to set the active voltage. For a 24V vehicle system, use typically <12V or >12V. For a 12V vehicles system, use typically <6V or >6V.

> **NB**: There is a priority order on the Alarm Inputs. The lower numbered Alarm Inputs take priority over the higher numbers. For example, if Alarm Input one is wired to the Reversing sensor, and is set to to trigger NORMAL RECORDING when the Reversing sensor is activated, this alarm will take priority over any other alarm currently triggered.

The FUNCTION defines the action of the X300 when the selected alarm input is active. The function is active for the duration of the alarm (plus post trigger time if selected):

ALARM INPUT FUNCTIONS

NONE   -   No action
NORM REC   -   Switches NORMAL RECORDING on
ALARM REC   -   Switches ALARM RECORDING on.
SHOT RECORDING   -   Switches SHOT RECORDING on.
SWITCHER   -   Sets the Video Switcher (MAIN VIDEO OUT) to the selected camera.
SWITCHER 2   -   Sets the Video Switcher2 (AUX VIDEO OUT) to the selected camera.
(X300-16M only)
TIMER REC   -   Switches TIMER RECORDING on
SMS MSG   -   Send one of the six user defined SMS text messages (GSM modem
                            required).
HEALTH PAGE   -   Displays the DVR HEALTH PAGE.
PTZ PRESET   -   Accesses the PTZ preset camera positions. 8 presets are available (setup
                            using the PTZ menu) and a trigger can be used to invoke that position upon
                            Alarm State change.
IGNITION   -   Linked to POWER OPTIONS menu to control how the X300 behaves on
                            ignition
INDICATOR L etc   -   Various vehicle alarm inputs - tags the particular alarm inputs as used for:
                            INDICATOR L, INDICATOR R, BRAKE, SIDE LIGHTS, HEAD LIGHTS, FOG LIGHTS,
                            HORN, BULL HORN, SIREN, BLUES, HAZARD WARN, DOOR, REVERSE,
                            HANDBRAKE, ACCEL'TION
MOTION NORM   -   activates Motion Detection in conjunction with an alarm event
CAM CYCLER   -   Automatically switches between cameras and the HEALTH PAGE as
                            configured in the ALARM CAMERA CYCLER menu from the ALARM I/O menu
                            page.
MULTIVIEW   -   Sets the main switcher to Multi Camera view (12/16 camera models)
IMG -> EMAIL   -   Initiates the X300 to email a snapshot of the specified camera. See the
                             SMTP SERVER menu for email configuration.
POWER DOWN   -   Instructs the DVR unit to power down when the alarm is triggered
DOOR 1-3   -   tags the alarm inputs as used for doors
RAMP   -   tags the alarm inputs as used for the ramp
PUSHBUTTON1 & 2   -   tags the alarm inputs as used for additional buttons/triggers specified by
                             the user

3.1.3.4   Embed Alarm Input State

```
    EMBED  ALARM  INPUT  STATE

ALARM IN    EMBED          TEXT
    1       »NO         ALARM 1
    2        NO         ALARM 2
    3        NO         ALARM 3
    4        NO         ALARM 4
    5        NO         ALARM 5




POSITION:    TOP
```

```
    EMBED  ALARM  INPUT  STATE

ALARM IN    EMBED          TEXT
    1       »YES        ALARM 1
    2        NO         ALARM 2
    3        NO         ALARM 3
    4        NO         ALARM 4
    5        NO         ALARM 5
    6        NO         ALARM 6
    7        NO         ALARM 7
    8        NO         ALARM 8
    9        NO         ALARM 9
   10        NO         ALARM 10
POSITION:    TOP
```

X300 Mark 2 Embed Alarm Inputs Menu   **X300-16M Embed Alarm Inputs Menu**

The EMBED ALARM INPUT STATE menu configures options for embedding text into recorded images.

8 user-defined characters can be entered per alarm input and positioned either top or bottom of the image. The text will display on the footage for the duration of the alarm, plus any post-alarm duration.

The default text is the number of each alarm, eg ALARM 1, ALARM 2 etc.

POSITION – select TOP or BOTTOM

Text is entered using the Text and Number Input keys on the Reviewer.

The text will be embedded on all camera views simultaneously and will appear on all selected cameras during playback in PCLink.

3.1.3.5   Alarm Output/LEDs

This menu sets the conditions for the Alarm outputs. This determines whether the X300 alarm output goes closed or open when any of the set conditions are met. The X300 has three outputs; LED1 (LD1), LED2 (LD2) and ALARM OUT (ALM).

ALARM OUTPUT CLOSED/OPEN WHEN…

TEST OPEN/CLOSED	-	Sets the input to OPEN/CLOSED for testing purposes.
ALARM OCCURRED	-	An ALARM event has occurred.
RECORD LED	-	The front panel record LED is active.
DISK LED	-	The front panel disk LED is active
SD RECORDING	-	SD recording is occurring
FAIL LED	-	The front panel fail LED is active
SERVICE LED	-	The front panel service LED is active
FRONT LEDS	-	Any of the front panel LEDs are active
CAM DISCONNECTED	-	Any camera is disconnected
GSENSOR TRIGGER	-	Any of the XP200 GSensor configured thresholds are reached / exceeded.
LAN ACTIVE	-	Files are being transferred via the LAN interface
HD WP %	-	A percentage of the hard disk cartridge contains Write Protected files: 25, 50, 60, 70, 80, 90 and 99%.
HD FULL %	-	A percentage of the hard disk cartridge if full; 25, 50, 60, 70, 80, 90 and 99%.

AUDIO VOR		Voice Operated Recording. If the detected level of audio input reaches a certain percentage (25%, 50%, 75%) the alarm output can be triggered (using ALARM OUTPUT **3**). If using this trigger as an alarm *input*, a wire link will need to be in place on the X300 rear panel (see Figure 12 - X300 Mark 2 Rear Panel - Connections for wiring pinout).
	-	If the VOR output is being used as an alarm input to trigger recording, it can only be used to trigger ALARM recording mode. Example setup of VOR;

1. ALARM OUTPUT: ALM, CLOSED, AUDIO VOR 75%
2. ALARM INPUT: LD1, CLOSED, FUNCTION – ALARM REC, CAMS 1

		The above example assumes that there is a wire link on the green block between ALARM OUT and ALARM IN1. The POST TRIGGER time can also be set to record for x seconds after the audio trigger has finished.
MOTION DETECTED	-	Motion is detected
GPS SPEED ALARM	-	GPS has detected speed above a certain designated threshold. Configure this in the GPS menu.

CURRENT STATE – Describes how each alarm output is CLOSED (highlighted white) or OPEN (no highlight) (CLOSED showing alarm terminals are connected; OPEN showing alarm terminals are not connected).

3.1.3.6   Alarm Camera Cycler
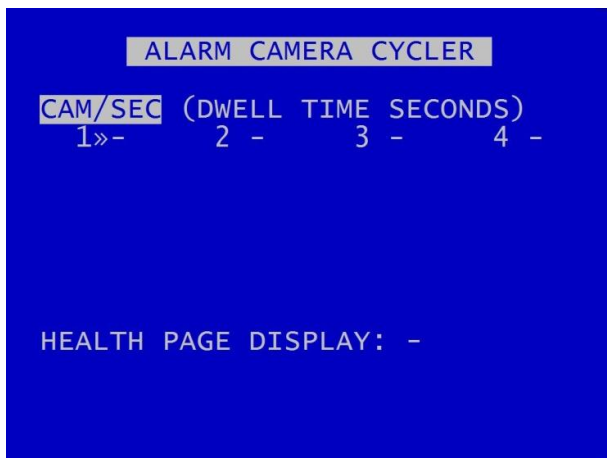
         X300 Mark 2 Alarm Camera Cycler Menu   **X300-16M Alarm Camera Cycler Menu**

The ALARM CAMERA CYCLER function can be used as a test/auditing function to cycle through the cameras and HEALTH PAGE.

Set the ALARM input function and attach an external trigger then setup how many seconds the CAMERA CYCLER ALARM function will dwell on each camera and HEALTH PAGE before returning to the SWITCHER function. Available values are 1, 2, 3, 4, 5, 10, 20, 30 seconds.

HEALTH PAGE DISPLAY – sets the number of seconds for which the camera cycler shows the HEALTH PAGE in the Camera Cycler cycle.   Available values are 1, 2, 3, 4, 5s, 10s, 20s and 30 seconds.

3.1.3.7   Alarm Input Alarm File

```
   ALARM INPUT ALARM FILE          ALARM INPUT ALARM FILE

IN ALARM FILE                   IN ALARM FILE
1  »NO                          1  »NO
2   NO                          2   NO
3   NO                          3   NO
4   NO                          4   NO
5   NO                          5   NO
                                6   NO
                                7   NO
                                8   NO
                                9   NO
                                10  NO
```

X300 Mark 2 Alarm Input Alarm File Menu   **X300-16M Alarm Input Alarm File Menu**

The Alarm Input Alarm File feature provides an option for files to be marked as alarm event files if recording in any recording mode, ie not just in ALARM RECORDING.

If any of the above numbered ALARM FILES are set to YES, then the current recording file will be marked as an ALARM recording if that numbered alarm is active.

> **NB**: The currently configured recording mode (i.e. NORMAL, TIMER, etc) will not change.   The alarm event will simply be marked as an alarm event file. This will make the alarm event easier to identify when finding files on the HDD or viewing in PCLink.

An example scenario where ALARM INPUT ALARM FILE may be useful:

A fire engine has a DVR which is configured for NORMAL RECORDING (Note: no ALARM INPUT FUNCTIONS have been configured for NORMAL or ALARM RECORDING).

ALARM INPUT 3 has been configured for SIREN, and ALARM INPUT ALARM FILE 3 has been set to YES.

When the SIREN becomes active, this triggers ALARM 3. Note: the recording mode does not change, and NORMAL RECORDING continues as per prior to the alarm trigger.

On file close, the recording file is marked as an alarm event file (A). All subsequent files created when the alarm is active are marked as ALARM files at file creation.

3.1.3.8   Alarm Input Hold-off
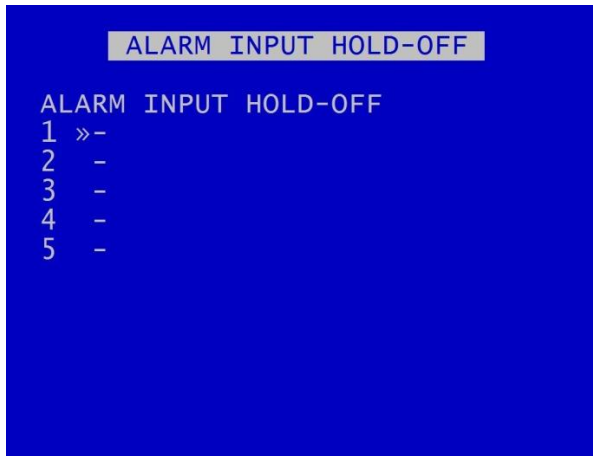
X300 Mark 2 Alarm Input Hold-Off Menu   **X300-16M Alarm Input Hold-Off Menu**

The ALARM INPUT HOLD-OFF controls the number of seconds for which reporting of an active alarm state is delayed after an alarm has triggered to the active state.

For each Alarm Input, select a hold off value from 1-60SEC.

This may be useful in scenarios where accidental or very short-term action would otherwise trigger an alarm. In these cases, the user may not wish the alarm to be triggered, or the alarm event to be marked in the RECORDED FILES.

Examples of scenarios where ALARM INPUT HOLD-OFF may be useful:

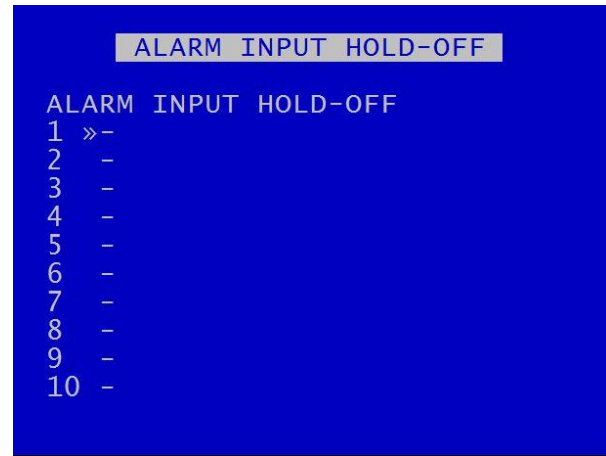1. A camera is recording activity at the rear door of a retail premises. The door is alarmed and the DVR configured to begin ALARM RECORDING if the door is open. The user may decide to implement an ALARM HOLD-OFF period so that ALARM RECORDING does not begin until the door has been open for eg 3 seconds – thus avoiding recording whenever a staff member opens the door accidentally, but ensuring that recording takes place whenever the door is held open for a delivery.

2. A waste disposal truck has a DVR which is configured to trigger ALARM RECORDING whenever reverse gear is engaged. This is to ensure that managers can view all reversing footage and check that drivers are complying with the reversing speed limit. The user may choose to set an ALARM INPUT HOLD-OFF for eg 2 seconds in order to avoid triggering ALARM RECORDING when the driver accidentally engages reverse gear without actually moving the vehicle.

3.1.3.9   Alarm Input Post Delay

```
  ALARM INPUT POST DELAY           ALARM INPUT POST DELAY
IN DELAY                         IN DELAY
1 »-                             1  »-
2  -                             2   -
3  -                             3   -
4  -                             4   -
                                 5   -
                                 6   -
                                 7   -
                                 8   -
                                 9   -
                                 10  -
```
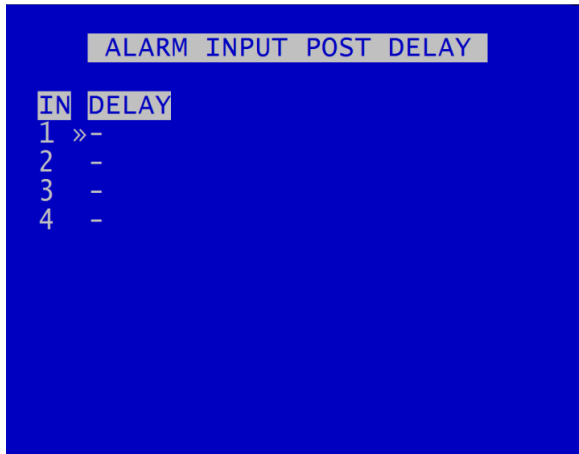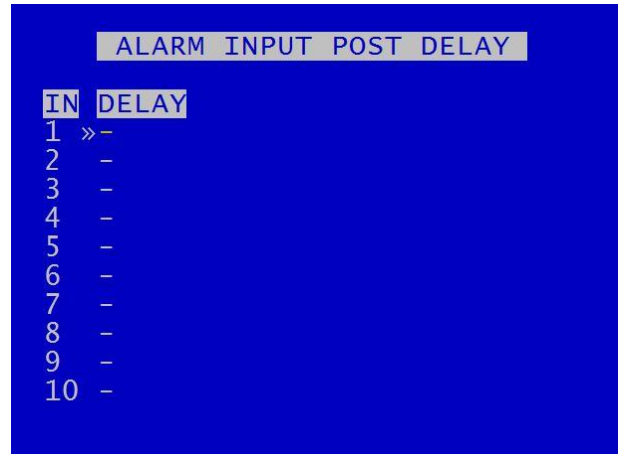
X300 Mark 2 Alarm Input Hold-Off Menu   **X300-16M Alarm Input Hold-Off Menu**

ALARM INPUT POST DELAY menu controls the number of seconds for which the alarm state is held once the alarm input has changed state.

Available values are 0.5SEC, 1, 2, 3, 4, 5, 10, 30SECS, 1MIN, 5MINS, 10, 15, 20MINS.

3.1.4   SD Recording

```
                    SD CARD

        STATUS: NOT PRESENT

        RECORDING ENABLE:»OFF
        LOCK OVERRIDE:    OFF
        HDD FAIL SD REC:  4 SECS

        RECORDING
        RECORDED FILES
        FILE COPY
        FILE SYSTEM
        INFO
        RESET (FORMAT)
```

The X300 supports a single SD card for two functions;

SD CARD RECORDING - The X300 can be configured to record up to 25 images per second to the SD card in addition to the primary images per second being recorded to the cartridge. All additional data for example Audio and GPS are also included within the SD recorded files.

FILE COPY - Files that are recorded on the X300 cartridge can be selected and copied to the SD card for review on a PC.

STATUS – shows the current Status of the SD card i.e. PRESENT, NOT PRESENT or RECORDING TO SD.

RECORDING ENABLE lists the available modes of recording for the SD card.

- OFF   – SD recording is OFF, no SD recording.
- ON   – SD recording onto SD card all the time.
- IF NORMAL REC– SD recording only occurs if the X300 is recording in Normal mode.
- IF TIMER REC   – SD recording only occurs if the X300 is recording in Timer mode.
- IF ALARM REC   – SD recording only occurs if the X300 is recording in Alarm mode.

LOCK OVERRIDE can be used to override the physical lock status of the SD card. For example if an SD card is inserted with the lock enabled, this usually prevents any data being written, however the X300 can override this.

HDD FAIL SD REC – sets the number of seconds for which the SD card will record once a Hard Disk write fault has been detected (before the X300 reboots in order to re-try the HDD).

[RECORDING](#) menu configures the SD card recording setup.

[RECORDED FILES](#) menu displays a list of the files on the SD card.

[FILE COPY](#) menu is used when copying files from the X300 cartridge to the SD card.

[FILE SYSTEM](#) menu configures options for recording on the SD card.

[INFO](#) page includes details such as; Size, % used, SD serial number etc.

[RESET](#) gives options for deleting files on the SD card .

3.1.4.1   SD Card Recording

X300 Mark 2 SD Recording Menu   **X300-16M SD Recording Menu**

The X300 can be configured to record up to 25 images per second to the SD card (regardless of PAL/NTSC video standard) in addition to the primary images per second being recorded to the hard-disk cartridge.

 All additional data for example Audio and GPS are also included within the SD recorded files.

Images per second can be set independently per channel, however the Quality (QUAL) is set automatically based on the X300's primary mode of recording. e.g. if the X300 is NORMAL RECORDING with a QUAL of SUPER, the SD RECORDING files will also be SUPER.

If the X300 changes mode, for example from NORMAL RECORDING to ALARM RECORDING, and the QUAL is set differently in NORMAL and ALARM, the SD files will follow the change and record the QUAL of ALARM RECORDING for the period it is active.

NB: SD Card Recording is allocated up to 25 IPS from the global IPS limit. Cameras configured for SD recording cannot therefore exceed a total of 25IPS.

3.1.4.2   SD Card Recorded Files

```
     ┌─────────────────────────────┐
     │    SD CARD RECORDED FILES    │
     FIRST / LAST PAGE
     PAGE  1  OF  5
     W__GA FILTER OFF          SIZE MB
     _____ 11:32:28 26/07/16 31.7
     _____ 11:32:24 26/07/16 3.3
     _____ 11:30:38 26/07/16 28.9
     W____ 11:28:36 26/07/16 3.1
     W____ 11:50:00 21/06/16 296.1
     _____ 11:40:00 21/06/16 387.9
     _____ 11:30:00 21/06/16 387.9
     _____ 11:20:00 21/06/16 387.8
    »W____ 11:10:00 21/06/16 387.9
     _____ 11:00:00 21/06/16 387.8
```

The SD CARD RECORDED FILES menu lists the files recorded on the SD card.

The files cannot be played back on the X300, and must be viewed through PCLink.   Navigation of the file list pages are via the left/right arrow menu keys on the Reviewer when PAGE or FIRST/LAST page is highlighted.

HINT: Files can be write-protected by scrolling down to the file and pressing the left arrow key on the Reviewer, a W should appear next to the file. Pressing left again will remove the write-protect.

3.1.4.3   SD Card File Copy

```
          SD CARD FILE COPY

   SIZE  GB: 15.93  USED: 0.00 %
   AVAIL GB: 15.93  WP:   0.00 %
   FILES:    0

  »HDD RECORDED FILES...

   COPY HDD FILES TO SD CARD
   FROM:     00:00   00/00/00
   TO:       00:00   00/00/00
   FILES:    0
   SIZE GB: 0.00     COPY FILES
```

FILE COPY is used to copy recorded files from the X300 cartridge to the SD card.   A link to the main cartridge HDD files give quick access to see what is on the cartridge. Some SD statistics are given to aid in the select process e.g. size and capacity used.

Use HDD RECORDED FILES to view the files on the hard disk.

COPY HDD FILES TO SD CARD by entering the start/end date & time of the period you wish to copy and then move the cursor down to select COPY FILES.

If there is enough free capacity on the SD card, the copy will begin. Progress of the copy will be displayed as a percentage and incremental file count as each file is copied.

WARNING: If other Menu buttons on the Reviewer are pressed during the FILE COPY, the action will be aborted. It is necessary to allow the FILE COPY to finish before attempting any other Menu/programming options.

A message will be displayed on the SD CARD FILE COPY menu screen when the FILE COPY is complete.

If the period requested spans multiple files, all files are copied to the SD card for that period. Files are not cut / clipped. In the following example, all four files would be copied, even though files 1 & 4 only include a portion of the period requested;
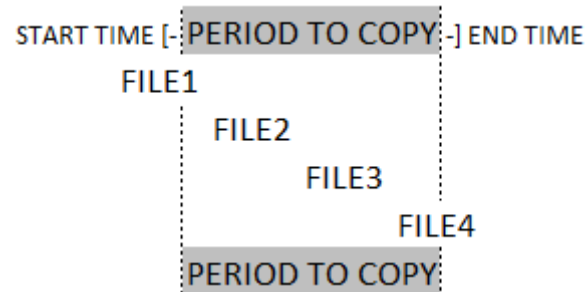
3.1.4.4   SD Card File System
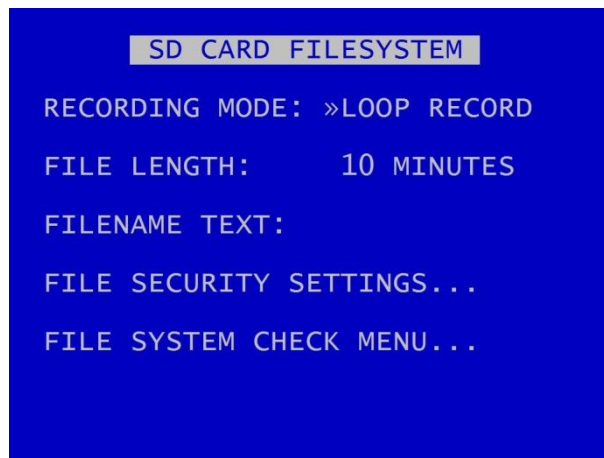
SD CARD FILE SYSTEM menu configures options for recording on the SD card.

RECORDING MODE can be set to LOOP RECORD (oldest files will be overwritten first when the hard disk cartridge is full); or SINGLE PASS recording (recording will stop when the hard disk cartridge is full).

FILE LENGTH controls how often a new file is created.   A new file is created each time recording starts. The fill will be named with the date/time when the recording started. The next file will be started as per the file length settings or when next time boundary is met.

File length options are 1MINUTE, 5MINUTES, 10MINUTES, 1HOUR. For further details refer to FILE SYSTEM menu for the main hard disk cartridge.

FILENAME TEXT - prefixes the recording files with user-defined characters . Characters can be entered using the Text and Number Input keys on the Reviewer.

FILE SECURITY SETTINGS – provides options for setting File Security (password and/or encryption) on the DVR.

FILE SYSTEM CHECK MENU configures system checking and the creation of system logs for SD CARD RECORDING.

3.1.4.5   SD Card File System Check

```
┌─────────────────────────────────────┐
│     SD CARD FILE SYSTEM CHECK         │
│                                       │
│   ON POWER SWITCH ON:                 │
│     »QUICK CHECK AND CORRECT          │
│                                       │
│   PERFORM CHECK ONLY NOW              │
│                                       │
│   PERFORM CHECK & CORRECT NOW         │
│                                       │
│                                       │
└─────────────────────────────────────┘
```
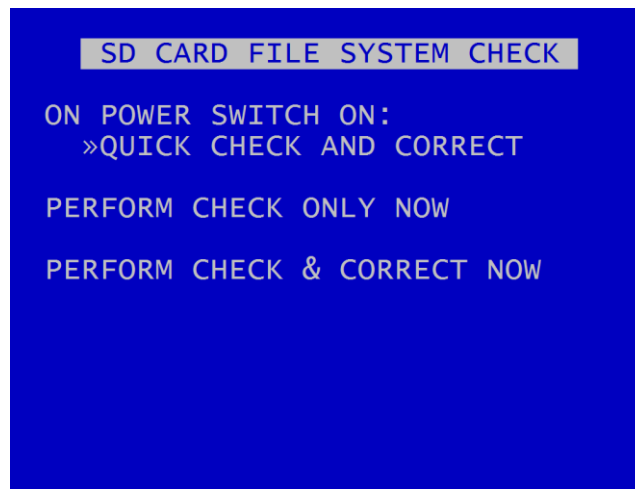
SD CARD FILE SYSTEM CHECK menu configures whether the file system is checked and/or corrected at power-up and whether a system log is created.

ON POWER SWITCH ON – options are NO CHECK, QUICK CHECK AND CORRECT, FULL CHECK AND CORRECT.

PERFORM CHECK ONLY NOW – will check the files and file system and report any errors but will not attempt to fix anything.

PERFORM CHECK & CORRECT NOW – will perform a file and file system check and fix any errors that are found.   It also rewrites the FAT and BOOT sectors.

NB: No files/data are deleted during the CHECK & CORRECT function.

3.1.4.6   SD Card Info

```
            SD CARD INFO

    -   SIZE IN GIGABYTES
    -   USED
    -   WRITE PROTECTED
    -   FILES
    -   START DATE
    -   END   DATE
    -   DAYS RECORDING

    -   CARD MANUF. ID
    -   CARD NAME
    -   CARD SERIAL NUMBER
```
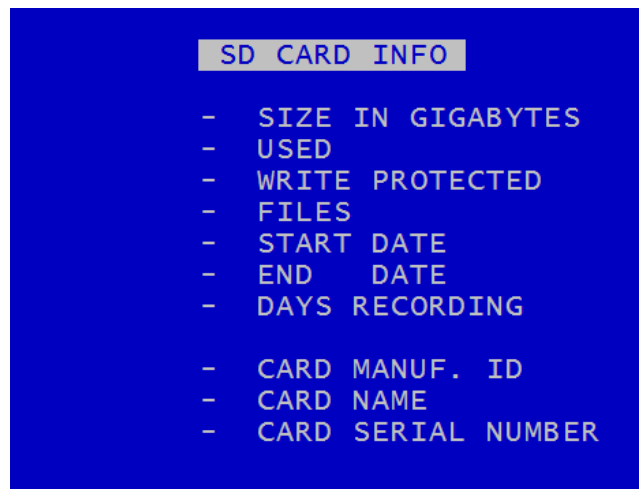
SD CARD INFO menu provides information about the use of the SD card.

- ° Size in Gigabytes
- ° Gigabytes used
- ° Write protection status
- ° Files
- ° Start date
- ° End date
- ° Days Recording
- ° Card Manufacturer ID
- ° Card Name
- ° Card Serial Number

3.1.4.7   SD Card Reset

```
         SD CARD RESET
»DELETE ALL RECORDING FILES
 SECURE CARD WIPE
```

SD CARD RESET gives 2 options for deleting files:

DELETE ALL RECORDING FILES

SECURE CARD WIPE

The DELETE ALL RECORDINGS and the SECURE DISK WIPE are the same functions found in the main RESET menu for the X300 hard disk cartridge.

3.1.4.8   Delete All SD Recording Files

```
 ┌─────────────────────────────────────┐
 │  ░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░░  │
 │  ░ DELETE ALL SD RECORDING FILES ░  │
 │                                     │
 │   WARNING:                          │
 │   THIS OPERATION DELETES            │
 │   ALL FILES ON SD CARD!             │
 │                                     │
 │   PRESS EXIT TO ABORT AT ANYTIME    │
 │   AND RETURN TO PREVIOUS MENU OR    │
 │   PRESS RIGHT MENU ARROW TO         │
 │   DELETE ALL FILES ON SD CARD: »    │
 │                                     │
 │                                     │
 └─────────────────────────────────────┘
```
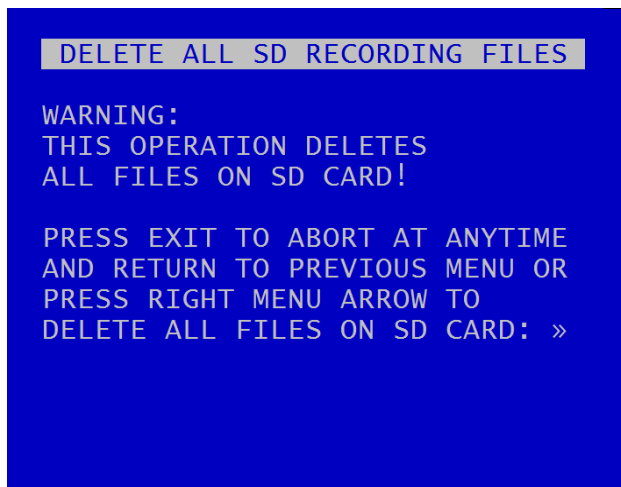
DELETE ALL RECORDING FILES will remove all recordings from the SD card, <u>including write-protected files</u>. Only do this if you want to completely remove all recordings – there is NO undo option.

Press the right menu button to go to a warning screening, press right again to carry out this action. Pressing Menu Exit will abort this procedure.

> **WARNING**: THERE IS NO "UNDO" OPTION. SELECTING "DELETE ALL FILES ON SD CARD" WILL COMPLETELY REMOVE ALL RECORDINGS ON THE SD CARD.

3.1.4.9   Secure SD Card Wipe

```
        ┌──────────────────────────────┐
        │     SECURE SD CARD WIPE      │
        │ WARNING:                     │
        │ THIS OPERATION PERMANENTLY   │
        │ DESTROYS ALL DATA ON THE CARD.│
        │                              │
        │ SECURE WIPE MAY TAKE A FEW   │
        │ HOURS DEPENDING ON CARD SIZE.│
        │                              │
        │ PRESS EXIT TO ABORT AT ANY TIME│
        │ AND RETURN TO PREVIOUS MENU OR│
        │ PRESS RIGHT MENU ARROW TO    │
        │ SECURE WIPE THE SD CARD: »   │
        │                              │
        └──────────────────────────────┘
```
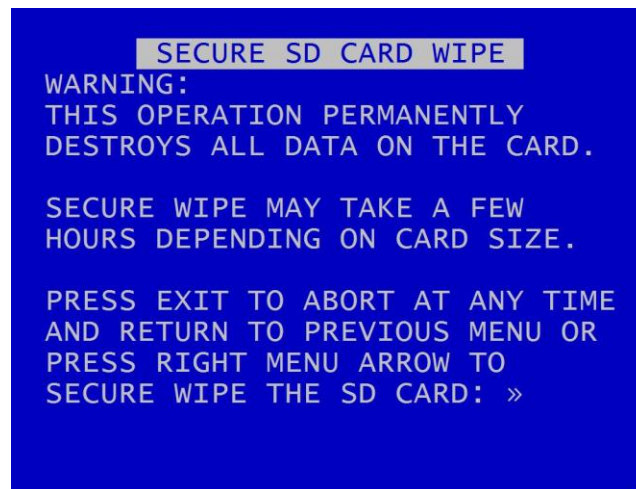
SECURE SD CARD WIPE will permanently delete all recording files on the SD card. This should only be used if files need to be completely destroyed. NO files will be able to be recovered. A final warning message will appear before this function is carried out. Pressing Menu Exit on the Reviewer will abort.

3.1.5   Shot Recording
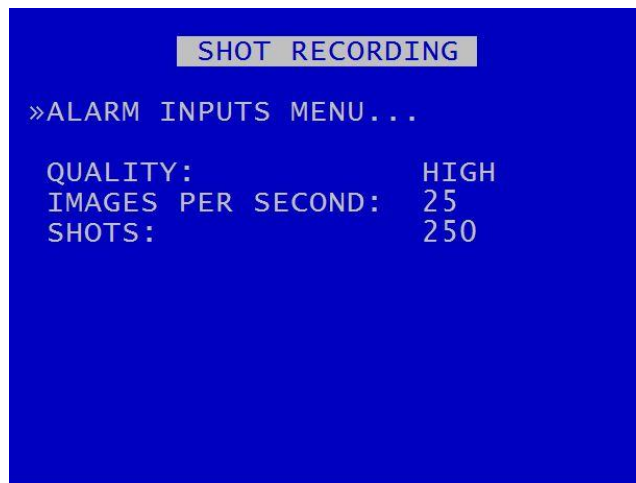
This menu controls the configuration of single/multi SHOT RECORDING.

SHOT RECORDING allows a defined number of shots (images) to be recorded from an ALARM INPUT. Shot recording occurs the instant the alarm becomes active. The duration of the alarm input signal does not affect shot recording in any way.

Set the relevant alarm input function to SHOT REC using the ALARM INPUT MENU and then select the camera that the images will be taken from.

Set the image QUALITY from available options: LOW, MED, HIGH, VHIGH, VVHIGH, SUPER, SUPD1.

Set the number of IMAGES PER SECOND required.   Available options are: 0.1, 0.5, 1, 1.5, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12.5, 15, 20, 25.

Set the number of SHOTS required. Available options are: 1,2, 3,4, 5, 8, 10, 15, 20, 25, 30, 50, 100, 150, 250.

3.1.6   Motion Detection

```
         MOTION DETECTION

»CAMERA SETUP...
 MASK VIEW/EDIT...
 DETECT VIEW...
 ARMING DELAY:          OFF
 POST-TRIG RECORDING:   5 SECS

 NORMAL RECORDING:      NO
 TIMER RECORDING:       NO
 ALARM RECORDING:       NO
 PRE-MOTION RATE RECORDING...
 SMTP MESSAGE:          NO
 SMS MESSAGE:           NONE
```

Motion Detection is used to monitor defined areas for levels of motion above a defined threshold and then to trigger the X300 recording modes; NORMAL, TIMER or ALARM.

NB: Motion Detection is used as a trigger to start of one of the recording modes; it is not a recording mode on its own.

Motion Detection is set up by using the MASK/EDIT tool to specify areas of each camera view(s) which are to be monitored for motion, and selecting the level and duration of change which must occur to produce a motion event.

When MOTION DETECTION is set up, the RECORD LED on the Reviewer will flash on and off. When motion is triggered, the LED will remain on (solid) for the duration of motion (plus any configured post-trigger time), then return to flashing.

Motion Detection Quick Set-up**:**

1.   Select the camera(s) you wish to monitor. Set these to ON in the MOTION DETECTION CAMERA SETUP menu.
2.   Also in the CAMERA SETUP menu, set the camera(s) sensitivity using PERCENTAGE and DURATION.
3.   In the MASK/EDIT menu, move/size the cursor box to select the area(s) to be monitored.
4.   Select the recording mode you wish to trigger, ie NORMAL, TIMER or ALARM in the MOTION DETECTION menu.
5.   Press record.

See the following pages for more detailed instructions for MOTION DETECTION CAMERA SETUP and using the MASK VIEW/EDIT function.

DETECT VIEW – a set-up tool, useful to show highlight motion contrast.

ARMING DELAY – is typically used to allow the operator to exit a monitored area without triggering motion detection.

POST TRIGGER RECORDING – specifies the duration of recording after motion has ended; 5seconds – 2hours.

PRE-MOTION RATE RECORDING – enables the user to configure the DVR to record at a lower IPS during non-motion periods, and to trigger recording at a higher IPS when motion is detected.

SMTP MESSAGE - If motion is detected, selecting YES here will send an SMTP Email with a camera snapshot image as per settings in the SMTP EMAIL menu in SETTINGS MENU > EXTERNAL EQUIPMENT > SMTP EMAIL.

SMS MESSAGE – On a motion detection trigger, select which SMS to be sent; 6 user defined.

3.1.6.1   Motion Detection Camera Setup

MD CAMERA SETUP	MD CAMERA SETUP
CAM DETECT PERCENTAGE DURATION 1 »OFF 0.0 0.2 SECS 2 OFF 0.0 0.2 SECS 3 OFF 0.0 0.2 SECS 4 OFF 0.0 0.2 SECS	»CAMERAS 9-16... CAM DETECT PERCENTAGE DURATION 1 OFF 0.0 0.2 SECS 2 OFF 0.0 0.2 SECS 3 OFF 0.0 0.2 SECS 4 OFF 0.0 0.2 SECS 5 OFF 0.0 0.2 SECS 6 OFF 0.0 0.2 SECS 7 OFF 0.0 0.2 SECS 8 OFF 0.0 0.2 SECS
X300 Mark 2 Motion Detection Camera Setup	**X300-16M Motion Detection Camera Setup**

CAMERA SETUP allows a selection of cameras to be monitored by the motion detection system.

Cameras that are OFF are ignored by motion detection.

PERCENTAGE is used to set the level of change that must occur between successive frames to produce a motion event.

DURATION is the time period for which consecutive motion events must occur to trigger the motion system.

> **NOTE**: Users will need to define the PERCENTAGE and DURATION as required in each individual case. The BAR GRAPH tool can assist in determining the required PERCENTAGE – see following pages.

If any individual camera is set to **OFF** in the CAMERA SETUP, it will not be controlled by MOTION DETECTION even if the record mode is set to **YES** within the MOTION DETECTION menu.

Example, if:

NORMAL RECORDING is set to record on cameras 1 – 4
NORMAL RECORDING is set to YES in MOTION DETECT MENU
Cameras 1 & 2 are set to YES in MOTION DETECT CAMERA SETUP
Cameras 3 & 4 are set to NO in MOTION DETECT CAMERA SETUP

then; normal recording will be constant on cameras 3 & 4. Cameras 1 & 2 will only record when motion detection is triggered (for the duration of motion plus the post-trigger time).

3.1.7   Mask View/Edit

MASK VIEW/EDIT allows the user to define the area of each camera to be monitored for motion detection. This is done using a moveable and variable size box cursor.

The box cursor is moved and resized using controls on the Reviewer.

By default, when a camera view is first selected, the entire view is activated and is therefore included in motion detection.

> **NB**: Any areas set to be included/excluded will be saved to the X300 and maintained, even after a reboot.

Menu keys to move / size the box cursor:

Play key	increase box width
Fast Forward key	increase box height
Back key	decrease box width
Rewind key	decrease box height

When the **GREEN** box is shown:
    0 key =   activate/include area (camera view is clear).

When the **RED** box is shown:
    0 key =   deactivate/exclude area (camera view is greyed out).

Multiple areas can be defined.

Excluded areas will be greyed out.

The STOP key is used to switch the select box between **GREEN**, **RED** and BAR GRAPH modes.

3.1.7.1   Bar Graph tool

The BAR GRAPH tool assists the user in determining the PERCENTAGE and DURATION settings. It is useful to test the active and inactive areas for motion detection when setting these up on a Reviewer.
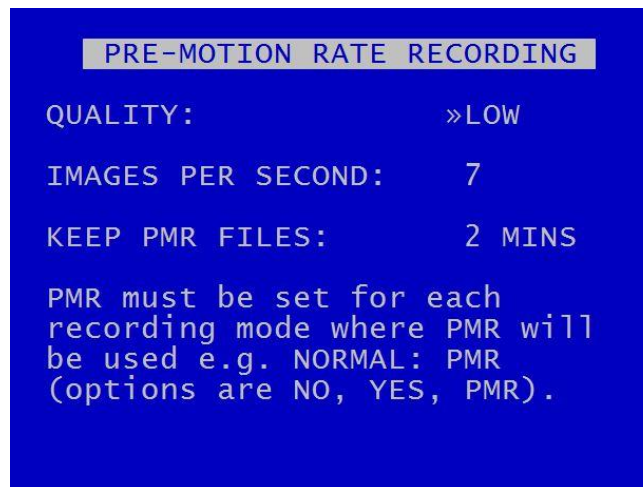
When the BAR GRAPH is shown:
0 key =   reset red maximum marker to zero
Up/Down   increase/decrease PERCENTAGE

As the marker on the BAR GRAPH is moved, the corresponding percentage for the relevant camera view will change on the MOTION DETECTION CAMERA SETUP page.

3.1.7.2   Pre-Motion Rate Recording

```
 ┌────────────────────────────────────────┐
 │       PRE-MOTION RATE RECORDING         │
 │                                         │
 │  QUALITY:                »LOW           │
 │                                         │
 │  IMAGES PER SECOND:      7              │
 │                                         │
 │  KEEP PMR FILES:         2 MINS         │
 │                                         │
 │  PMR must be set for each               │
 │  recording mode where PMR will          │
 │  be used e.g. NORMAL: PMR               │
 │  (options are NO, YES, PMR).            │
 │                                         │
 └────────────────────────────────────────┘
```
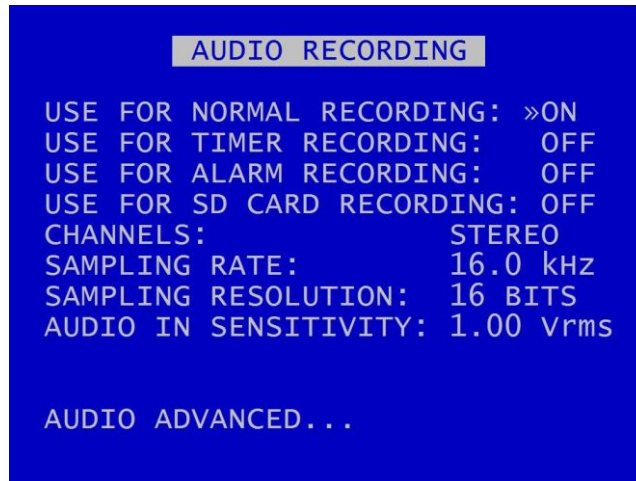
PRE-MOTION RECORDING (PMR) - Pre motion recording feature enables a user to configure the X300 to record files at a lower IPS during non motion periods, then increase the IPS when recording is triggered by motion. In this instance, a file may consist of low IPS, then higher IPS, then low IPS footage as the motion trigger is set on/off.

When PMR is active, the RECORD LED will be on continuously.

Within the MOTION RECORDING menu, PMR must be set for each recording mode where PMR will be used e.g. NORMAL:PMR (options are NO, YES, PMR). X300 recording priorities still apply i.e. Alarm takes over from Normal, even when motion or PMR is set.

3.1.8   Audio Recording

```
        AUDIO RECORDING

  USE FOR NORMAL RECORDING: »ON
  USE FOR TIMER RECORDING:   OFF
  USE FOR ALARM RECORDING:   OFF
  USE FOR SD CARD RECORDING: OFF
  CHANNELS:               STEREO
  SAMPLING RATE:          16.0 kHz
  SAMPLING RESOLUTION:    16 BITS
  AUDIO IN SENSITIVITY: 1.00 Vrms


  AUDIO ADVANCED...
```

This menu allows configuration of the audio recording parameters. Audio can be enabled or disabled (ON / OFF) for NORMAL, TIMER, ALARM and SD CARD recording.
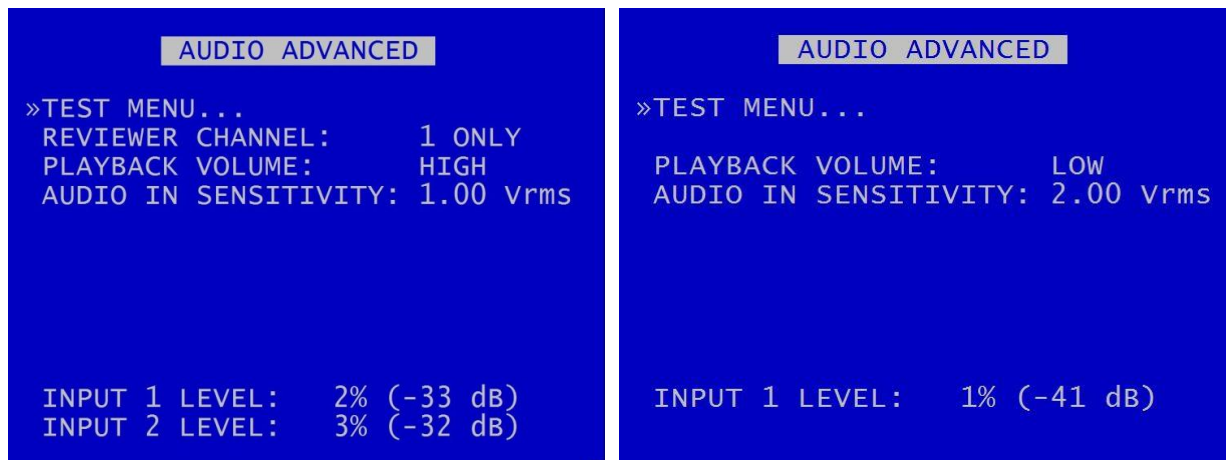
 The X300 Mark 2 can be configured to record audio from a single (mono) channel input or two (stereo) audio inputs.

The X300-16M has a single audio input.

> **NB**: The X300 inputs are line-level therefore some microphones will require the use of a dedicated preamplifier. See Audio section for more details.

The X300 samples at the following kHz RATES; 8, 16, 32, 44.1kHz (CD quality) and 48 kHz. Changing the RATE will affect the X300 recording time before the cartridge loops and begins overwriting the oldest footage. Resolution is fixed at 16bits.

3.1.8.1   Audio Advanced

AUDIO ADVANCED	AUDIO ADVANCED
»TEST MENU... REVIEWER CHANNEL: 1 ONLY PLAYBACK VOLUME: HIGH AUDIO IN SENSITIVITY: 1.00 Vrms INPUT 1 LEVEL: 2% (-33 dB) INPUT 2 LEVEL: 3% (-32 dB)	»TEST MENU... PLAYBACK VOLUME: LOW AUDIO IN SENSITIVITY: 2.00 Vrms INPUT 1 LEVEL: 1% (-41 dB)
X300 Mark 2 Audio Advanced	**X300-16M Audio Advanced**

Audio Advanced gives further options for configuring Audio features.

TEST MENU – provides options for testing the audio functions.

REVIEWER CHANNEL – **X300 Mark 2 only** – The X300 Mark 2 has two audio inputs, however the Reviewer only has one audio output. The REVIEWER CHANNEL function is used to switch the live/playback output channel between 1, 2 or 1 AND 2.

PLAYBACK VOLUME – Individual audio channels can be played back using PCLink Suite software. Playback via the Reviewer is in mono via channel 1 only (Left). PLAYBACK VOLUME of the Reviewer's built in speaker can be adjusted between; MUTE, LOW, MEDIUM, HIGH, FULL.

The X300 is configurable so that the line-level input range can be set from 0.12 - 2.0Vrms (sensitivity). When recording, the INPUT LEVELS will be shown as a percentage so the X300 can be setup to avoid clipping. The sensitivity configuration will be dependent on the environment of the installation.

3.1.8.2   Audio test menu
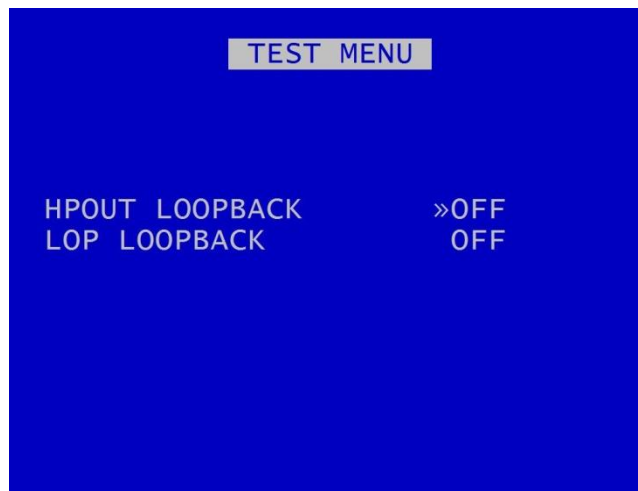
The audio TEST MENU provides two options for testing the output of the incoming live audio feed:

HPOUT LOOPBACK – High Power Output, for listening to live audio using the speaker on the Reviewer.

LOP LOOPBACK – Line Output, for listening to live audio using the read panel audio out.

3.1.9   Recorded Files

```
                RECORDED FILES
»FIRST / LAST PAGE
 PAGE  1  OF  17
 WSMGA FILTER OFF              SIZE MB
 _____ 12:00:00 15/10/18 1463.5
 _____ 11:50:00 15/10/18 3117.2
 _____ 11:40:00 15/10/18 2948.6
 _____ 11:30:00 15/10/18 3263.7
 _____ 11:20:00 15/10/18 3100.2
 _____ 11:10:00 15/10/18 2982.5
 _____ 11:00:00 15/10/18 3270.8
 _____ 10:58:02 15/10/18 612.7
 _____ 10:50:00 15/10/18 2310.3
 _____ 10:40:00 15/10/18 2955.4
```

Lists the recorded files and allows the user to select a file for playing or to change the write protect state of a file.

Files are shown in chronological order, most recent file first. Files are displayed by;

HH:MM:SS   DD/MM/YY   SIZE MB

File status indicators include;

A   - Alarm
W   - Write protected
M   - Motion detection
P   - Motion detection (pre trig)
S   - Shot
G   - GSensor
K   - Alarm PAR Keep

A file may have multiple statuses. For example a write protected alarm file that was triggered by motion could have; A W M _ _

A file with a W status will not be overwritten on Loop Recording. The W status can be added or removed by pressing the Left key when the cursor is next to the recorded file.

Navigation of the RECORDED FILES is via the Menu keys on the Reviewer.

First / Last page;

Left key   - go to last page
Right key   - go to first page

Page;

Left key   - go to next page
Right key   - go to previous page
Up/Down keys   - move cursor to a file
Right key   - play file

FILTER ON/OFF - The recorded files list can be quickly filtered in order to display *only* a certain file type e.g. only those that are **A**larm files.

3.1.10 Video Output

These menus control the automatic switching and dwell time of cameras on the MAIN video out (X300 all models) and the AUX video out (X300-16M only).

When selecting the VIDEO OUTPUT menu item from the MAIN MENU the X300 will display the appropriate menu below.
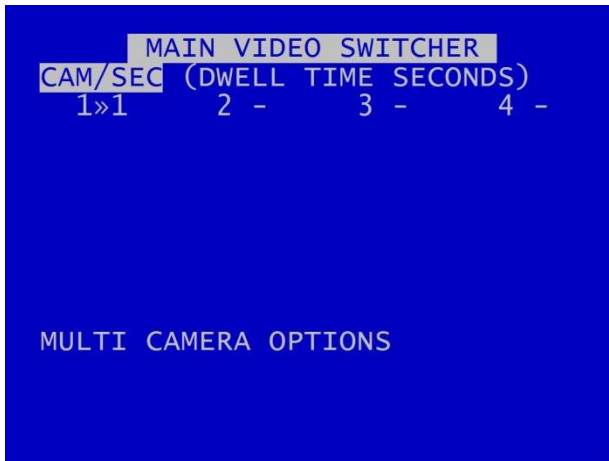

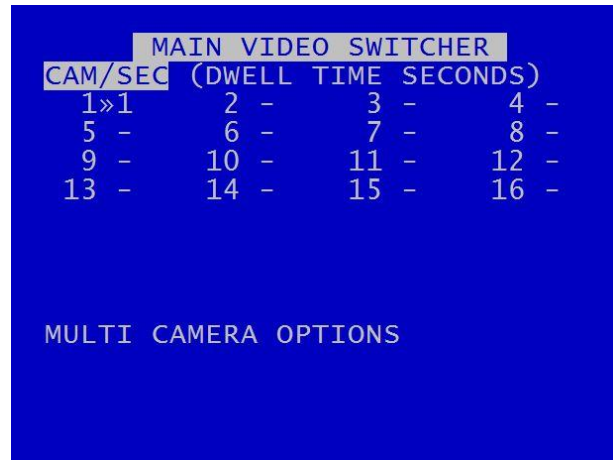   **X300 Mark 2 Video Output Menu**   **X300-16M Video Output Menu**

3.1.11 Main Video Switcher

```
      MAIN VIDEO SWITCHER                        MAIN VIDEO SWITCHER
 CAM/SEC (DWELL TIME SECONDS)             CAM/SEC (DWELL TIME SECONDS)
    1»1    2 -    3 -    4 -                 1»1    2 -    3 -     4 -
                                             5 -    6 -    7 -     8 -
                                             9 -   10 -   11 -    12 -
                                            13 -   14 -   15 -    16 -


 MULTI CAMERA OPTIONS                      MULTI CAMERA OPTIONS
```

    X300 Mark 2 Main Video Switcher Menu   **X300-16M Main Video Switcher Menu**

Set the desired camera DWELL time (in seconds) next to each camera that is to be included in the switcher sequence.

MULTI CAMERA OPTIONS – allows the simultaneous viewing of a number of cameras . The output is split into tiles per camera. Multi view can be included in the Auto switching sequence.

3.1.12 Multi Camera Options

```
       MULTI CAMERA OPTIONS

 MULTI CAMERA SETUP...

 MULTI CAMERA VIEW...

 MULTI CAMERA(SEC):   »-
  CAM TEXT POSITION:  NO TEXT
  TIME/DATE POSITION: NO TEXT
  SHOW REC STATUS:    YES
```
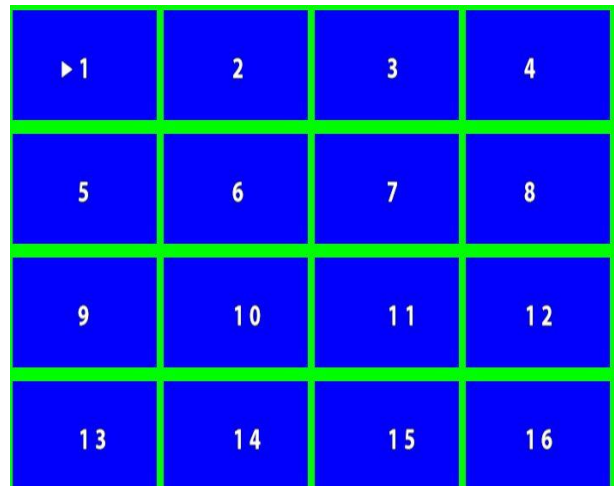
Multi camera view allows the simultaneous viewing of a number of cameras. The output is split into tiles per camera (4 or 16 depending on model). Multi camera view can be included in the Auto switching sequence.

X300 Mark 2; each tile can be set to display a quarter view of a camera.

X300-16M; each tile can be set to display a sixteenth view of a camera. If the same camera number is set to four tiles in a square then a quarter view will be shown.
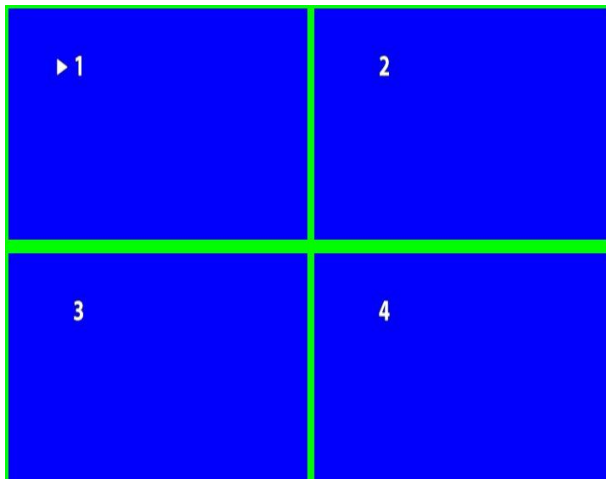
X300 Mark 2 Multi Camera Setup   **X300-16M Multi Camera Setup**

MULTI CAMERA SETUP Use the Reviewer to toggle through the camera numbers to select the required camera for each tile.

MULTI CAMERA VIEW; displays multi camera output as per the current settings.

MULTI CAMERA (SEC) – sets the number of seconds for which the MULTI CAMERA VIEW is displayed. Available options are 1SEC, 2,3, 4,5, 10, 20, 30 SECONDS.

> Pressing the Auto key on the Reviewer will switch the video output between the configured cameras for the set period of time. Single camera output is selected by pressing the camera number on the Reviewer.
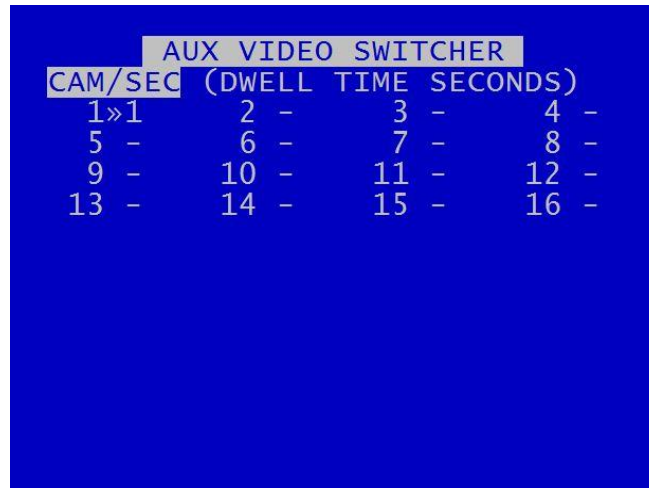
CAMERA TEXT POSITION - sets the position of Live camera text e.g. CAM1 could be "FRONT ENTRANCE". This is useful for operators who are monitoring the camera outputs. The camera text itself is set at SETTINGS MENU > CAMERA SETTINGS > CAMERA TEXT.

TIME/DATE POSITION – displays the current date and time on the multi screen view. Select from NO TEXT, BOTTOM HIGH, BOTTOM MIDDLE, BOTTOM LOW, TOP HIGH, TOP MIDDLE, TOP LOW.
NB: this does not affect the date/time timestamp being recorded into the images – this is set in SYSTEM SETTINGS > CAMERA SETTINGS.

SHOW REC STATUS – Select YES or NO to determine whether the recording status is shown on the embedded text in MULTI CAMERA setup.

3.1.13 Auxiliary Video Switcher (X300-16M only)

```
          AUX VIDEO SWITCHER
CAM/SEC (DWELL TIME SECONDS)
   1»1     2 -     3 -     4 -
   5 -     6 -     7 -     8 -
   9 -    10 -    11 -    12 -
  13 -    14 -    15 -    16 -
```

AUX VIDEO SWITCHER configures the settings for the auxiliary (secondary) video output (only available on the X300-16M).

3.2   Settings Menu

3.2.1   System Settings

The SYSTEM SETTINGS MENU gives access to configure various system settings and to view system information

3.2.2   Time and Date

```
        ┌─────────────────────────┐
        │     TIME  AND  DATE      │
        │                          │
        │  TIME:»14:25:57          │
        │  DATE: 16/10/18          │
        │  MODE: DD/MM/YY          │
        │                          │
        │  SET CLOCK TO THESE SETTINGS... │
        │                          │
        │                          │
        │                          │
        │  SUMMERTIME ADJUST:    UK │
        │  SUMMER/WINTER TIME:   SUMMER │
        │                          │
        └─────────────────────────┘
```

TIME AND DATE menu displays the current time/date. New times/dates can be set by entering new values using keys 0-9 on the Reviewer.

SET CLOCK TO THESE SETTINGS – confirms and sets the new time/date.

The date display MODE can be switched between DD/MM/YY and MM/DD/YY. The chosen format will be used for date entry and display throughout the system.

NB: date and time settings cannot be changed while the DVR is recording.

Summer time adjustment can be selected for UK, EUR USA , NZ and OFF.

Summer time adjust automatically updates the system to daylight saving time, valid for the country selected. Adjustments are applied even if the system was powered off during the time change.

When the clock is put forward, the time is now summer time, which is winter time +1 hour. When the clock is put back, time reverts to winter time.

UK - At 1am on the last Sunday in March, the clock is put forward an hour. At 2am on the last Sunday in October, the clock is put back and hour.
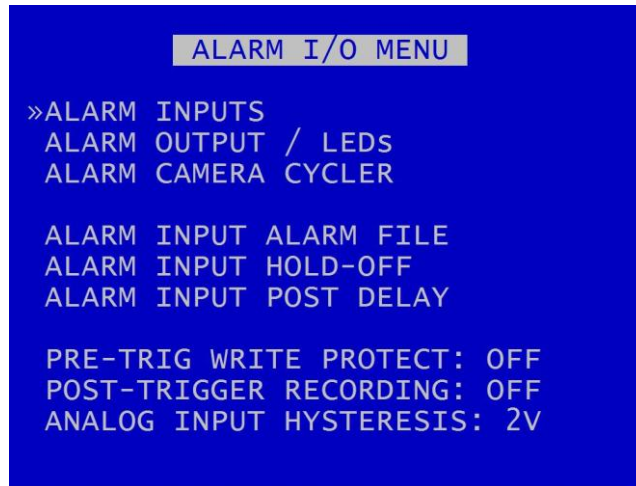
Central Europe - At 2am on the last Sunday in March, the clock is put forward an hour. At 3am on the last Sunday in October the clock is put back an hour.

USA - At 2am on the second Sunday in March, the clock is put forward an hour. At 2am on the first Sunday in November, the clock is put back an hour.

NZ – at 2am on the last Sunday in September, the clock is put forward an hour. At 3am on the first Sunday in April, the clock is put back an hour.

NB: when time or date are changed, a hard disk re-format is recommended in order to reset the meta file.

3.2.3   Alarm Inputs/Outputs menu

```
        ALARM I/O MENU

»ALARM  INPUTS
 ALARM  OUTPUT  /  LEDs
 ALARM  CAMERA  CYCLER

 ALARM  INPUT  ALARM  FILE
 ALARM  INPUT  HOLD-OFF
 ALARM  INPUT  POST  DELAY

 PRE-TRIG  WRITE  PROTECT:  OFF
 POST-TRIGGER  RECORDING:  OFF
 ANALOG  INPUT  HYSTERESIS:  2V
```

Alarm Inputs and Outputs can be configured as per the ALARM INPUTS/OUTPUTS menu in settings for ALARM RECORDING.
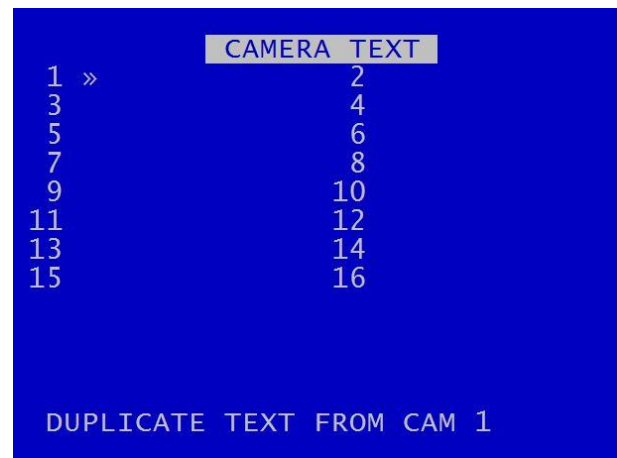
3.2.4   Camera Settings

CAMERA SETTINGS menu configures the CAMERA TEXT labels, timestamp position, VIDEO SETTINGS and camera disconnect time.

TIMESTAMP POS - the timestamp can be positioned either below (BOTTOM) or above (TOP) the main area of the recorded image and fine adjustment of position made with LOW/MIDDLE/HIGH settings. The timestamp can also be turned off (select NO TIMESTAMP) and will not be written in to the recorded images.

VIDEO SETTINGS - controls the video standard (PAL or NTSC).

CAMERA DISCONNECT TIME – this option allows disconnected cameras to be reported as connected for a set time period. This is useful in cases where a camera can take a while to boot and send its signal. If there is no signal after the timeout, the camera is treated as disconnected and is flagged in the service log.   Available options are OFF, 10SEC, 30SEC, 1MIN, 2MIN, 5MIN.

3.2.4.1   Camera text
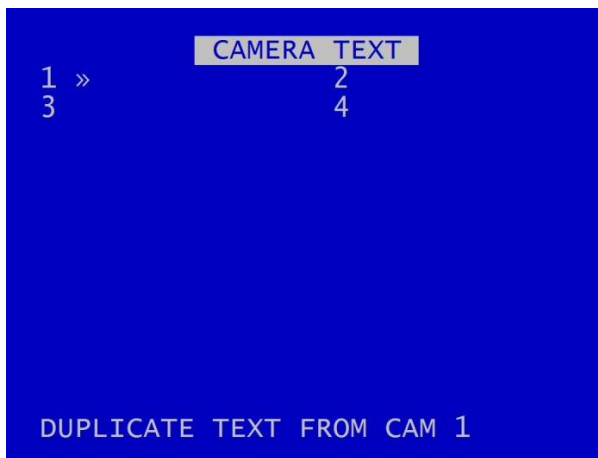
X300 Mark 2 Camera Text Menu   **X300-16M Camera Text Menu**

Individual text for each camera can be inserted above the timestamp. This text, along with timestamp, will be shown on recorded images.

12 user-defined characters can be input per camera. Enter text using the Text and Number Input keys on the Reviewer.

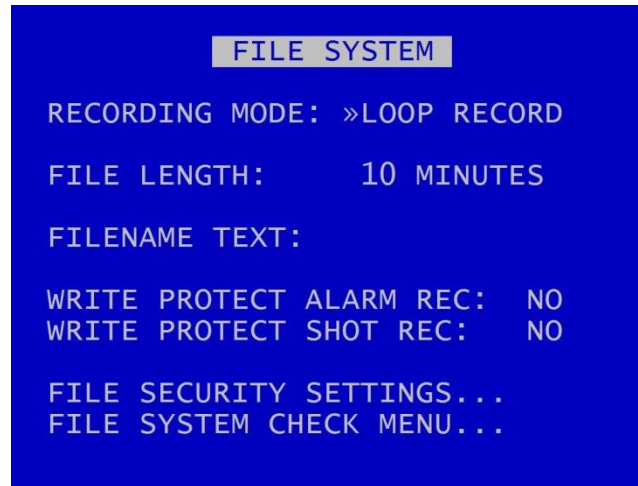DUPLICATE TEXT – feature is available for copying down text from camera 1 to all remaining cameras.

3.2.4.2   Video Settings

VIDEO SETTINGS menu controls the video standard, i.e. whether the unit is to operate with PAL or NTSC cameras.

NB: after changing the Video Standard setting, the unit will automatically reboot after 5 seconds for the change of setting to take effect. A red "Reboot Required" warning will flash on the screen before the reboot commences.

3.2.5   File System

```
        ┌──────────────────┐
        │   FILE SYSTEM    │
        └──────────────────┘

   RECORDING MODE: »LOOP RECORD

   FILE LENGTH:     10 MINUTES

   FILENAME TEXT:

   WRITE PROTECT ALARM REC:   NO
   WRITE PROTECT SHOT REC:    NO

   FILE SECURITY SETTINGS...
   FILE SYSTEM CHECK MENU...
```

FILE SYSTEM MENU Sets the parameters of the file system and how files are laid to disk.

RECORDING MODE sets either:

- LOOP RECORD (oldest files will be overwritten first when the hard disk cartridge is full) or
- SINGLE PASS recording (recording will stop when the hard disk cartridge is full).

FILE LENGTH – controls how often a new file is created. A new file is created each time recording starts. The file will be named with the date/time when the recording started. If continuous recording, the next file will be started as per the file length settings or when next time boundary is met.

For example when using 10min files, if recording starts at 10:03, the first file will contain 7minutes of video and the second file will be started at 10:10. New files will then be created every 10 minutes, i.e.10:20, 10:30 etc.   Files can be configured for: 1 MINUTE, 5 MINUTES, 10 MINUTES, or 1 HOUR.

NB: File size is limited to 4GB. After this limit is reached, a new file will be created.

FILENAME TEXT – prefixes the recording files with up to 12 user defined characters (0-9, A-Z, space). Text and numbers are entered using the Reviewer.

WRITE PROTECT ALARM REC – selects whether alarm recording files are write protected. If alarm files are write-protected they will not be deleted on LOOP recording. Select YES/NO.

WRITE PROTECT SHOT REC – selects whether shot recording files are write protected. If shot files are write-protected they will not be deleted on LOOP recording. Select YES/NO.

FILE SECURITY SETTINGS – provides options for setting file security on the DVR.

FILE SYSTEM CHECK menu – configures whether the file system is checked (and possibly corrected) at power up and also if a system log is created.

3.2.6   File Security Settings

```
     FILE SECURITY SETTINGS

SECURITY LEVEL:»DISABLED

    OLD PASSWORD:
    NEW PASSWORD:
CONFIRM PASSWORD:

 SET PASSWORD...
```

This menu provides options for setting file security on the DVR.

NB: any settings configured here on the DVR menu will be over-written by LANLink if LANLink is managing the security settings for the DVR. Contact Timespace for further details.

Select from the 3 available levels of file protection:

DISABLED – No file protection.

PASSWORD – the files are password protected.

PASS. & ENCRYP. – the files are password protected and the audio and video data in the file is encrypted.

3.2.6.1   Setting a password

A password length from 1 – 14 characters is valid. Timespace recommends a password of 5 or more characters. All characters that can be entered from the Reviewer are valid:

NB: the default old password is 0000 (four zeros).

SET PASSWORD will set the new password and activate the selected File Security Settings.

3.2.6.2   DVR Menu and Playback Protection:

Optionally set a MENU and PLAYBACK Pin can be set (see SETTINGS MENU > SYSTEM SETTINGS > SYSTEM SECURITY). This prevents unauthorised access to the DVR menu settings, but permits controlled access eg for engineers in the field to review camera angles on a Reviewer and amend settings.

3.2.7   File System Check
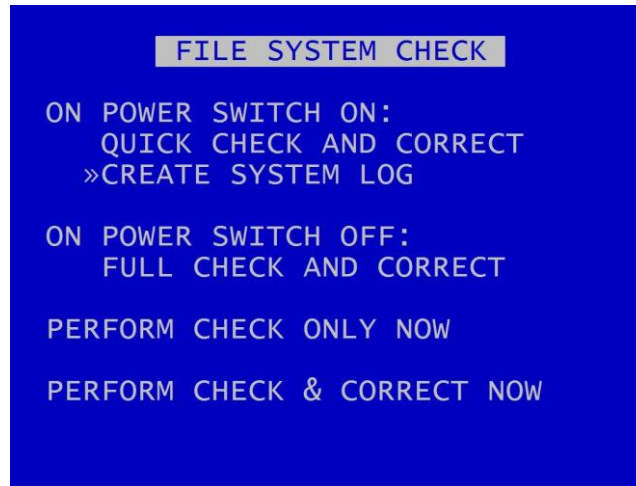
FILE SYSTEM CHECK menu configures whether the file system is checked (and possibly corrected) at power up and also if a system log is created.

ON POWER SWITCH ON: QUICK, FULL or NO check can be selected. Quick is default (and recommended).

PERFORM CHECK ONLY NOW will check the files and file system and report any errors but will not attempt to fix anything.

PERFORM CHECK AND CORRECT NOW will perform a file and file system check and fix any errors that are found. It also rewrites the FAT and BOOT sectors.

NB: No XBA files/data are deleted during the check and correct function.

3.2.8   System Info

```
        SYSTEM INFO

1.5.1.416    OPERATING SYSTEM
    224/H    FIRMWARE
   500.11    SIZE IN GIGABYTES
  98.46 %    USED
   0.03 %    WRITE PROTECTED
      161    FILES
 14/10/18    START DATE
 15/10/18    END   DATE
     1.10    DAYS RECORDING

  X300-MK2   H/W VERSION
   165453    SERIAL NUMBER
```

Displays information about the system;

OPERATING SYSTEM – Currently installed/running software version.

FIRMWARE – Currently installed/running firmware version.

SIZE IN GIGABYTES - Total size of installed hard disk cartridge.

USED - Percentage of hard disk cartridge used by any files.

WRITE PROTECTED – Percentage of cartridge used by write protected files.

START DATE - The date of the first (oldest) file on the cartridge.

END DATE - The date of the last (newest) file on the cartridge.

DAYS RECORDING - The number of days between the start/end date. **NB** that there may not be continuous recording files between the start/end date.

HARDWARE VERSION - The model number of the DVR.

SERIAL NUMBER - Displays the X300 serial number.

3.2.9   System Security

```
            SYSTEM SECURITY

   SYSTEM PIN REQUIRED FOR:

   RECORD:        »NO
   MENU:           NO
   SWITCHER:       NO
   PLAY:           NO
   READ ONLY:      NO

   CHANGE SYSTEM PIN...


   FTP/TELNET USERS
```

The SYSTEM SECURITY menu sets a password to restrict user access to five key areas of the system. A read-only access can be set that allows files to be viewed and limited features to be used.   For each area, select YES/NO.

NB: File Security Settings (access password and encryption protection for the recorded files) – are set separately at SYSTEM SETTINGS > FILE SYSTEM > FILE SECURITY SETTINGS.

RECORD - If set to YES, the record button on the front panel and the Reviewer are pin code protected.

MENU - If set to YES, access to the menu system is pin code protected.

SWITCHER - If set to YES, the button to activate auto switcher mode is pin code protected.

PLAY – If set to YES, the controls to review recorded footage are pin code protected.

READ ONLY - If set to YES, the user cannot change any setting on the X300. The menu system can be browsed but no settings changed. If a setting change is attempted, the element will flash in RED for 2 seconds and not be changed. To exit read only mode, change read only to NO, at which point you will be prompted for the pin code.

If access to a pin code protected function is attempted, the user is prompted with the "enter pin code" screen. On correct pin code entry the pin code protection is temporarily disabled while that function is being used.

CHANGE SYSTEM PIN – provides options for changing the pin code.

FTP/TELNET USERS – gives options to access the X300 by FTP/Telnet.

3.2.9.1   Change PIN

```
        CHANGE PIN
OLD PIN:            »

NEW PIN:

CONFIRM NEW PIN:

SET PIN...
```

CHANGE PIN menu provides options for changing the pin code.

The pin code can be changed by first entering the current pin code, followed by the new one (entered twice for verification). The pin code format is four digits only 0-9.   Enter numbers using the Reviewer.
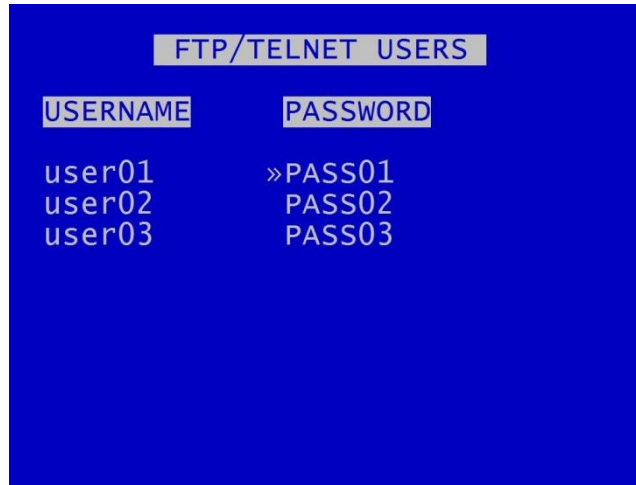
NB: the default old pin code is 0000 (four zeros).

Set the new PIN by selecting SET PIN.

In the event of a complete password lockout, contact your installer or Timespace for a master unlock code; email support@tspace.co.uk

NB: File Security Settings – file access password and encryption protection – are set separately at SYSTEM SETTINGS > FILE SYSTEM > FILE SECURITY SETTINGS.
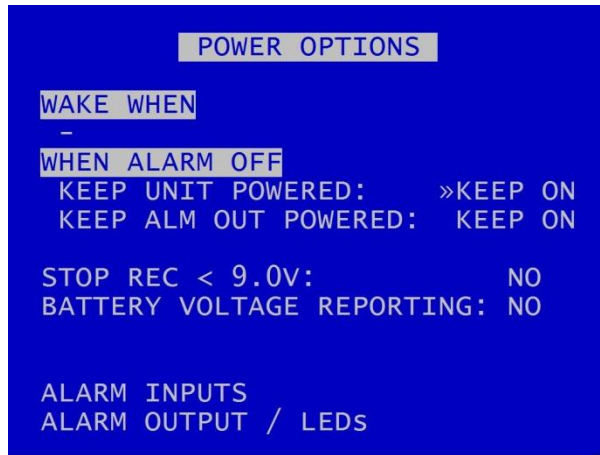
3.2.9.2   FTP/Telnet User Passwords

FTP/TELNET USERS menu gives the option to have three different passwords to access the X300 via FTP/TELNET.

The usernames are fixed; however the passwords can be set as required, and are case sensitive.

3.2.10 Power Options

POWER OPTIONS	POWER OPTIONS

X300 Mark 2 Power Options Menu   X300-16M Power Options Menu

POWER OPTIONS menu configures the behaviour of the X300 when the ignition alarm input trigger is detected. It also provides an option for a low battery warning.

WAKE WHEN – will display either "–" or IGNITION. NB: it is necessary to have one of the ALARM INPUT FUNCTIONS selected as IGNITION for this option to work.

WHEN ALARM OFF – sets the behaviour of the X300 when the ignition alarm input is not activated.

KEEP UNIT POWERED – select from options: KEEP ON, OFF, 1MIN, 5, 10, 15, 20, 30, 35, 40, 45, 50MINS, 1HOUR, 2HOURS, 3HOURS, 4HOURS.

KEEP ALM OUT POWERED – sets the requirements for continuing to power eg the cameras or monitors (depending on the model of X300). Select from options: KEEP ON, OFF, 5MINS, 10, 15, 20, 30, 35, 40, 45, 50MINS, 1HR, 2, 3, 4HRS.

STOP REC <9.0V – select YES to stop the unit from recording in a low power situation.   This will preserve the latest recording and the file system. If this option is set to NO and the power does reach <9.0V, recorded files cannot be guaranteed. This is a useful feature where batteries the X300 is being powered by batteries which have declining output over time.

BATTERY VOLTAGE REPORTING – select YES or NO. If the battery is at less than 11V, the service light will illuminate on the front of the unit.

ALARM INPUTS and – ALARM OUTPUT / LEDs provide quick links to these menus.

3.2.10.1   Power Diagnostics (X300-16M only)

```
       POWER DIAGNOSTICS
  X300-16M              9w
  12V CAMERA POWER  0.1w
  MAIN OUT POWER    0.0w
  AUX OUT POWER     0.0w
  TOTAL             9.1w
```
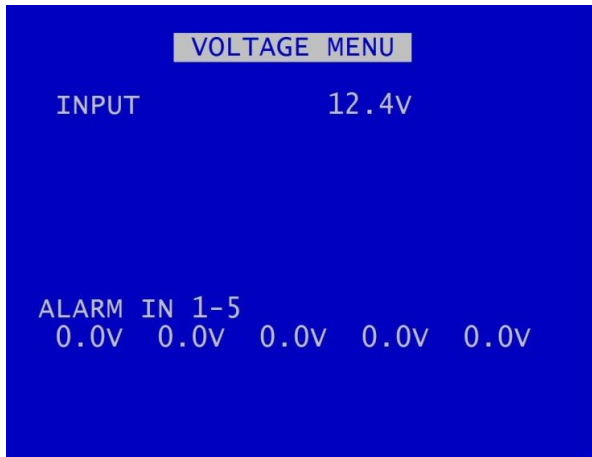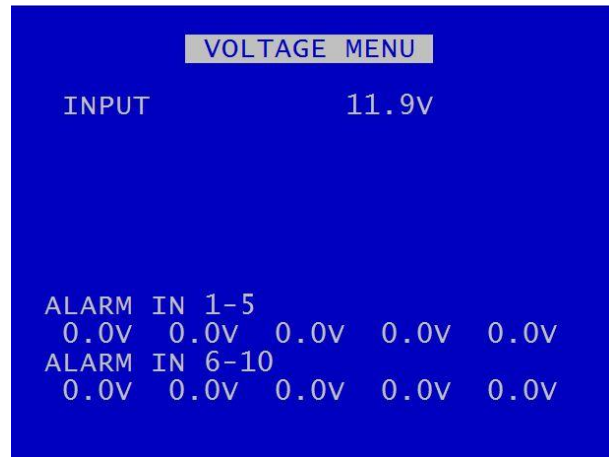
POWER DIAGNOSTICS displays the current power consumption, broken down into various sections, eg Cameras, Main/Aux switcher.

3.2.11 Voltage Menu

VOLTAGE MENU	VOLTAGE MENU
INPUT 12.4v	INPUT 11.9v
ALARM IN 1-5 0.0v 0.0v 0.0v 0.0v 0.0v	ALARM IN 1-5 0.0v 0.0v 0.0v 0.0v 0.0v ALARM IN 6-10 0.0v 0.0v 0.0v 0.0v 0.0v
X300 Mark 2 Voltage Menu	**X300-16M Voltage Menu**

VOLTAGE MENU page displays the current Voltage supply, broken down into various sections e.g. Alarm Inputs

3.2.12 GSensor

The X300-16M has a built-in GSensor which provides X, Y and Z axes data internally to the X300-16M. Data is displayed and recorded into each image along with optional GPS data.

> **NB:** The X300 Mark 2 does not have a built-in GSensor, but one can be connected via the RS232 serial port.

```
                 GSENSOR

   BRAKE        G     ACC           G
   35:13    0.02
   35:03    0.02
   26:37    0.02     LAT           G
   19:58    0.02     00:24    0.02
   17:27    0.02     00:19    0.02
   14:17    0.02     00:14    0.02
   UP           G     00:09    0.02
                      00:05    0.02
                      00:00    0.02

   »GSENSOR  SETUP     RESET  READINGS
```

GSENSOR menu configures settings for the GSensor.

GSensor readings are displayed for;

        BRAKE - Measurement of decreasing forward motion.

        ACC - Measurement of increasing forward motion.
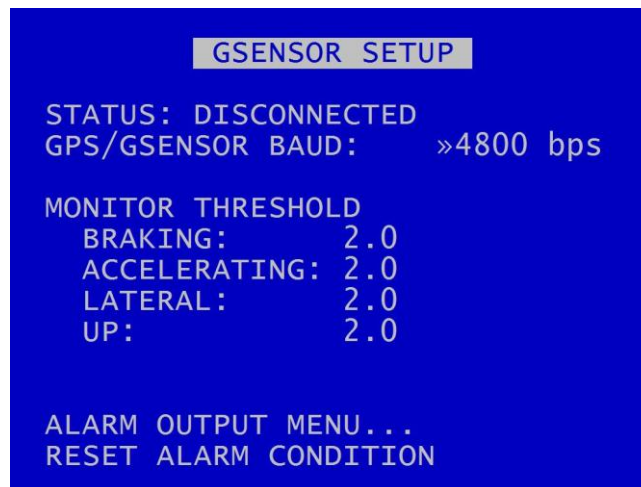
        LAT - Measurement of lateral movement.

        UP - Measurement of upwards motion.

GSENSOR SETUP - sets up the GSensor positioning.

RESET READINGS - Clears all current readings within this hour.

3.2.12.1   GSensor Setup – X300Mark 2

X300 Mark 2 GSensor Setup Menu

The X300 Mark 2 does not have a built-in GSensor, but a separate GSensor can be connected. If a separate GSensor is connected, the GSENSOR SETUP menu is used to configure the GSensor settings.

STATUS – shows whether a GPS is CONNECTED or DISCONNECTED.
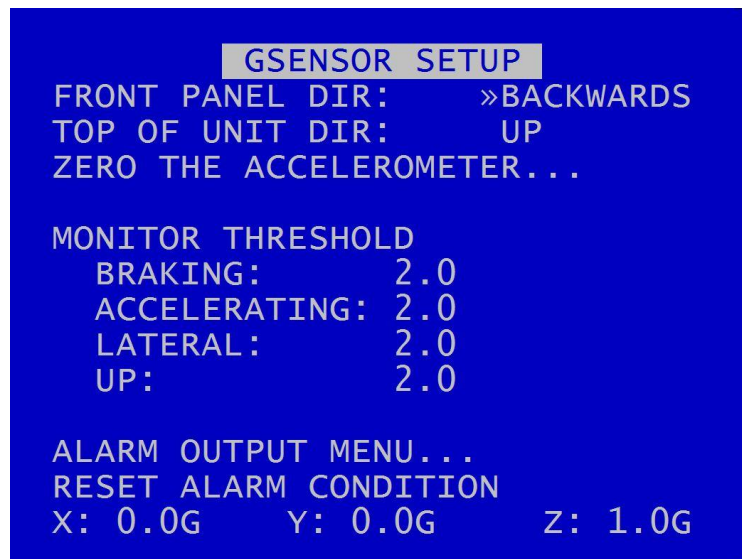
GPS / SENSOR BAUD: 2400, 4800, 9600, 19200, 38400

GSensor threshold triggers (for BRAKING, ACCELERATING, LATERAL and UP) can be configured from 0.1 - 2.0. If the set value is exceeded an alarm can be raised (used in conjunction with alarm outputs). A link to the ALARM OUTPUT menus gives quick access to configure the required action.

RESET ALARM CONDITION – clears the alarm condition.

3.2.12.2 GSensor setup – X300-16M

```
          GSENSOR SETUP
FRONT PANEL DIR:    »BACKWARDS
TOP OF UNIT DIR:      UP
ZERO THE ACCELEROMETER...

MONITOR THRESHOLD
  BRAKING:        2.0
  ACCELERATING: 2.0
  LATERAL:        2.0
  UP:             2.0

ALARM OUTPUT MENU...
RESET ALARM CONDITION
X: 0.0G    Y: 0.0G      Z: 1.0G
```

X300-16M GSensor Setup Menu

GSENSOR SETUP menu displays the GSensor configuration. The built-in GSensor is calibrated as part of the manufacturing process in a controlled environment and should not require calibration during the installation process.

However once the X300 is installed in a vehicle, the direction of the front panel and connector panel must be set in order to orientate the GSensor.

Set the FRONT PANEL DIRECTION, e.g. front panel set to FORWARDS means the X300 front panel is facing the front of the vehicle.

The TOP OF THE UNIT DIRECTION must then be set to LEFT, RIGHT, UP, DOWN, FORWARDS or BACKWARDS depending on the mounting position.

ZERO THE ACCELEROMETER– Once the panel directions are set, the GSensor orientation must be confirmed. Select ZERO THE ACCELEROMETER and follow the instructions on the screen.

GSensor threshold triggers (for BRAKING, ACCELERATING, LATERAL and UP) can be configured from 0.1 - 2.0. If the set value is exceeded an alarm can be raised (used in conjunction with alarm outputs). A link to the ALARM OUTPUT menus gives quick access to configure the required action.

RESET ALARM CONDITION – clears the alarm condition.

3.2.12.3   Zero the accelerometer
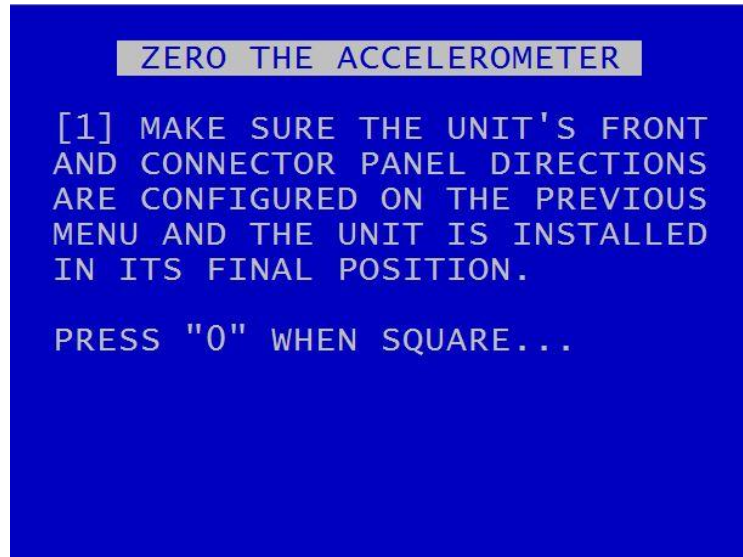
Once the X300-16M is installed in its final operating position, the GSensor readings must be zeroed by entering "0" when on the ZERO THE ACCELEROMETER screen. A second screen will confirm that this has been done.

3.2.13 Vehicle ID

This menu page allows entry of the vehicle's fleet ID number and registration number. This is recorded in system and health logs and makes it easier when using LANLink to identify the vehicle in which the recorder is fitted.

 Vehicle ID and registration number details can be entered using the Text and Number Input keys on the Reviewer.

3.2.14 Reset

```
         ┌─────────────────┐
         │     RESET       │
         └─────────────────┘

         »DELETE ALL RECORDING FILES
          SECURE DISK WIPE

          USER PROFILE 1:   USER 1
          USER PROFILE 2:   USER 2
          USER PROFILE 3:   USER 3

          PROFILE:          DEFAULTS
          LOAD PROFILE...
          SAVE PROFILE...

          MENU LANGUAGE:  ENGLISH
```

The RESET menu provides options for resetting the system and/or deleting files. The following options are available.

DELETE ALL RECORDING FILES
SECURE DISK WIPE

WARNING: THERE IS NO "UNDO" FUNCTION IF THESE OPTIONS ARE SELECTED.

USER PROFILES – three User Profiles can be configured with different settings for different uses or recording modes.

MENU LANGUAGE – can be set between ENGLISH (default) or FROM DISK.

When FROM DISK is selected, the X300 will load a language file from the cartridge with MENU and HELP text translated into a given language. The language template is pre-loaded to the cartridge by the user at the point of installation.

The language file will not be removed when running DELETE ALL RECORDING FILES.

NB: A power cycle is required before the new language settings will take effect.

3.2.14.1 Delete All Recording Files

```
 ┌──────────────────────────────────────┐
 │    DELETE ALL RECORDING FILES         │
 │                                        │
 │   WARNING:                             │
 │   THIS OPERATION DELETES               │
 │   ALL FILES ON DISK!                   │
 │                                        │
 │   PRESS EXIT TO ABORT AT ANY TIME      │
 │   AND RETURN TO PREVIOUS MENU OR       │
 │   PRESS RIGHT MENU ARROW TO            │
 │   DELETE ALL FILES ON DISK: »          │
 │                                        │
 └──────────────────────────────────────┘
```
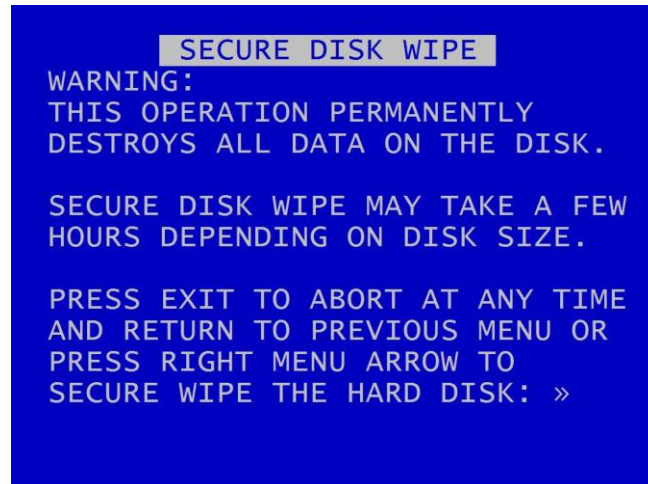
DELETE ALL RECORDING FILES – will remove all recordings from the hard disk, <u>including write-protected files</u>.

Only select this option if you want to completely remove all recordings – there is NO undo option. Press the right menu button to go to a warning screening, press right again to carry out this action. Pressing <u>Menu Exit</u> will abort this procedure.

> **WARNING**: THERE IS NO "UNDO" OPTION. SELECTING "DELETE ALL FILES ON DISK" WILL COMPLETELY REMOVE ALL RECORDINGS.

3.2.14.2 Secure Disk Wipe

SECURE DISK WIPE – will permanently delete all recording files on the hard disk. This option should only be selected if files need to be completely destroyed.

> **WARNING** : SELECTING "SECURE WIPE THE HARD DISK" WILL MEAN <u>NO</u> FILES CAN BE RECOVERED.

A final warning message will appear before this function is carried out. Pressing <u>Menu Exit</u> will abort.

3.2.14.3 User Profiles

```
                  RESET

»DELETE ALL RECORDING FILES
 SECURE DISK WIPE

 USER PROFILE 1:   USER 1
 USER PROFILE 2:   USER 2
 USER PROFILE 3:   USER 3

 PROFILE:          DEFAULTS
 LOAD PROFILE...
 SAVE PROFILE...

 MENU LANGUAGE:  ENGLISH
```

Three User Profiles can be configured with different settings for different uses or recording modes. This gives the user an easy way of quickly switching between types of recording required without having to setup the X300 each time. Each profile can be named individually.

In addition to the three user profiles, the X300 Default menu settings can be loaded.

PROFILE – select between DEFAULT and USER 1, 2 or 3.

LOAD PROFILE – loads the profile selected above.

SAVE PROFILE will write the currently loaded settings back to the flash memory, using the selected PROFILE name.

Example; User sets up NORMAL recording with 1 camera 5IPS, HIGH resolution. Go to the RESET menu and overwrite USER 1 with *"1CAM HIGH"*, then change the PROFILE to *1CAM HIGH* and select SAVE PROFILE. Change settings for ALARM on 2 cameras, then overwrite USER 2 with "*2CAM ALARM*", change the PROFILE to *2CAM ALARM* and select SAVE PROFILE. You now have 2 user defined profiles to easily switch between by LOADING the specified profile.


HINT: Save up to 3 of your most common settings using the USER PROFILES to allow quick switching between different types of recording mode for different installations. e.g.

USER PROFILE 1 - Normal record 4 IP cameras with audio.
USER PROFILE 2 - Normal record 8 cameras with GPS and SMS alert.
USER PROFILE 3 - Alarm record 4 cameras based on an external input.

3.3   External Equipment
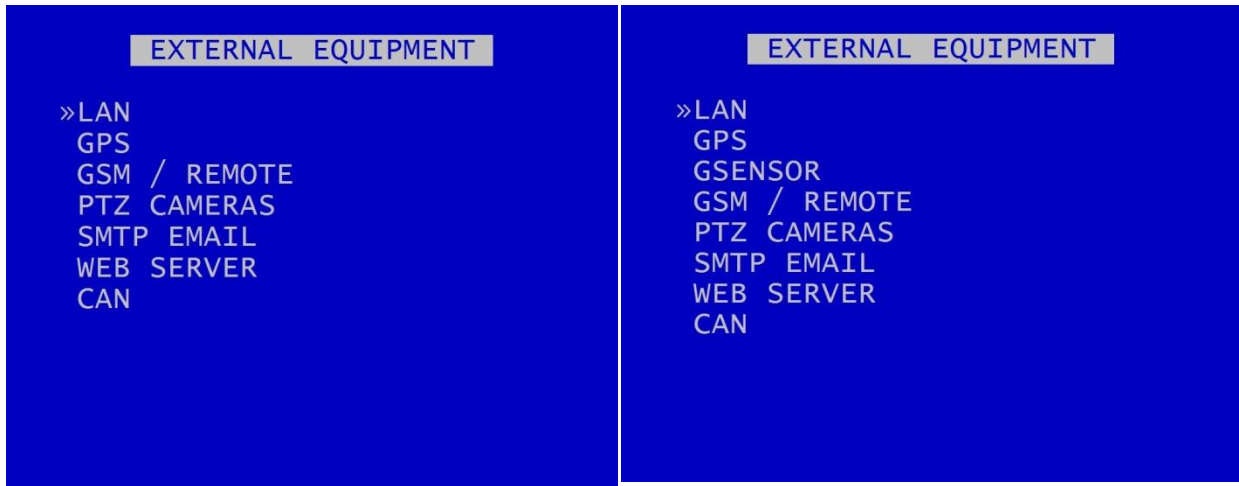
X300 Mark 2 External Equipment Menu   **X300-16M External Equipment Menu**

The X300 provides some common interfaces so that external equipment can be connected and configured for use with the DVR. All X300 connections can be seen on diagrams in section 6.4.4 X300 Connections.

3.3.1   LAN

```
                    ┌──────────┐
                    │   LAN    │
                    └──────────┘
       STATUS: CONNECTED
       IP ADDRESS:     » 10.  0.  6. 24
       SUBNET MASK:     255.255.  0.  0
       GATEWAY:          10.  0.  0.254
       DNS PRIMARY:       8.  8.  8.  8
       DNS SECONDARY:     8.  8.  4.  4
       USE DHCP:        NO

       APPLY IP SETTINGS ABOVE
       PING TEST...

       MAC:            00:0f:b4:00:2b:67
```

Allows the user to change the parameters of the LAN system. LAN STATUS indicates whether the X300 is currently connected to a LAN or not.

IP ADDRESS – Enter static (fixed) IP address that the X300 is to be assigned on the local area network. The default ip address is **10.0.0.200**

SUBNET MASK – Enter the subnet mask as applicable for the LAN the X300 is connected to. The defaults is 255.255.255.0

GATEWAY – Enter the gateway IP address of the default gateway the X300 will communicate with on the LAN.

DNS PRIMARY/SECONDARY – Enter the Domain Name System server address that you wish to use. Defaults to Google's primary/secondary.

DHCP – Enables/disables automatic IP address allocation. If there is a Dynamic Host Configuration Protocol server/router on the network it will assign an IP address to the X300, otherwise assign it manually and turn this feature off.

APPLY IP SETTINGS ABOVE – select to confirm and apply configurations set above.

PING TEST – enables the user to enter a destination IP address to send a network packet to test connectivity.

MAC is the unique hardware identifier for the network interface on the X300.
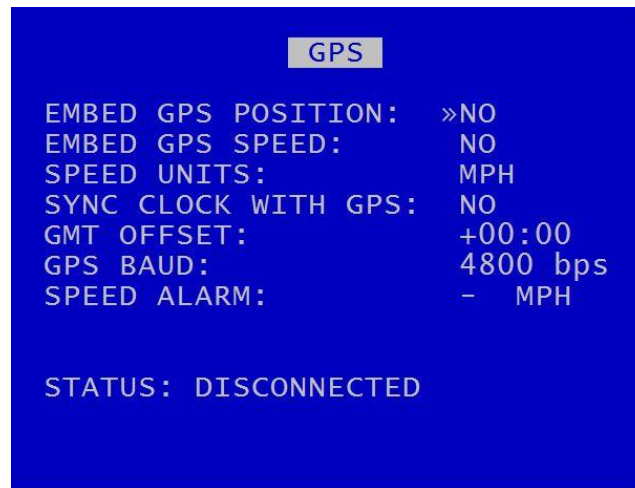
3.3.1.1   Ping Test

PING TEST menu enables the user to enter a destination IP address to send a network packet to test connectivity.

FRAMES SENT/RECEIVED updates in real-time to show how many data packets are being transferred to and from the X300. These are global values and not specifically related to only the ping test.

3.3.2   GPS

```
                        GPS

    EMBED GPS POSITION:    »NO
    EMBED GPS SPEED:        NO
    SPEED UNITS:           MPH
    SYNC CLOCK WITH GPS:    NO
    GMT OFFSET:           +00:00
    GPS BAUD:            4800 bps
    SPEED ALARM:          -  MPH


    STATUS: DISCONNECTED
```

Global Positioning System serial connection setup menu.

The X300 can be fed GPS data and embed coordinates into imagers for location identification and real-time mapping playback in PCLink.

The X300 can receive GPS data through the RS232 connector and embed the data into recorded images. GPS data includes positioning and speed and users can optionally turn these ON or OFF. When turned on, the data will be recorded with each image.

The X300 is compatible with the standard NMEA-0183 GPS protocol. A suitable GPS serial unit can be wired to specific pins on the X300 RS232 connector.

The X300 can provide +5V to the GPS mouse through the RS232 connector. Only GPS units which operate at this voltage and draw no more than 200mA should be used.

> **NB:** If the user chooses not to embed GPS data then it will not appear on the screen during playback in PCLink. However the data is still included in the XBA files, therefore the speed dials will still be shown in PCLink.

EMBED GPS POSITION – When set to YES will embed the position information in recorded images.

EMBED GPS SPEED – When set to YES will embed the speed information in recorded images.

SPEED UNITS can be set for miles per hour (MPH) or kilometres per hour (KPH).

SYNC CLOCK WITH GPS - The X300 can be configured to synchronize the clock with the data and time information received from the GPS unit. When set to YES the X300 will synchronize the clock on power up.

GMT OFFSET – When syncing with GPS time outside the UK, it is necessary to set the GMT offset for the country / region that the X300 is in, +/- to GMT.

GPS/GSENSOR BAUD set the baud rate at which the X300 will communicate with the GPS.

STATUS indicates whether or not a GPS unit has been detected. The status will be DISCONNECTED if not unit is detected, TRACKING SATELLITES if connected but no GPS lock has been established yet and if CONNECTED, GPS data/coordinates will appear.

3.3.3   GSensor

X300 Mark 2 - The X300 Mark 2 does not have a built-in GSensor, but one can be connected via the serial port.

Set-up for an externally connected GSensor is at SETTINGS MENU > EXTERNAL EQUIPMENT > GSENSOR .

X300-16M – the X300-16M has a built-in GSensor. Set-up is at SETTINGS MENU > SYSTEM SETTINGS > GSENSOR .

3.3.4   GSM/Remote

```
           GSM / REMOTE

 RS232: »GSM CONTROL

 GSM MODEM CONTROL
 SMS MESSAGES...
 HEALTH OVER SMS...


 GSM MODEM NOT AVAILABLE
 VIEW STATUS...
 RESET MODEM
 MODEM LOOPBACK TEST
 X200 COMPATIBILITY MODE: NO
```

Settings for the RS232 serial port can be configure here to either communicate with a GSM modem or other external equipment.

GSM CONTROL - Set port to send/receive data to a modem.
BAUD RATE   - Set port to a baud rate to communicate with external equipment

The X300 supports a token based command structure so that it can be integrated and controlled by 3rd party applications. A selection of data rate is available for external control: 2400, 4800, 9600, 14400, 19200, 38400, 56000, 115200. See RS232 EXTERNAL CONTROL section of the manual.

SMS MESSAGES can be setup and triggered by the X300.

HEALTH OVER SMS – send the X300 health status via SMS.

VIEW STATUS gives statistics of SMS messages sent/received as well as calls and image transfers. Using the RESET MODEM function will clear the statistics and send a modem reset command to the GSM modem.

With a special test plug fitted on the modem port, it is possible to LOOPBACK test and confirm the hardware is functional.

3.3.4.1   SMS Messages

```
        ┌─────────────────────────┐
        │     SMS MESSAGES        │
        └─────────────────────────┘

        »EDIT MESSAGES...

         SEND SMS:  NEVER
         USING:     MSG1
         SEND SMS NOW

         CONFIGURE ALARM INPUTS...
```

EDIT MESSAGES – configures the content of messages and sets the phone numbers for message recipients.
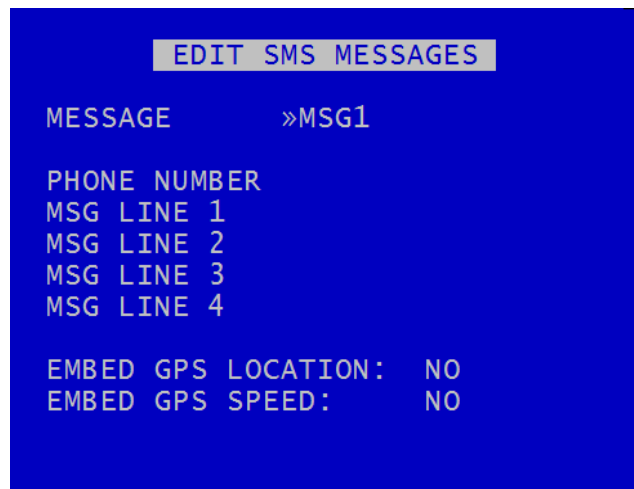
SEND SMS - select when to send an SMS message;

NEVER   - Never.
DAILY   - At midnight every day.
WEEKLY   - Every Monday (at midnight)
MONTHLY   - On the 1st of every month (at midnight).
POWER UP   - When the X300 powers up

This may be useful as a test to let you know the X300/Modem is still on and functioning.

SEND SMS NOW - Test the GSM/SMS connection by sending a message using one of the six configured messages.

CONFIGURE ALARM INPUTS – allows the user to set up SMS messages as ALARM INPUTS.

3.3.4.2   Edit SMS Messages

```
          EDIT SMS MESSAGES

MESSAGE          »MSG1

PHONE NUMBER
MSG LINE 1
MSG LINE 2
MSG LINE 3
MSG LINE 4

EMBED GPS LOCATION:    NO
EMBED GPS SPEED:       NO
```

Six different SMS messages can be configured with different text and recipients. Four lines of text can be inputted and additionally GPS location and speed can included in the SMS.

MESSAGE – shows which of the six available SMS messages is currently being configured.

PHONE NUMBER – allows the user to insert the number of the phone which is to receive the SMS messages.

MSG LINE 1-4 – allows the user to insert text into the body of the SMS messages. Text and number input is via the keys on the Reviewer.

EMBED GPS LOCATION/SPEED – select YES/NO to include/exclude this information in the SMS messages.

3.3.4.3   Health over SMS

```
          ┌─────────────────────────┐
          │     HEALTH OVER SMS      │
          └─────────────────────────┘

           PHONE NUMBER »

           SEND SMS:     NEVER
           DAILY TIME:  12:00

           INCLUDE IN SMS
           CAMERA1 TEXT:    NO
           FILENAME TEXT:   NO

           SEND SMS NOW

           LAST REQUEST   NOT KNOWN
```

HEALTH OVER SMS will send the X300 health status including recording state, last recorded file, camera status/faults, disk service conditions, GPS location and serial number.

The feature can be setup to send an SMS at a scheduled time or if queried by an incoming SMS. The incoming SMS must only include the words "SEND SMS NOW" and will then send an outgoing SMS to the phone number as configured.

PHONE NUMBER - Mobile number to send SMS health message to.

SEND SMS selects when to send an SMS message. Select between NEVER, AT DAILY TIME and POWER UP.

DAILY TIME - Specify the daily time the SMS message is to be sent when AT DAILY TIME is selected on the menu.

INCLUDE IN SMS - Set these options to YES to include the specified information in the SMS message.

SEND SMS NOW - Send a health message to the phone number specified now.

> **NB:** The SEND SMS NOW option cannot be invoked if connected to the X300 via RemoteLink using the GSM modem connection. If this option is invoked, the RemoteLink connection will be dropped and no SMS will be sent.

The Health SMS message will contain:

1. Type or reason for health SMS
2. Sending unit info
3. GPS info
4. Camera info
5. Time info
6. LED info
7. Service log info (which may be related to service/fail LED):

See APPENDIX 5 – Health SMS Format for further details on how to read the messages and integrate with other systems.
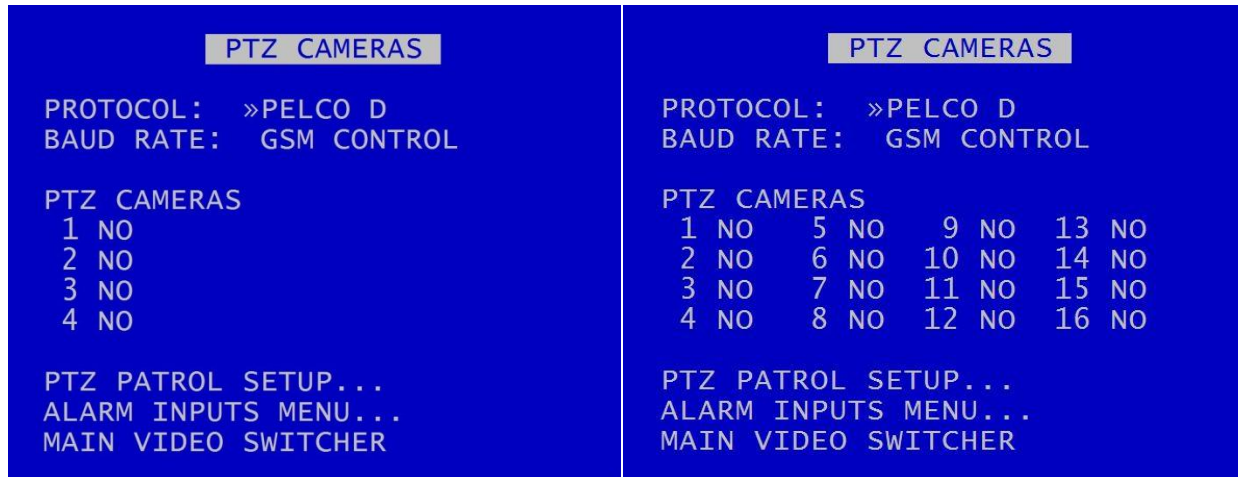
3.3.4.4   GSM Status

```
              GSM  STATUS

   CALLS  RECV   000

                 SMS    HEALTH
   RECV          000      000
   SENT          000      000
   ERRORS        000      000

   LAST  SENT
   SMS                NOT  KNOWN
   HEALTH  SMS    NOT  KNOWN
```

GSM STATUS gives statistics of SMS messages sent/received as well as calls and image transfers.

Using the RESET MODEM function will clear the statistics and send a modem reset command to the GSM modem.

3.3.5 PTZ Cameras

```
        PTZ CAMERAS                          PTZ CAMERAS

 PROTOCOL:  »PELCO D                  PROTOCOL:  »PELCO D
 BAUD RATE:  GSM CONTROL              BAUD RATE:  GSM CONTROL

 PTZ CAMERAS                          PTZ CAMERAS
  1 NO                                 1 NO    5 NO    9 NO   13 NO
  2 NO                                 2 NO    6 NO   10 NO   14 NO
  3 NO                                 3 NO    7 NO   11 NO   15 NO
  4 NO                                 4 NO    8 NO   12 NO   16 NO

 PTZ PATROL SETUP...                  PTZ PATROL SETUP...
 ALARM INPUTS MENU...                 ALARM INPUTS MENU...
 MAIN VIDEO SWITCHER                  MAIN VIDEO SWITCHER
```
X300 Mark 2 PTZ Cameras Menu   **X300-16M PTZ Cameras Menu**

The PTZ menu allows control over a Pan, Tilt, Zoom camera when connected to the X300's serial port. An RS232-to-RS485 convertor will be required.

Supported PTZ protocols are:

- Pelco D
- Pelco P
- Vicsa (Sony

The main PTZ functions are to move the camera Left, Right, Up, Down, Zoom in and Zoom out. There are advanced features for setting up focus behaviour and additionally the X300 can access the cameras' internal menus (if the camera supports it).

BAUD RATE – A selection of baud rates are available for the cameras: 2400, 4800, 9600, 14400, 19200, 38400, 56000, 115200. This baud rate setting is linked to the baud rate under the GSM / REMOTE SETTINGS menu. Only one of GSM or PTZ can be used at a time. Please refer to the Camera manufacturers' instructions on how to configure the camera baud rate.

The X300 can support multiple PTZ cameras assuming that they are all the same protocol and baud rate. PTZ has its own addressing system. On the PTZ Camera menu, use the Reviewer to navigate down to the required camera number, selecting YES in order to enter the PTZ mode. PTZ mode will enable PTZ controls and functions using the Reviewer.

PTZ PATROL SETUP – configures the PTZ camera to switch between its PRESET positions (as defined by the user). This is similar to the main video switcher, but the X300 is instructing the PTZ camera to move to different positions / zoom level.

ALARM INPUTS MENU – proivide3s a link to the ALARM INPUTS menu for configuring alarm functions to PTZ Presets etc.

MAIN VIDEO SWITCHER – provides a link to the MAIN VIDEO SWITCHER for configuring camera dwell times etc.

3.3.5.1   PTZ Patrol

PTZ PATROL SETUP menu configures the PTZ camera to switch between its PRESET positions (as defined by the user). This is similar to the MAIN VIDEO SWITCHER, but the X300 is instructing the PTZ camera to move to different positions / zoom level.

The X300 can store 8 different user defined camera positions, for example preset position 1 could be a scene view overlooking a car park, preset position 2 could be zoomed in close to the entrance, preset position 3 could be pointed at the exit. The presets can be accessed by pressing the number keys on the Reviewer for quick panning to locations. The presets can also be triggered via ALARM INPUTS.

PTZ key controls. are found in the separate manual for the REVIEWER.

NB – Some PTZ cameras will self enumerate in terms of PTZ addressing, some require physically setting using dip-switches (see manufactures instructions for details). You must connect the camera to the same DVR channel number as the PTZ addressing. If not, the controls within PCLink and the Reviewer may be associated with different connected cameras. If you are connecting self addressing PTZ cameras, they should be connected consecutively starting on channel 1.

3.3.6 SMTP Email

```
        SMTP EMAIL

FROM:»from@email.com
TO:   to@email.com
SUBJ: subject
BODY: Alarm
SEND: NEVER
TIME: 12:00
WHEN: -
CAM:  1
SEND NOW


SMTP SERVER
```

SMTP Email allows the X300 to send an email to a known email address when an event occurs. The message will contain text entered in the email SUBJECT and BODY as well as a snapshot image from a selected camera and the current GPS position.

The following events can trigger an email to be sent; POWER UP, AT DAILY TIME, on MOTION DETECTION, on ALARM. Configure the latter two options via the MOTION DETECTION and ALARM INPUT menus.

NB GPS position is not available if the email is set to send on power up.

There is a SEND NOW feature for testing.

SMTP SERVER – configures settings for the SMTP Email feature.

3.3.6.1   SMTP Server

```
          ┌─────────────────┐
          │   SMTP  SERVER   │
          └─────────────────┘
   SERV:»smtp.gmail.com
   PORT: 465
   SECURITY: SSL/TLS
   AUTH: NORMAL
   USER: usertest
   PASS: password
```

SMTP Server settings must be setup in order to use this feature. These settings are specific to the email server that you are using, not anything that the X300/Timespace provides.

SERV - Your email server e.g. myemailserver.com or smtp.gmail.com

PORT - X300 supports sending email over port 25 (standard SMTP) or port 465 (SSL).

AUTH - Select whether or not to use authentication (recommended to use authentication).

USER - Enter your email account username.

PASS - Enter your email account password.

> **NB:** the password is shown in clear text on the X300 menu in order to ensure that it is entered correctly. It is not stored in any log files or accessible by anyone unless they have a <u>Reviewer</u> - consider password protecting the X300 menu system for additional security (SETTINGS MENU > SYSTEM SETTINGS > <u>SYSTEM SECURITY</u>. Select YES for "System PIN required for MENU").

3.3.6.2   Web Server

The X300 has a built-in web server that can serve live images to a browser.

PORT ENABLED - YES/NO enables or disables the web server.

PASSWORD ENABLED - YES/NO turns web page password protection on or off.

USERNAME - sets the web browser username to be used if password is enabled. Default is **tsweb01**.

PASSWORD - sets the web browser password to be used if password is enabled. Default is **TSWEB01**.

A single camera image can be displayed and refreshed at a rate of 2 images per second (bandwidth dependent).

Options exist on the webpage to turn the stream on/off, select the camera to be displayed, stop/start recording and scale the image (useful for different connection/bandwidth types).

3.3.7   CANLink

```
                    CAN

    CAN FILTERING     »ON

    CAN ACTIVITY:      ABSENT



    CAN FILTER MODE



    ID:00000000 LN:00 TS:00000000
    DA:00 FF FF FF FF FF FF FF [00]
```
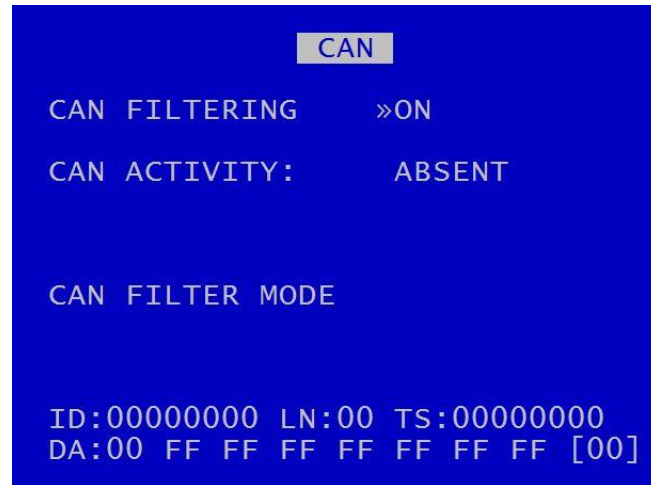
Timespace has developed a vehicle CAN (Controller Area Network) reporting system. The Timespace CANLink unit is separate from the DVR, and is available as a stand-alone unit, or a version to be used in connection with Timespace DVRS. Contact Timespace or your installer for further details of the CANLink unit.

 A secure CAN interface enables the DVR to record CAN data and download vehicle CAN information via the vehicle depot's WiFi/LANLink system.

The CAN menu screen shows CAN activity as either ABSENT or DETECTED. This is useful for diagnosing connection issues.

CAN FILTERING can be selected to be OFF or ON. When filtering is turned ON, only a subset of messages is recorded. These are mainly FMS, bus, truck and other J1939* messages. With filtering OFF, all CAN messages are recorded.

The default is for CAN filtering to be ON when the X300 is rebooted or powered up .

*Society of Automotive Engineers standard SAE J1939 is the vehicle bus recommended practice used for communication and diagnostics among vehicle components.

3.4   Advanced Menu

```
         ADVANCED

POWER STATE: »RECORD
ENABLE RECORD BUTTON: YES
LIVE VIEW:            NO
SPLASH SCREEN:        OFF
HEALTH PAGE DISPLAY:  OFF
FAIL QUOTA/DAY:       10/DAY
VIEW SERVICE LOG...

LOAD SOFTWARE/SETTINGS...
SAVE SOFTWARE/SETTINGS...
```
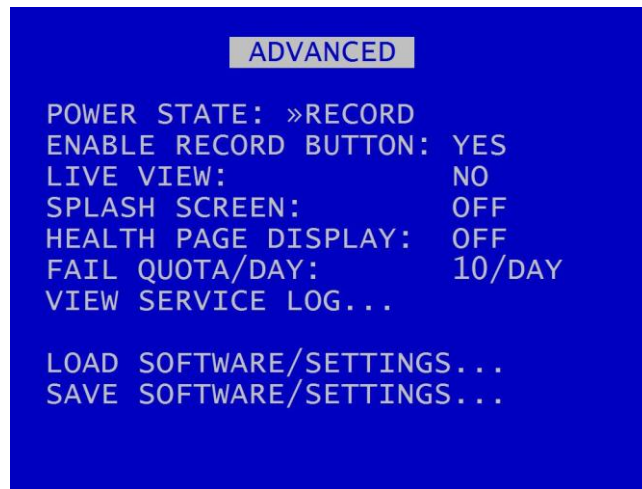
ADVANCED menu contains advanced options that normally do not need to be edited after installation.

POWER STATE – Set if the X300 will RECORD AT POWER UP, DO NOT RECORD or USE LAST STATE. If use last state is selected the unit will record on power up if it was recording when power was disconnected. If it was not recording when power was disconnected, it will return to this state on power up.

ENABLE RECORD BUTTON – controls whether the record button on the front panel of the X300 DVR can be used to start and stop recording (enable/disable). Select from YES/NO.

LIVE VIEW – if set to YES, live view of camera will be displayed even if the disk cartridge is removed. If set to NO and the cartridge is not present, the initialisation screen is shown.

SPLASH SCREEN controls the length of time an operator logo will be displayed. A .bmp file can be loaded / displayed on boot up. The .bmp must be in a specific format and copied onto the cartridge.See Appendix 3 for further details. The Splash Screen can be displayed for a set length of time – choose from OFF, 5SECs, 10, 20, 30, 60 SECS.

HEALTH PAGE DISPLAY – controls the length of time the unit health status will be displayed for on boot up. Select from OFF, 5SECS, 10, 20, 30, 60SECS, UNTIL EXIT.

FAIL QUOTA/DAY – sets how many fail messages that must occur for any given day before the FAIL LED is lit. During normal operation it may be acceptable to receive a certain number of fail events before action is required. Set as applicable. Available options are NEVER, 1/DAY, 2, 5, 10, 20, 50/DAY.

VIEW SERVICE LOG – displays any service messages that have been logged by the system.

LOAD SOFTWARE/SETTINGS – provides options for loading new/upgraded software and/or settings.

SAVE SOFTWARE/SETTINGS – provides options for saving the current settings.

3.4.1   Health Page Display

HEALTH PAGE DISPLAY controls the length of time the unit health status will be displayed for on boot up. The health page includes a simple traffic light status and may include service/fail code conditions as well as the current recording state. The health page can also be activated via an alarm input.

Select from OFF, 5 SECS, 10, 20, 30, 60 SECS, UNTIL EXIT.

3.4.2   Service Log

```
            ┌─────────────────────┐
            │     SERVICE LOG     │
            └─────────────────────┘
      »LOG ENTRY 1 OF 20

            29/10/18 00:00:00

            MODE: Service
            CODE: 0304
          DEVICE: Camera
          DETAIL: NO SIGNAL 4


      RESET SERVICE LOG...
      WRITE LOG TO: HD SD
```

VIEW SERVICE LOG – displays any service messages that have been logged by the system.

Messages can be scrolled through and reviewed. Details of date/time and service/fail codes are shown.

RESET SERVICE LOG – clears the service log.

3.4.2.1   Reset Service Log
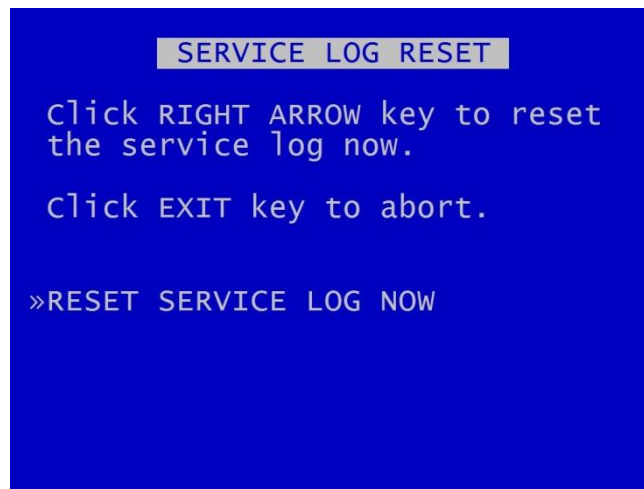
SERVICE LOG RESET menu – clears any service log messages.

Press the right arrow key, and then again to confirm.

HINT: Clearing the service log will clear the front panel service/fail LEDs.

3.4.3 Load Software/Settings

```
       ┌─────────────────────────────┐
       │   LOAD SOFTWARE/SETTINGS    │
       └─────────────────────────────┘

         LOAD FROM:»HD

         LOAD SYSTEM SOFTWARE
          WITH FACTORY SETTINGS
          WITH CURRENT SETTINGS
          WITH XOS SETTINGS
         LOAD MENU SETTINGS
```

LOAD SOFTWARE/SETTINGS menu provides options for loading new/upgraded software and/or settings. An .XOS file should be copied onto the cartridge or SD card using a PC then inserted into the X300. Settings can also be copied from another X300 unit.

LOAD FROM – select HD (to load from the hard disk drive) or SD (to load from the SD card).

LOAD SYSTEM SOFTWARE – select from the options to load software either:

> WITH FACTORY SETTING (load the XOS software with Timespace factory default settings).

> WITH CURRENT SETTINGS (load the XOS software but retain settings as installed in the currently configured DVR).

> WITH XOS SETTINGS (load the XOS software with settings from the HD cartridge or an SD card).

LOAD MENU SETTINGS – used to copy menu settings from another DVR unit and replicate these on the second DVR.

LOAD CONFIG DATA – load eg settings for a new IP Camera via a TSCONFIG file. See IP Camera GROUP SETTINGS menu for more information.

> **WARNING:** Caution should be taken to ensure that power is not lost during an upgrade.

3.4.4   Save Software/Settings

SAVE SOFTWARE/SETTINGS provides options for saving the current settings. The current software and settings will be written to the HD cartridge or SD card.

Select SAVE TO: HD to save to the hard disk drive, or SD to save to the SD card.

SAVE SYSTEM SOFTWARE   – save the .XOS file.

SAVE MENU SETTINGS   – save menu settings to transfer to another unit.   NB: it is possible to save the menu settings and remove parts not required, retaining only the small section which includes the required settings.

SAVE CONFIG DATA   – save the CONFIG data on to either the selected HD or SD card.

4.   System Information And Security

4.1   Language Selection

By default the X300 menu system is displayed in the English language.

Timespace Technology can provide a language template file which the user can translate and return to Timespace Technology for incorporation into the X300 software. This will allow all text displayed on the Reviewer to be in the user's preferred language.

Language is selected in the SYSTEM SETTINGS > RESET menu. The X300 requires a power cycle before the new language settings will take effect.

4.2   Video Standard - PAL and NTSC

The X300 offers the ability to switch between the different video standards, PAL and NTSC.

PAL (Phase Alternating Line) is the standard used in most European countries with the exception of France. The X300, when configured to use PAL, offers a maximum capture rate of 25 images per second (per channel).

NTSC (*National Television Standards Committee*) is the standard used in the United States of America. The X300, when configured to use NTSC, offers a maximum capture rate of 30 images per second (per channel).

When configured to use one of these standards, the X300 must use it exclusively. This means that cameras of different types cannot be mixed on the device's inputs.

Note that if the unit is configured for PAL and an attempt is made to play back NTSC recordings, the image will appear vertically 'squashed'. Similarly, if the unit is configured for NTSC and an attempt is made to playback PAL recordings, the image will be clipped.

To switch between the required video standard, the user must configure the unit using the SETTINGS MENU > SYSTEM SETTINGS > CAMERA SETTINGS > VIDEO SETTINGS menu. Once the selection has been made the unit must be power cycled before it comes into effect. PAL is the default setting.

4.3   File System

The X300 uses a proprietary file type with the file extension .XBA. Images from multiple cameras along with audio, GPS and other meta data are stored in these files. The X300 stores XBA files on the cartridge in a loop over the physical disk and does not use a fragmented file structure. The X300 uses a linking mechanism (FAT area) for PC compatibility. This compatibility conforms to the Microsoft standard FAT32 file system that is compatible on all PCs and many other systems.

Two types of File System behaviour are available on the X300; Loop and Single Pass.

Loop Recording

The X300 will automatically delete the oldest recordings first when the Hard Disk Cartridge is full (with the exception of write-protected files). Write-protection can be used to keep Alarm recordings but loop the background (Normal) recording.

Single Pass Recording

The X300 records until the Hard Disk Cartridge is full and then stops.

Recordings may be deleted in the SETTINGS > SYSTEM SETTINGS > RESET menu or loop recording enabled so that the oldest files will be overwritten first. The File System Recording Mode is set in the SETTINGS > SYSTEM SETTINGS > FILE SYSTEM menu.

4.4   Video Compression

The X300 records images, audio, GPS and other meta data into 1 Minute, 5 minute, 10 minute or 1 hour proprietary format files ending with the .XBA file extension. For security and optimisation reasons .xba files can only be viewed on a PC using the proprietary PCLink200 software or authorised Timespace partner software.

The images are compressed using MPEG2 in Full Update mode. In Full Update mode, each image stands alone in its own right and uses no prediction from previous images. The advantage of full update recording is that each image is independent and free from any inter-image distortion. The images can also be searched easily during playback.

A trade-off between image quality and file size can be made by selecting different levels of video quality on the X300: LOW, MEDIUM, HIGH, V.HIGH, VV.HIGH, SUPER AND SUPD1. The low setting uses greater compression than the higher settings and consequently less disk space is used.

As image quality rises however so does the resultant file size, so a decision has to be made as to the level of image quality needed and the length of recording required to be stored on any given size of Hard Disk Cartridge. The X300 uses a constant bit-rate scheme so every image has a constant average size in bits relating to the quality setting. The following table lists the qualities and the corresponding sizes of image that result:

SUPD1	50KB per image
SUPER	50KB per image
VV.HIGH	42KB per image
V.HIGH	34KB per image ← Transport for London approved quality
HIGH	26KB per image
MEDIUM	18KB per image
LOW	10KB per image

The X300 provides an on-screen calculator during setup when using the Reviewer. It shows how long the recordings will last before they are overwritten. This is based on the current quality, images per second settings and the installed cartridge size.

4.5   Audio

X300 Mark 2 – has two line-level audio inputs and two line level output channels via a 8-pin DIN connector on the rear panel (Figure 12 - X300 Mark 2 Rear Panel). The two input channels record in Stereo. AUDIO RECORDING can be included in Normal Recording, Timer Recording, Alarm Recording and SD Recording.

As the audio inputs on the X300 Mark 2 are line-level, some microphones will require the use of a dedicated preamplifier to raise their very low levels of output to line-level.
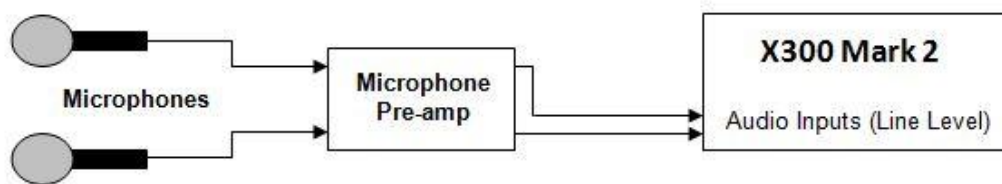
Figure 7 X300 Mark 2 Microphones

X300-16M – has one mic-level audio input via the Molex connector (Figure 15 - X300-16M Rear Connections).   The X300 has a built-in microphone pre-amp.
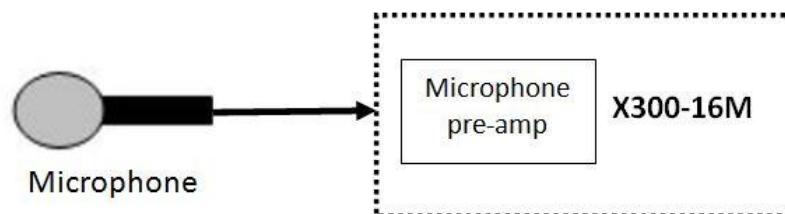
Figure 8 X300-16M Microphone

Playback

The audio channels can be played back when viewing footage in PCLink200 PC software. They can also be disabled during playback.

The Reviewer can also be used for playback via its built-in speaker. The audio signal is carried to the Reviewer via the RJ45 cable, no other connections are necessary.

NB: For the X300 Mark 2, playback via the Reviewer is selectable via channel 1 only, 2 only or 1 and 2.

The X300 is configurable so that the line-level input range can be set from 0.12 – 2.0Vrms (sensitivity).

Audio sampling rate determines how much high frequency content there is in the recording. The X300 sampling rate is selectable – 8.0kHz, 16kHz, 32kHz, 44.1kHz, or 48kHz. NB: 44.1kHz is equivalent to C.D. quality which offers near-perfect reproduction.

The audio sampling resolution determines the amount of noise in a system. The X300's 16 bit sampling rate is CD quality with imperceptible noise, as long as the user sets the recording level to the maximum possible (without clipping) to use the full dynamic range).

4.6   PC Access Precautions

The X300 file system uses a standard FAT32 file system so that a PC can read the contents. The PC will access the cartridges in a different way to the X300. The X300 will not be able to read every FAT32 file system written by the PC and it is therefore important to restrict what the PC does to the file system.

Permitted on a PC

- Reading the .xba files
- Modifying the write-protect status of files
- Performing disk utilities that read the disk (e.g. Scandisk) but do not modify disk

Not Permitted on a PC

All write accesses to the disk if it is to be reused in an X300. These include:

- Formatting the disk on PC (including any Disk Manager MBR checks/fixes)
- Defragmenting the disk
- Deleting files
- Renaming files
- Generating new files
- Creating a recycle bin on the disk

NB: if any of the above non permitted actions are used, the cartridge will need to be reformatted on the X300 using the Reviewer. This will erase all data on the cartridge and format it correctly for further use in the X300.

4.7   PC Network Access

The X300 can be accessed through a number of PCLink Suite Applications, included in the USB Kit. Files can be downloaded, images viewed, X300 controlled and settings adjusted over LAN.

Each feature runs over the LAN using a specific protocol and on a specific network port.

Security measures on a network such as Firewalls, encryption and MAC address filtering may need to be adjusted in order to achieve this. Security applications such as Norton and Symantec on the PC may need to be configured to allow the PCLink Suite applications to operate correctly. Any installed network or local PC firewalls (including Windows Firewall) may have to be instructed to allow the use of these ports to communication between the PC and the X300.

Ports:

Port	Protocol	Function	Used By	DVR	Description
7	UDP	Echo	LANLink / PCLink	All	Unit discovery
21	TCP	FTP	LANLink	All except X200	File download
23	TCP	Telnet	PCLink	All	Unit commands
69	UDP	TFTP	LANLink / PCLink	X200 only	File download
2055-2058	TCP	Custom	PCLink	All except X200	Live video and menu
5465-5468	UDP	Custom	PCLink/RemoteLink	X200 only	Live video and menu

Figure 9 - Network Ports

4.8   Watermark and Sequencing

4.8.1   Watermark

The X300 uses a fragile watermark. Any modification to the recorded file will destroy the watermark.

The image, audio and ancillary (meta) data that makes up the recorded file is passed though a function that generates a "magic number" or hash code from the data. A hash code is created automatically by the X300 every ¼ of a second for each ¼ second of data. Each hash is then passed though an encryption function and then stored in the file.

A sequencing number ensures that all hash codes and corresponding data are present and where multiple files exist that no files are missing.

To check that a number of files have not been altered or modified in any way, the watermark checking program (e.g. PCLink) recalculates the encrypted hashes (watermarks) and checks these against the watermarks provided in the file. If all the watermarks match the recorded file has not been tampered with. The watermark is "destroyed" when the encrypted hash code stored in the file and the encrypted hash code of the data do not match. PCLink produces a report which can be used in court to validate recorded files.

The watermark is always on the X300 i.e. all recordings have the watermark embedded in real-time as the footage is laid to disk, it cannot be turned off. Within PCLink200, you can generate a report for a number of files. You can also select a file for watermark checking.

Encryption type;

- Hashing function: SHA256

- Encryption function: AES256

4.8.2   Sequencing

In addition to every ¼ second being protected by a Watermark, each watermark has its own unique sequence number. This protects any images being removed from a file and protects any files being removed from a sequence of files.

4.8.3　　Watermark / Sequencing Report

Within PCLink200, a report can be produced against an image, file and/or sequence of files.

PCLink will analyse the data against the encrypted hash and analyse the data's sequence numbering. If any images have been modified, any images removed or any files removed, PCLink will identify them and report accordingly.

Files fail if:

- Any video/audio/meta data frame (other than the last in a non-closed file) had an invalid watermark

- Video/audio/meta frames were missing or out of sequence (in newly generated files)

- Files passed to the checker were not in sequence (in newly generated files)

- Files are missing their sequence frame (in newly generated files) in properly closed files.

- Time Adjust TCP port 8463 (can be configured within the X300 menu system).

Authentication

FTP / Telnet username; tspace01
FTP / Telnet password; TS01480

5. System Interfaces

5.1   GPS

The GPS menu screen is covered in Chapter 3 – User Guide – X300 Menu System - <u>GPS</u>

The X300 GPS menu options allow the embedding of GPS position and speed, assuming a valid GPS signal is being received and the data passed correctly to the X300.

If a GPS receiver is connected but satellite lock has been lost then it is still possible to record the data but it will not indicate position, speed, date or time and the actual content may vary according to the type of GPS receiver employed.

The X300 Digital Video Recorder includes a clock which is used to timestamp recording files and overlay the date and time on recorded images. Although accurate, the X300 can be configured to synchronize the clock with the date and time information received from the GPS receiver.

When a GPS unit is plugged into the X300, and it has locked onto the satellites it then sends GPS time and position and other data every second. If after 10 seconds the X300's internal clock is consistently +/- 2 seconds compared to the GPS unit then the time error is noted. On the next power cycle the time error is corrected.

Local Standard Time - The time received from the GPS receiver is always UTC (Coordinated Universal Time) which is the same as GMT (Greenwich Mean Time). In order to correctly work out the error between the local standard time (used by the X300's internal clock) and that received from the GPS receiver, the system must be set with the correct time zone offset.

GPS Baud Rate - Set the X300 data rate according to the GPS module you are using. Rates configurable include; 2400, 4800, 9600 and 19200, 38400 bps.

NB: It may be necessary to change the baud rate on the GPS module and set it to a specific rate in line with the X300 setting. Reference the GPS module product instructions to configure the baud rate then power off/on the X300 (whilst connected to the GPS).

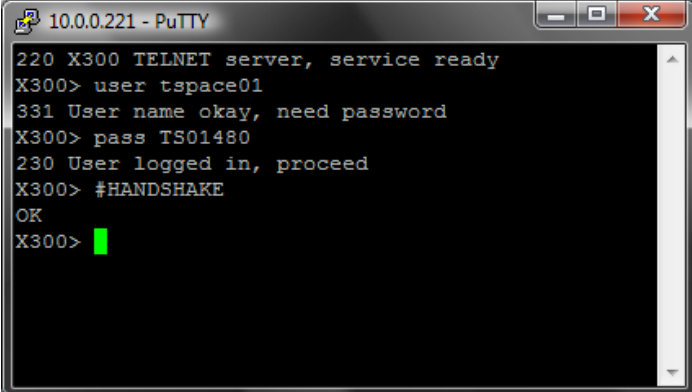## 5.2   Remote Operation (LAN / Wifi / 3G) – Telnet / FTP

The X300 system provides a number interfaces to remotely control and configure the recorder as well as reviewing recorded footage and displaying live camera views.

The X300 has a comprehensive set of **RS232** control commands that run over the **Serial** port. This open architecture allows full integration with third party hardware/software. Refer to the RS232 Control section of this manual for details.

In addition to the RS232 support, the X300 provides a **Telnet** interface over TCP/IP. The same command set detailed in the RS232 section can be used over ethernet using the Telnet protocol.

A simple test to check connectivity between PC and X300 you can try following with a Telnet client (e.g. Putty, Termite);

- Telnet (port 23) to 10.0.0.200 (default X300 IP)

- Enter the username; tspace01

- Enter the password; TS01480

- Type **#HANDSHAKE**; you should receive **OK**.

The X300 supports **FTP** over TCP/IP using the Ethernet (LAN) socket. The FTP/Telnet User Password menu screen is also covered in Chapter 4 – X300 Menu System.

The X300 FTP server allows video files to be downloaded using either a hard-wired, wireless or 3G IP connection. A web browser can be used to FTP onto the X300 by typing the following in the address bar:

ftp://user01@10.0.0.200/ (default IP). This will prompt for the password.

ftp://user01:TS01480@10.0.0.200/ (default IP). This will log straight in.

Supported browsers are: Google Chrome, Microsoft **Internet Explorer** & Mozilla **FireFox**. A third party FTP client can also be used, for example **FileZilla**.

PCLink Remote features include; *Live View, Playback, Configuration***.** A brief overview of the applications included in PCLink Suite can be found on the PCLink Suite page of this manual. For detailed application instructions, see the separate PCLink Suite manual available here at www.tspace.co.uk.

5.3   RS232 / TELNET External Control

The X300 software includes external control via an <u>RS232</u> serial port (end panel connector) or via Telnet over Remote Live View and provides functions:

▪ Files can be created and written into on the X300 hard drive. The files can also be read back.
▪ The X300 can be controlled via Commands. This allows many displays and recording functions to be carried out by an external device.

Baud rates can be set in the <u>GSM REMOTE</u> menu. Baud rates of 2400, 4800, 9600, 14400, 19200, 38400, 57600, 115200 can be selected. The external commands operate over the RS232 port. The commands can be found in APPENDIX 4 – Tokens / Protocol.

Connect the X300 RS232 port to a PC using a serial cable. Some modern PCs do not come with a serial port, you can however use a USB Serial Adaptor. An adaptor that we have tested here is:

▪ FTDI - FT232R – www.ftdichip.com

The COM port number will vary depending on your PC and which cable you have. For example on a laptop the NEWLink cable was assigned COM10.

5.4   USB Interface Kit

The purchase of Timespace USB Kit or cartridge station includes the necessary licence for use of PCLink Suite software including free of charge updates on a single PC (reasonable use policy allows installation on a secondary portable PC; laptop). Timespace Technology does not authorise the unlicensed usage of PCLink Suite software.

The USB Kit provides all hardware and software necessary to review and archive recordings on a PC from a Hard Disk Cartridge when it has been removed from the X300 Digital Recorder. No additional device drivers are required for the USB Interface Kit when using Windows 2000, XP, Vista, Windows7 or Windows 10.

Kit Contents:

▪ 1x USB / IDE Interface Lead
▪ 1x PCLink200 Software CD

Connecting to a PC using the USB Interface Kit

1. Remove the Hard Disk Cartridge from the X300.
2. Plug the multi-pin D shaped IDE USB lead into the rear of the cartridge and then plug the smaller USB connector into an available USB port on the PC.

Once the disk has been connected, the PC should take a few seconds to detect the disk and Windows should automatically assign a drive letter to it. The drive should be viewable in Windows Explorer with .XBA files visible with their associated icon (assuming PCLink Suite is installed);

Recording files can now be viewed using PCLink200;

- Individual files can be opened directly from Windows Explorer by double clicking.
- Up to 15 files can be opened by selecting them and using RIGHT CLICK > OPEN WITH PCLINK200.
- .XBA files can be dragged from a Windows Explorer window and dropped onto the main area of the PCLink200 window.
- The entire cartridge can be loaded by opening PCLink200 and selecting the AUTOLOAD option.

A specific folder can be loaded from within PCLink200; FILE menu, LOAD FOLDER

6. Installation Guide

6.1   Safety

The X300 meets the requirements of BS EN60950 (Safety Requirements of Information Technology Equipment).

The X300 is designed to be powered from an external power source which complies with the Low Voltage Directive (2014/35/EU).

The X300 is designed for indoor use in the temperature range 0° to +50°C, 10% to 90% RH (non-condensing).

6.2   Environmental

The X300 may be operated in ambient temperatures from 0°C to +50°C. This specification applies in still air and ambient temperature measured 15cms above the centre of X300.

If the X300 is to be mounted in an enclosure is important that the internal temperature inside the enclosure does not exceed the specification above and any new enclosure design should be tested.

6.2.1   Shock And Vibration

Consideration should be paid to the mounting position so that the levels of shock and vibration that may be encountered are minimized.

6.2.2   EMC

The X300 complies with the relevant EEC, Automotive 'E' Mark and EMC standards for this type of product.

6.2.3   Conformity

 Conformity certificates can be found in APPENDIX 2 – Certificates of conformity and type approval.

6.2.4   Recycling

When the product has reached its end of life and requires disposal, recycling instructions are available upon request.

6.3   Warnings

- **The use of hard disk cartridges other than those supplied by Timespace Technology will invalidate the warranty of the X300 recorder and will constitute a breach of the X300 operating software copyright.**

- **The purchase of the Timespace USB kit includes the necessary license for use of PCLink Suite software on one PC, including free of charge updates. Reasonable use allows a second installation on a portable computer provided both installations are not used simultaneously. Timespace Technology does not authorise the unlicensed usage of PCLink Suite software.**

- **The X300 recorder must always be mounted so that there is a free flow of air around it. If it is mounted in an enclosure, it is essential that adequate ventilation is provided, and it is recommended that a fan is incorporated in the enclosure design. See further details for the X300 Mark 2 and the X300-16M.**

- **Hard disk cartridges are sensitive to shock, vibration and humidity and must be used within operating temperature range as detailed in the X300 specification in the Appendices.**

- **It is highly recommended that recording is stopped before power is removed from the X300 to avoid loss of data. It is also recommended to stop recording before the cartridge or SD card is removed.**

- **Cartridges should be safely removed from windows operating system environment prior to removing power/USB cable. Data loss or corruption may occur if this is not followed.**

- **Do not wet the product when cleaning.**

- **This product contains a lithium battery. Do not recharge, open, heat or dispose of in fire. Dispose of according to local regulations.**

- **X300 may become unusable if power to the unit is lost during a software upgrade.**

6.4   X300 Connections

6.4.1   X300 Front Panel

Figure 10 - X300 Front Panel

RECORD BUTTON
Turns configured recording mode on and off. Button can be disabled within menu settings.

LEDs

Pwr	Illuminated when the X300 is powered (Green LED).
Record	Illuminated Red when the X300 is recording (flashing when in Motion Detect mode).
Disk	Pulses Green/Red when the X300 is reading/writing to/from the Cartridge or SD card
SD	Pulses Orange when the X300 is reading/writing to/from the SD card.
Fail	Illuminated Red when any of the Fail conditions are met (refer to Service / Fail page).
Service	Illuminated Orange when any of the Service conditions are met (refer to Service / Fail page)
At Power On	All LEDs will illuminate whilst the X300 initialises and will remain lit during system check (menu disabled) until the unit is operational. Once operational only the Pwr LED will remain illuminated unless recording is taking place.

🔒 **CARTRIDGE LOCK**

Locked   - Securely locks the removable cartridge in place and enables it for use.
Unlocked   - Turns off the cartridge, releasing it for removal.

SD CARD

The X300 supports a single SD card for two configurable functions:

Dual Recording - The X300 menu settings can be configured to record up to 25 images per second to the SD card in addition to primary images per second being recorded to the cartridge. All additional data for example audio and GPS are also included within the SD recorded files.

File Download   - Files that are recorded on the X300 Cartridge can be selected and copied to the SD card for review on a PC.

SD Card Compatibility -The X300 supports SanDisk SDHC Ultra or Extreme cards. Sizes include 4GB, 8GB, 16GB and 32GB. Both 15 and 30MB/s SD cards are compatible however for best Audio playback results, 30MB/s is recommended.

6.4.2   Reviewer Connector

Figure 11 - X300 with Reviewer

Connect the Reviewer to the X300 Reviewer socket using a RJ45 cable. Signals for this connector are as follows:

1	Video out	5	RS232 Tx
2	Video ground	6	Audio out (line level)
3	Audio ground	7	Power ground
4	RS232 Rx	8	12V

The 12V is supplied to the Reviewer from the X300.

NB: using greater than 12V may damage both the X300 and the Reviewer. **Never** connect a laptop or PC to the front panel Reviewer socket; this will damage the laptop/PC.

6.4.3   X300 Rear panel, common connections

RS232 SERIAL PORT CONNECTOR

9 way male D-type connector (DB9) which can be used to support 1 or 2 RS232 peripherals.

PIN	TYPE	I/O	TYPE
3	TD, Transmit Data	>	Serial Data
2	RD, Receive Data	<	Serial Data
7	RTS, Request to send	>	Handshaking
8	CTS, Clear to send	<	Handshaking
4	DTR, Data terminal ready	>	X300 outputs 5V
6	DSR, Data set ready	<	Ignored by X300
1	DCD, Data carrier detect	<	Detect modem status
9	RI, Ring Indicator	<	Ignored by X300
5	GND, Ground		

> X300 output

< X300 input

Using a conventional cable (DB9 male to DB9 female straight through (1-1, 2-2, 3-3 etc.)) the X300 can be connected to a modem. Alternatively, two RS232 peripherals such as GSM modem and GPS device can be connected simultaneously. Here is an example of the wiring;

PIN	TYPE	I/O	TYPE
Device 1 (Modem)			
3	TD, Transmit Data	>	Serial Data
2	RD, Receive Data	<	Serial Data
7	RTS, Request to send	>	Handshaking
8	CTS, Clear to send	<	Handshaking
1	DCD, Data carrier detect	<	Detect modem status
5	GND, Ground		
Device 2 (GPS)			
4	5V, Supply (500mA max)		
9	GPS in		
5	GND, Ground		

> X300 output

< X300 input

INPUT/OUTPUT CONNECTOR

10 way screw terminal block.
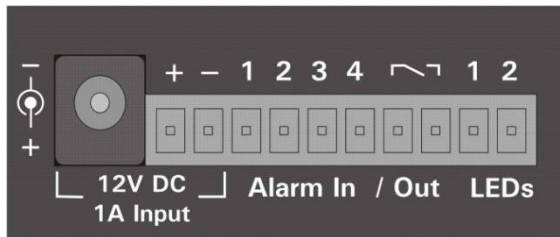
The X300 requires 12V regulated power. This can be applied to either via 12V DC jack socket or 12V screw terminals. **NB:** Do not use both power inputs simultaneously.

Connect alarm inputs 1, 2, 3 and 4 to - terminal if closed or for open circuit leave open.
Connect alarm output to Out terminal pair.   Extra high current solid state relay used for the Alarm Out which can switch a 4A load. This can be used to turn power off to cameras, before the unit goes into low power mode.

Connect LED 1 between + and terminal LED 1, including a series resistor to limit current.
Connect LED 2 between + and terminal LED 2, including a series resistor to limit current.
Terminals LED 1 and LED 2 are high impedance (LAMP/LED off) or 0V (LAMP/LED on)
LED outputs 1 and 2 can be menu assigned to duplicate any of the 4 front panel LEDs (power, record, service and fail).

ETHERNET CONNECTOR

Connect via a standard RJ45 Ethernet cable (straight i.e. pins 1-1, 2-2, 3-3 etc.) to Ethernet hub, switch, router, wireless LAN adaptor or 3G modem.

Internal Connections: 1 Tx+, 2Tx-, 3 Rx+, 4 NC, 5 NC, 6 Rx-, 7 NC, 8 NC

The RS232 and 25 way D-type connectors use a 4-40 UNC Thread type Jack Posts. Farnell PN: 2099517:

If necessary to fit this as a replacement part, fit the post without the nuts and washers.

6.4.4   X300 Mark 2 Rear Panel (January 2016 onwards)

Figure 12 - X300 Mark 2 Rear Panel

All X300s manufactured from January 2016 onwards have additional connections on the Audio DIN socket for CAN (H & L, J1939) and ALARM 5 (typically used for ignition on a vehicle).

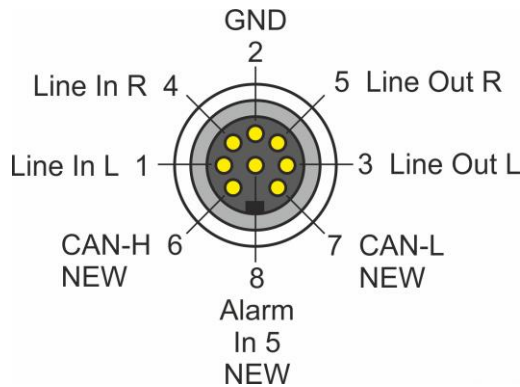**AUDIO CONNECTOR**; 8 pin 180° female DIN connector (Farnell part no. 1193800)

Figure 13 - X300 Mark 2 Audio Connector

All 5 alarm inputs have voltage measurement and a settable voltage threshold. This eliminates the need for a relay alarm interface board in vehicle applications.

6.4.5   X300-16M Rear Panel (August 2018 onwards)

Figure 14 - X300-16M Rear Panel
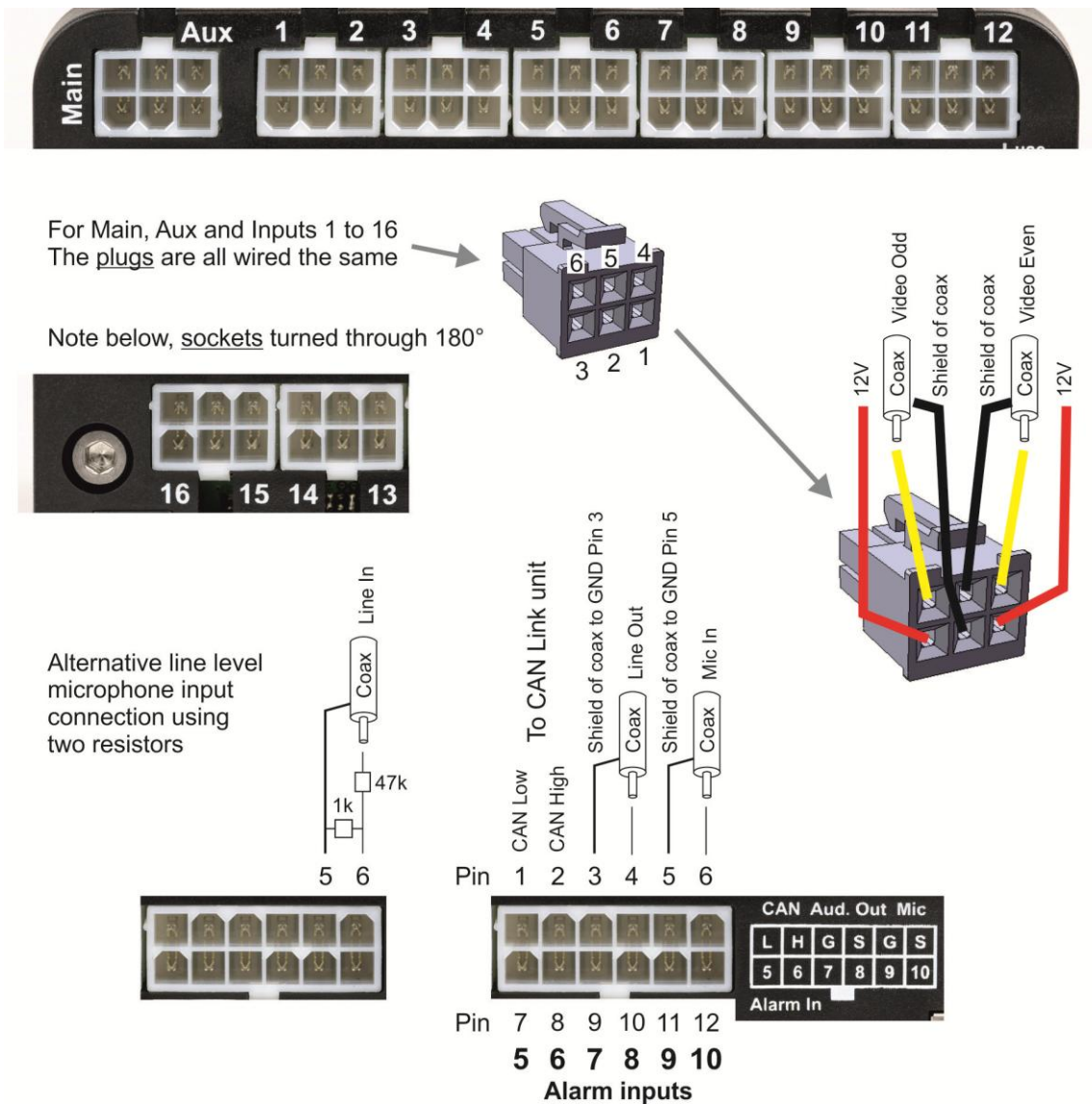
Figure 15 - X300-16M Rear Connections

6.5   Installation Instructions

The X300 Mark 2 is supplied without any mounting kits. It can be used free-standing or it can be mounted using the 4 x threaded holes on the underside - mounting screw size M4, 0.7 Pitch, 12mm). Timespace can also supply 2 different vehicle mounting system kits if required.

The X300-16M is supplied pre-mounted on the Timespace Vehicle Mounting Plate System. This can then be screwed to the vehicle's mounting surface as required.

The X300 requires 12V regulated power. This can be applied to either via 12V DC jack socket or 12V screw terminals.

> **NB:** Do not use both power inputs simultaneously. Cameras and other external equipment should be connected / wired to the X300 before power is applied.

X300-16M only - the built-in GSensor must be configured during the installation process. Once the X300 is installed, the direction of the front and side panel must be set in the GSensor setup menu e.g. Front panel FORWARDS means the X300 front panel is facing the front of the vehicle, therefore the Connector Panel must be either LEFT, RIGHT, UP or DOWN depending on the mounting position. After configuring the X300 orientation, the GSensor readings must be zeroed using ZERO THE ACCELEROMETER in SYSTEM SETTINGS > GSENSOR > GSENSOR SETUP > ZERO THE ACCELEROMETER.

> **NB:** the X300 (Mark 2) does not have a built-in GSensor. A separate unit can be fitted, contact your supplier for further details.

6.5.1   Installation Checklist (Example)

REQUIRED / RECOMMENDED

Mount the X300 in position

(X300-16M only) Set the GSENSOR orientation (which way is the X300 mounted?)

(X300-16M only) Zero the GSENSOR readings

Setup camera rate/quality as required e.g. NORMAL RECORDING

Setup the ALARM INPUTS for ignition, indicator L/R, brake, reverse, other…

Set POWER STATE to RECORD

Set ENABLE RECORD BUTTON to NO

OPTIONAL

Setup the SD RECORDING parameters if SD is being used (format SD card)

Enable AUDIO and set the sensitivity (if mics being used)

Setup the VIDEO OUTPUT for MAIN and AUX to display camera output

Add vehicle ID/Registration/other preferred text to the CAMERA TEXT

Connect to GPS and/or WiFi router as required.

6.5.2   Mechanical Data

(Measurements shown in mm)

X300 Mark 2
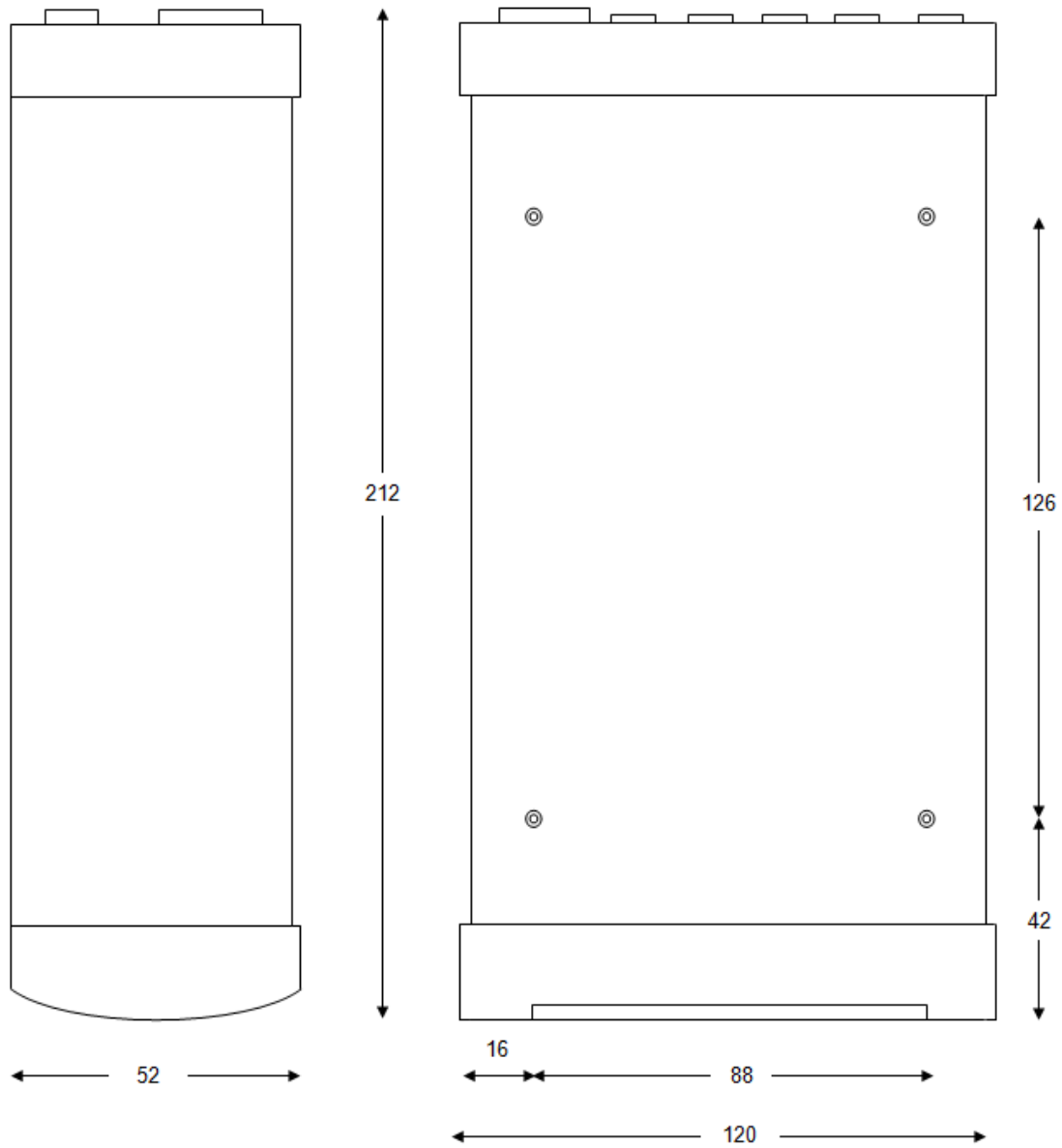
Figure 16 - X300 Mark 2 Mechanical Data
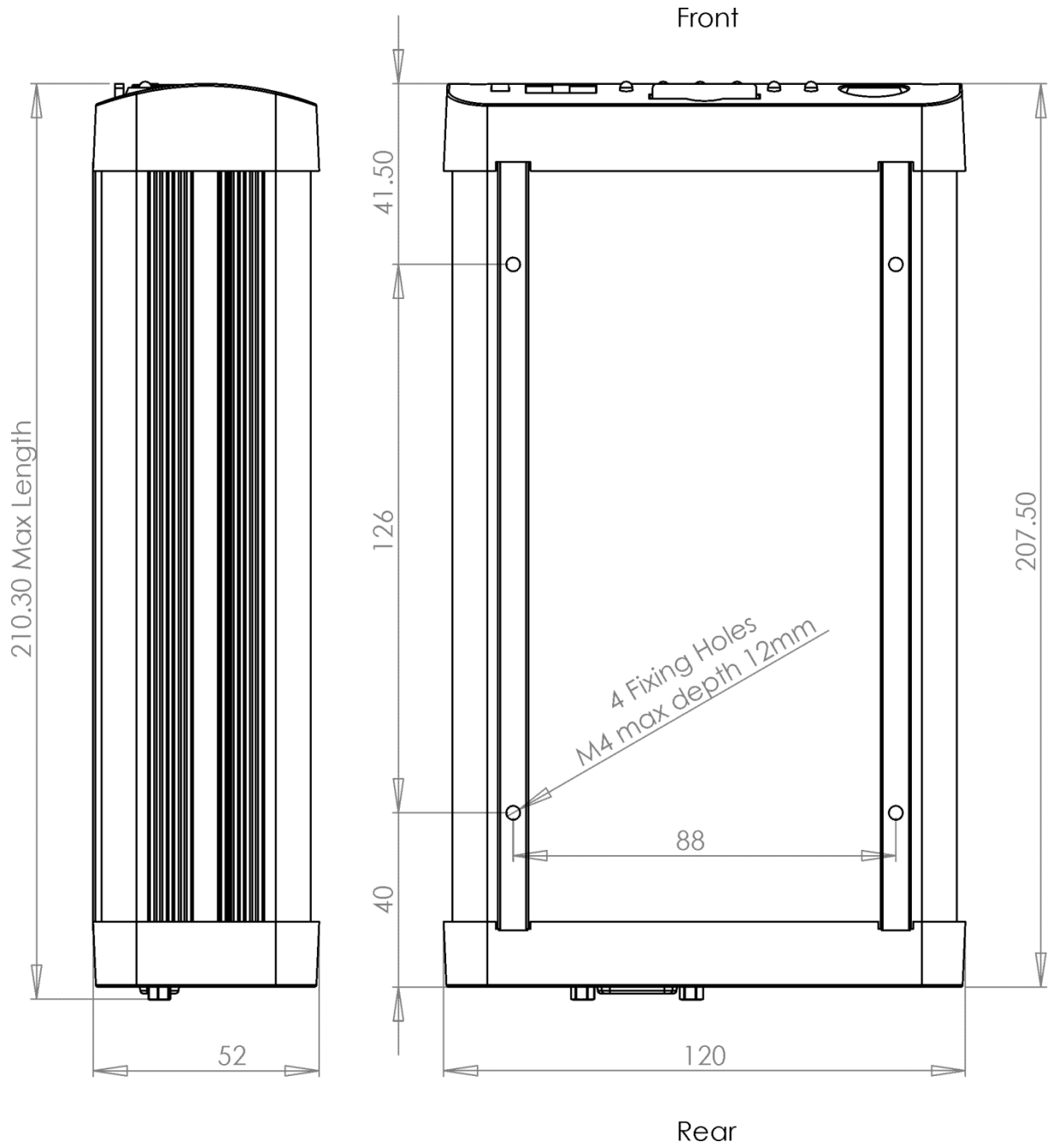
X300-16M

Front

Rear

Figure 17 - X300-16M Mechanical Data

6.5.3   Mounting Kits

The X300-16M comes pre-mounted on the Timespace Vehicle Mounting Plate System.

The X300 Mark 2 is delivered un-mounted. Timespace can provide 2 different kits for mounting the X300 Mark 2 in mobile installations subject to shock and vibration. Please adhere to the following instructions for the installation of the mounting kits, as failure to do so may result in the kits not working correctly.

6.5.3.1   Timespace T408 Vehicle Mounting System

Quantity	*Description*
4	Wire Rope Mounts
1	Stabiliser Coupling
8	M4 x 12mm Counter-Sunk Hex-Head Screws

In addition you will require a standard 'L' shaped hex key. This is essential, as when all of the other screws have been tightened, there is no room for any other tool to tighten the front lower pair of screws.

Mounting Hole Preparation

Drill four mounting holes to attach the Wire Rope Mounts. If you intend to use the M4 x 12mm screws into blind holes, then the holes will have to be drilled and tapped to accept an M4 screw, with a thread depth of no less than 8mm.

If mounting the Wire Rope Mounts through a metal plate, then longer screws may have to be used in order to allow a washer and nut to be attached on the other side of the plate. The length of these screws will have to be chosen depending on the thickness of the plate and the height of the washer and nut.

Please note that any screw used for mounting the wire rope mounts to an enclosure surface must have an M4 thread and have a counter-sunk hex-head.
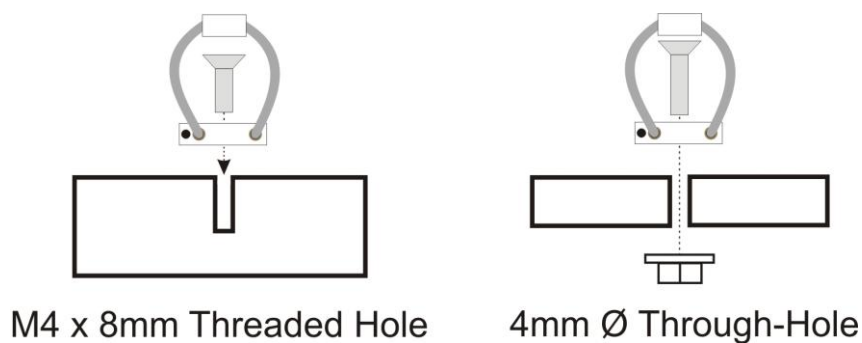

Figure 18 - Vehicle Mounting System - Mounting Hole Preparation

Mounting Hole Location

The mounting holes must be drilled on 126mm and 88mm centres (see Figure 16 - X300 Mark 2 Mechanical Data).

Installation Procedure

It is advised that some form of thread-lock compound should be used on the screws securing the wire rope mounts to both the X300 and mounting surface. This is in order to prevent loosening due to vibration. WARNING - Ensure only a small amount of adhesive is added to the screw points. Excessive amounts will leak onto the circuit board and damage components.

Attach the Wire Rope Mounts to the X300 with four of the countersunk M4 hex-head screws provided and L-shaped hex key. When attaching the rear pair of mounts please ensure that the stabilizer is 'sandwiched' between the mounts and the X300 by aligning the stabilizer holes with the mounting holes in the X300.

Please note that the 'open' end of the C-shaped plastic stabiliser should be attached to the rear wire rope mounts and face backward – see Figure 19 - Wire Rope Mounts below.

Once all of the Wire Rope Mounts have been securely attached to the X300, use a pair of countersunk M4 hex-head screws to attach the bottom 'feet' of the front Wire Rope Mounts to the mounting surface/enclosure.

Secure the lower 'feet' of the rear Wire Rope Mounts to the mounting surface/enclosure using the remaining pair of countersunk M4 hex-head screws and a standard L-shaped hex key. Ensure that the stabilizer is 'sandwiched' between the lower feet and the mounting surface/enclosure by screwing through the Wire Rope Mount feet, then the stabilizer and into the mounting surface/enclosure.
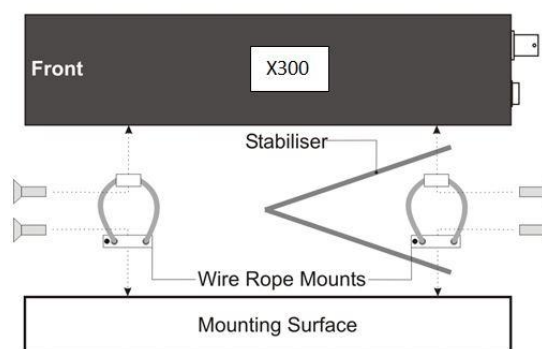

Figure 19 - Wire Rope Mounts

X300 Mark 2 – Final Mounted Clearance Required

It is necessary to allow a clearance of at least 15mm around the body of the X300 when mounted on the Vehicle Kit. This is to allow free movement of the X300 on the anti-vibration mounts and to prevent collision with either the enclosure or peripheral systems due to vertical and lateral movement under extreme shock and vibration conditions.

6.5.3.2   Timespace T907 Vehicle Mounting Plate System

Inventory of parts

Qty   Description
4   Wire Rope Mounts
1   Latching plate with pre-drilled holes
1   Base plate with pre-drilled holes
1   M8 bolt with shake-proof washer
8   M4 x 12mm Counter-Sunk Hex-Head Screws

In addition you will require a standard "L" shaped hex key or a ball-nose hex driver.

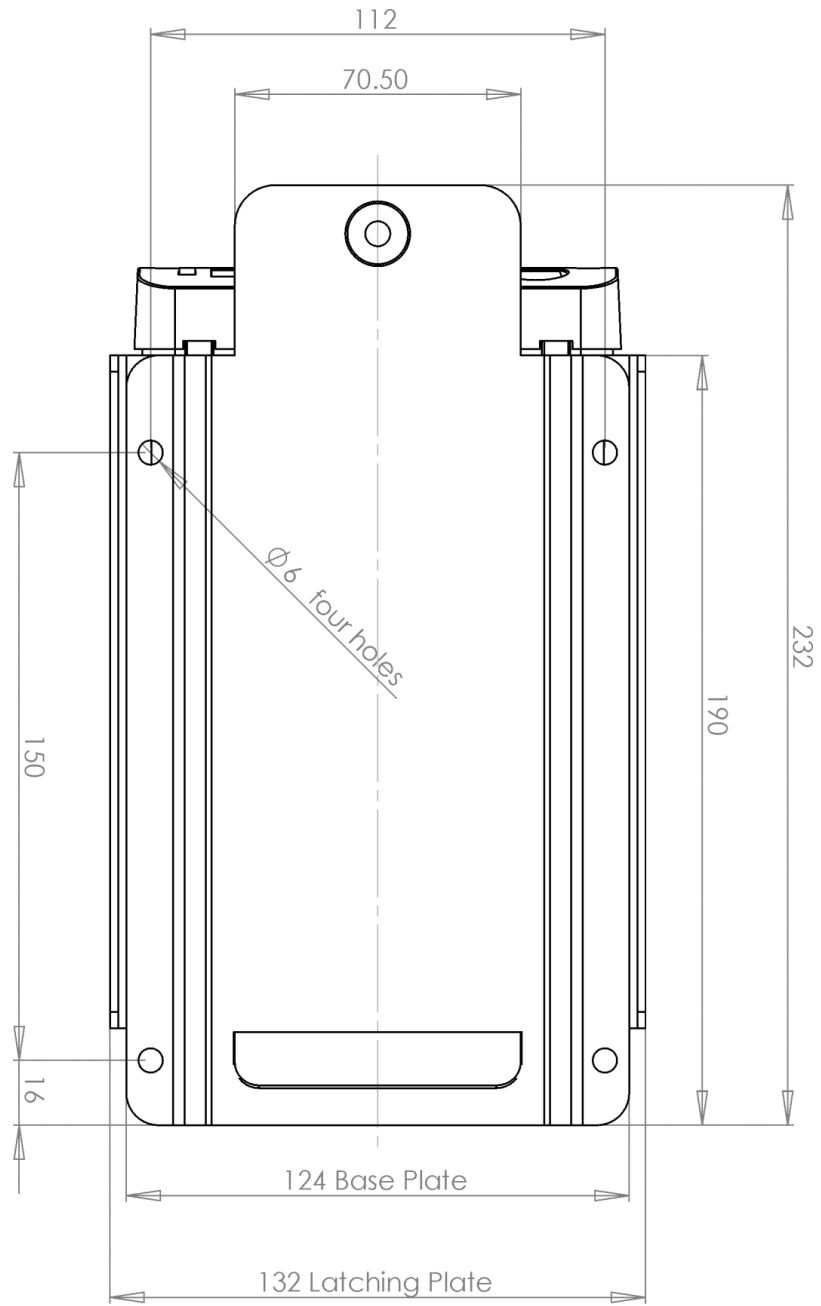**Figure 20 – Timespace Vehicle Mounting Plates System Parts**
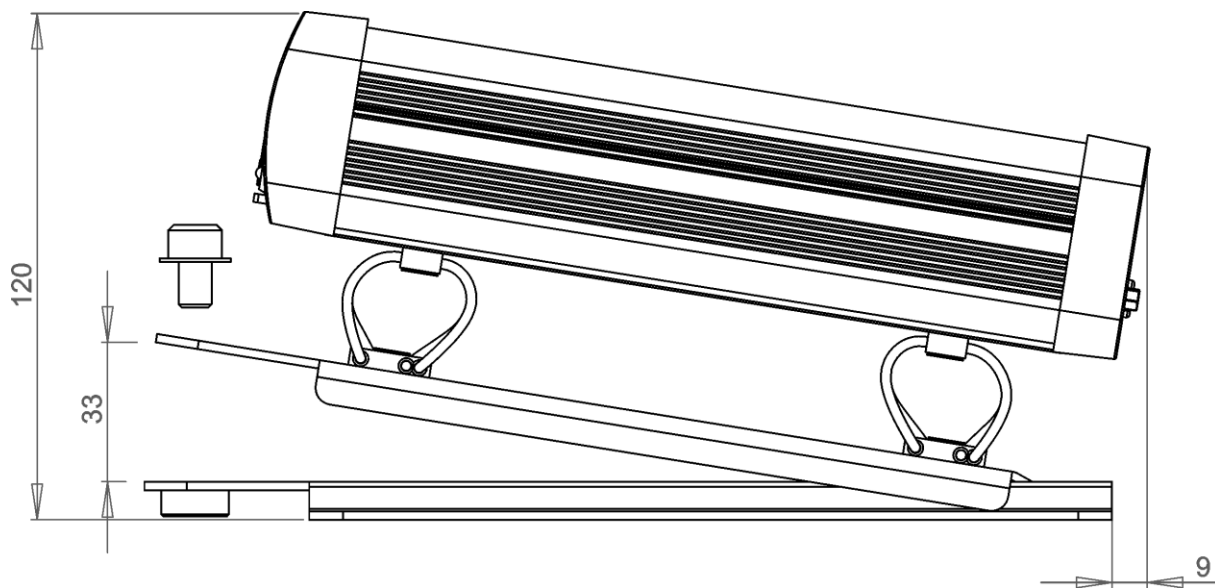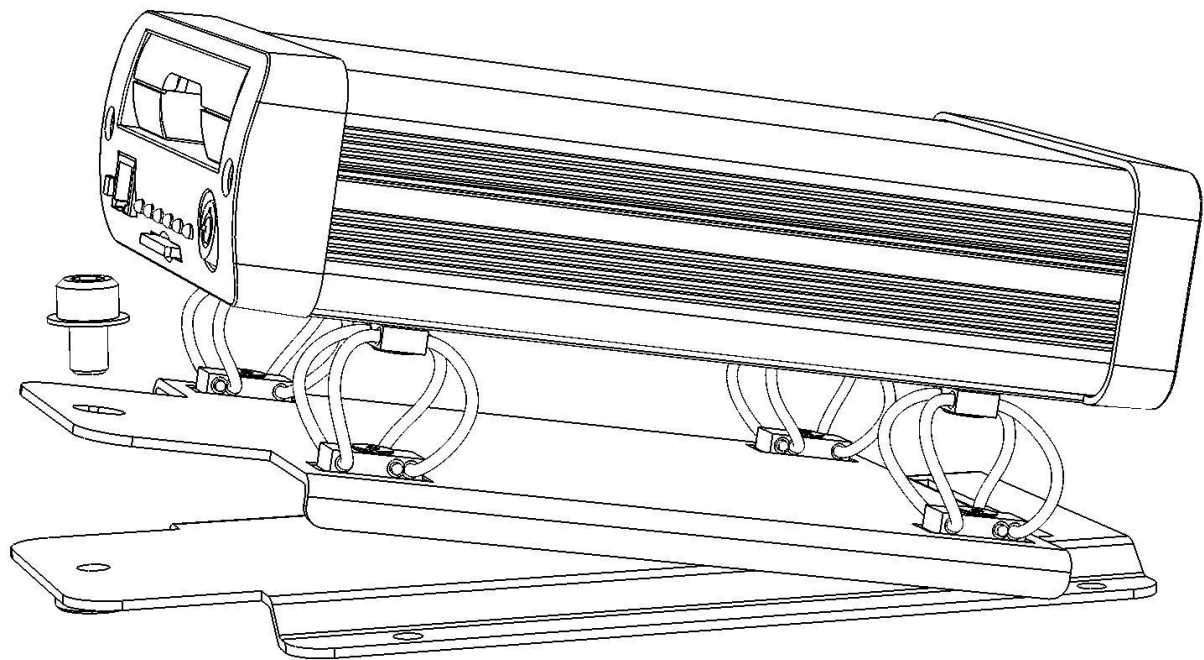
Figure 21 - Vehicle Mounting Plates Mechanical Data

Figure 22 - X300 Vehicle Mounting Plate System - unscrewed
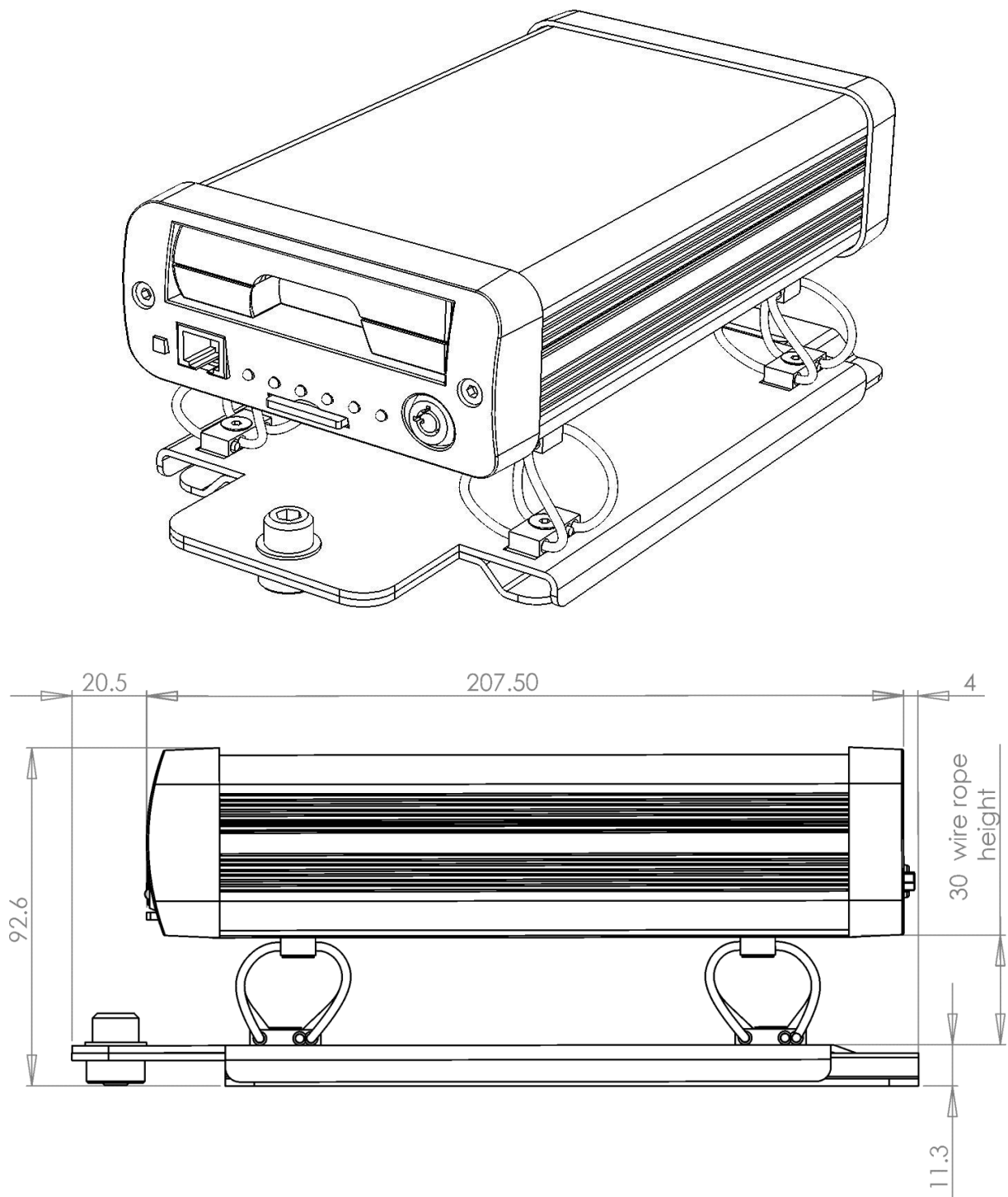
Figure 23 - X300 Vehicle Mounting Plate System - screwed down

Installation Procedure

It is advised that some form of thread-lock compound should be used on the screws securing the wire rope mounts to both the X300 and mounting surface. This is in order to prevent loosening due to vibration.

WARNING - Ensure only a small amount of adhesive is added to the screw points. Excessive amounts may leak onto the circuit board and damage components.

1. Attach the wire rope mounts to the latching plate with 4 of the countersunk M4 hex-head screws provided and a hex key. See Figure 24 - Attaching the latching plate to the X300-16M below for the correct orientation of the latching plate.

2. Attach the latching plate to the underside of the X300 DVR unit with the remaining 4 screws.

   It is recommended that this is done with the X300 inverted on a flat surface – see Figure 24 - Attaching the latching plate to the X300-16M below. (The additional holes in the latching plate can then be used to insert the tool from above to access the screws below).

Figure 24 - Attaching the latching plate to the X300-16M

   NB: ensure that the front of the latching plate is at the front of the X300 unit – see above and Figure 26 - X300-16M mounting plate screwed down.

3. The rear of the latching plate has a wide metal peg – slot this into the hole at the rear of the base plate – see below. The front of the latching plate can then be screwed down into the base plate using the M8 bolt – see below.

Figure 25 - X300-16M mounting plate - Inserting the peg into the base plate

Figure 26 - X300-16M mounting plate screwed down

888888888888

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6.5.3.3   Cable Installation

Please note that when installing cables to the rear of any model of the X300 it is important not to arrange or clamp them in such a way as to impede the free movement of the rear anti-vibration mounts.

Figure 28 - Cable Installation Example

6.5.3.4   Orientation of unit

The X300 should be mounted in a horizontal orientation. This is strongly advised for maximum vibration and shock isolation.

If it is not possible to mount the X300 in the horizontal orientation, then a vertical orientation may be used. It must be noted however that this vertical orientation is not as effective at isolating the X300 from vibration and shock as the horizontal orientation.

The X300 must never be mounted by hanging it upside down from a horizontal surface when using this mounting system.
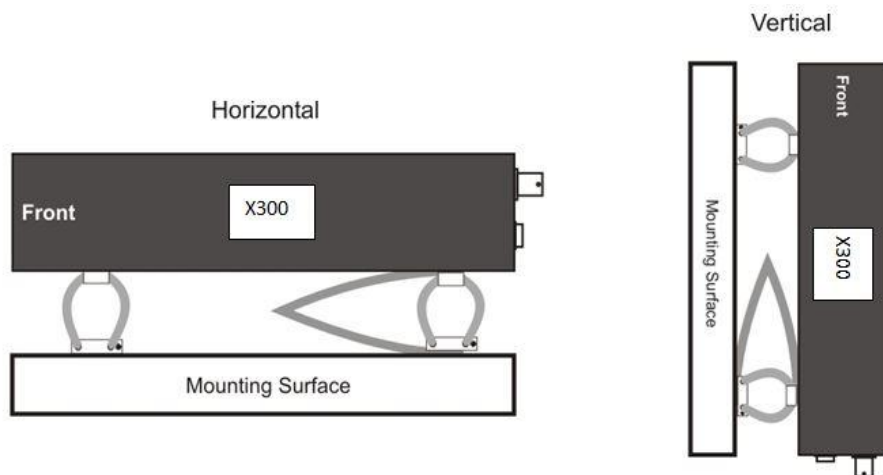
Figure 29 - Mounting Orientation Example

6.5.4   Installation Spare Parts List

6.5.4.1   X300 – all models

Power Connector
2.1mm jack socket (requires 2.5 x 5.5 x 9.5mm DC); Farnell part no. 224923.
Right angle 2.1mm jack socket; CPC part no. AV15499.

Green Block
Input/Output connector; Farnell part no. 9632794.

9 WAY RS232
Farnell 1099052 Multicomp

6.5.4.2   X300 Mark 2 (4-channel) only

Audio/CAN Connector – Lumberg part no. SV81, Farnell part no. 1321483

6.5.4.3   X300-16M only

Video, Audio and CAN

	Molex PN	Farnell PN	RS PN
MOLEX CONNECTOR			
12 Way Molex Mini-Fit JR Plug	39-01-2120	151-871	484-1085
6 Way Molex Mini-Fit Jr Plug	39-01-2060	151-868	484-1760
Crimp Sockets for the above Molex (for wire size 18-24AWG)	39-00-0039	973-2195	172-9134
Crimp Tool (16-24AWG)	63819-0900	160-2636	501-083
Extraction Tool	11-03-0044	525-080	215-5900

7. Service And Maintenance

7.1   Maintenance

There is no requirement for regular maintenance or returning the DVR to Timespace Technology. There are no user-changeable parts in the DVR. The battery in the X300 is designed for a life in excess of 15 years.

7.2   Service And Fail LED

The Service and Fail LEDs on the X300 front panel give a positive indication that a system fault has occurred.

If the Service LED is lit then the system will most likely be functional but may not be performing as intended. An example may be one of the cameras has failed.

If the Fail LED is lit then the system will not be functioning and requires immediately attention. An example may be that the hard disk cartridge has failed.

The Service/Fail conditions are stored on the X300 for review. Each condition has an identifiable code and associated description. The service log can be viewed here; SETTINGS MENU > ADVANCED > VIEW SERVICE LOG menu.

The LED will remain lit and the problem which caused the Service LED to light will be listed in the log until the log is reset by selecting RESET SERVICE LOG.

A full list of Service Codes is in the table on the next page.

7.3   Service Codes

SERVICE CODE / NUMBER		DESCRIPTION
SERV_CAMOPEN	1**	No current on power input to camera ** and no camera signal.
SERV_CAMSHORT	2**	Over-current on power input to camera ** and no camera signal.
SERV_CAMSIGNAL	3**	Camera disconnected for cameras 1-16 => codes 301-316.
SERV_CAMTYPE	4**	Check camera 1-16 => codes 401-416.
SERV_CAMDISC	811	Camera disconnected for camera.
SERV_HDDSMART	812	S.M.A.R.T Info.
SERV_LOWFPS	813	FPS lower than threshold.
SERV_TIMEERROR	815	Time error.
SERV_RTC_ERROR	816	RTC battery fail.
SERV_CHECKSIM	817	Modem send error - check simcard.
SERV_DIAL_OUT_FAIL	818	Modem error - dial out failed (image over gsm).
SERV_SMTP_FAIL	819	Failed to send email.
SERV_MAIN_VOUT	820	Incorrect voltage on Main video output.
SERV_AUX1_VOUT	821	Incorrect voltage on Aux1 video output.
SERV_AUX2_VOUT	822	Incorrect voltage on Aux2 video output.
SERV_AUX3_VOUT	823	Incorrect voltage on Aux3 video output.
SERV_EXT_LOG	835	External control log (ext command).
SERV_CAMDISC_REPEAT	840	Intermittent camera connection.
SERV_USR_RESET	863	Log reset by user.
SERV_HDD_DELETE_FILES	864	Operation to delete all recording files on HDD did not complete.
SERV_HDD_SECURE_WIPE	865	Secure disk wipe on HDD did not complete.
SERV_SD_DELETE_FILES	866	Operation to delete all recording files on SD did not complete.
SERV_SD_SECURE_WIPE	867	Secure disk wipe on SD did not complete.
SERV_BRIDGE_ALERT_NC	868	Bridge Alert controller is not connected.
SERV_UNSAFE_SHUTDOWN	870	Unit was not shutdown gracefully.
SERV_ACC_NO_CALIBRATION	898	Accelerometer not calibrated.
SERV_NOTRECORDING	899	special for IBUS - not recording
SERV_FAIL_HDD_PACKET_WRITE	900	HDD packet write fail.
SERV_FAIL_HDD_PACKET_READ	901	HDD packet read fail.
SERV_FAIL_HDD_SECTOR_WRITE	902	HDD sector write fail.
SERV_FAIL_HDD_SECTOR_READ	903	HDD sector read fail.
SERV_FAIL_SD_READ_WRITE	904	SD card read/write fail.
SERV_FAIL_SD_FAIL	905	SD card failure (replace and format SD card.)
SERV_FAIL_SD_ERROR	906	SD card error (replace SD card.)

SERV_FAIL_H264_CODEC_0	907	H264 Codec (0) Error (rebooting).
SERV_FAIL_H264_CODEC_1	908	H264 Codec (1) Error (rebooting).
SERV_FAIL_LOW_BATTERY	909	Low battery - recorder stopped.
SERV_FAIL_HDD_DIR_FULL	910	HDD full, failure to create file on Hard Disc.
SERV_FAIL_SD_DIR_FULL	911	SD card full, failure to create file SD Card.
SERV_FAIL_IPCAM_IPERR	912	IP Camera address incorrectly configured, doesn't match VLAN2 subnet.
SERV_FAIL_QUOTA_TEST	998	In-house fail quota testing.

8. Software

8.1   X300 Software and Updates

Timespace DVRs use proprietary embedded software in the form of **.XOS** files. Software updates for Timespace DVRs and PCLink Suite are available through authorised distributors or by contacting Timespace support; support@tspace.co.uk. From PCLink V7.2 onwards, updates can be automatically downloaded within PCLink.

Software can be uploaded to the recorder by copying an XOS file onto the removable cartridge using the PC/USB interface, then inserting the cartridge into the recorder and navigating to the relevant menu (see below). An example of the .XOS file name is **X300 V1.1.0.xos**

8.1.1   Software Upload

1. Using the USB interface kit, copy the .XOS file from the PC to the cartridge, ensuring that no other XOS files exist on the disk.
2. Insert the cartridge into the X300 and turn the key lock to the locked position.
3. Once the X300 has initialised, use the Reviewer to navigate to the SETTINGS MENU > ADVANCED > and select LOAD SOFTWARE / SETTINGS > LOAD SYSTEM SOFTWARE.
4. There are then three options to choose from;
    *   LOAD WITH FACTORY SETTINGS (all menu settings will be reset to default values).
    *   LOAD WITH CURRENT SETTINGS (menu settings will be maintained where possible).
    *   LOAD WITH XOS SETTINGS (menu settings will be loaded from the cartridge).

In all LOAD instances, the XOS will be loaded from the cartridge into the X300 internal flash memory. The "WITH XOS SETTINGS" option will also load the *Settings* from the cartridge e.g. if replicating settings from another X300. The load will take approximately 30 seconds and when the X300 reboots, the current software version is displayed on screen. It can also be checked in the SETTINGS MENU > SYSTEM SETTINGS > SYSTEM INFO menu.

WARNING – X300 MAY BECOME UNUSABLE IF POWER TO THE UNIT IS LOST DURING A SOFTWARE UPGRADE.

Software can be downloaded from the recorder to the cartridge. This feature can be used to replicate settings from one recorder to another when setting up multiple units.

8.1.2   Software Download

With the cartridge locked in place in the X300, go to the SETTINGS MENU > ADVANCED and select the SAVE SOFTWARE / SETTINGS option.

This will save the current X300 Software and Settings to the **current.xos** file on the cartridge. The cartridge could then be used in another X300 to load the Software and Settings (using the above

LOAD WITH XOS SETTINGS option). Also, the current.xos file could be copied from the cartridge onto a PC using the USB kit and kept as a master settings file.

8.1.3   Loading software from PCLink

PCLink Suite V7.2 onwards includes a software download feature for acquiring the current and future software release for PCLink Suite and Timespace Digital Video recorders.

From the **Help** menu within PCLink, select **Updates** and choose from the following;
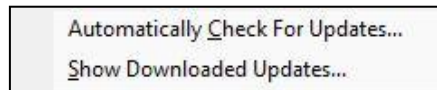
Check for Latest Unit Updates...   PCLink will connect to the internet and check for updates for PCLink, X200, X300and X300. If this is the being run for the first time, updates will be found and downloaded. If on subsequent checks no new versions are available, the download will be skipped. Some basic user information will be collected and the option to be included in future software and product notifications.
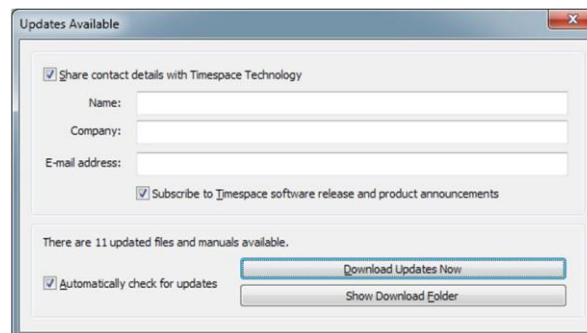
Show Downloaded Updates...   PCLink will open the local folder that the updates were downloaded to.
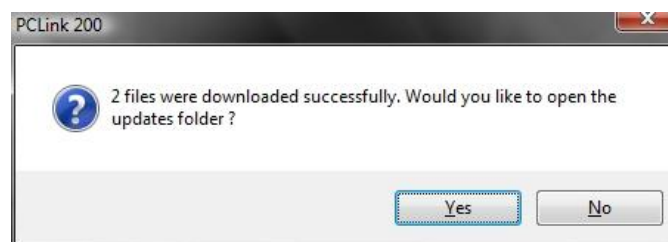
If updates are available for Timespace DVRs, the downloaded **.xos** files will be stored in the DVR sub folder e.g. *Update\X200\X200 V1.9.0.xos*

If a PCLink Suite update is available it will be downloaded as a .zip file using the PCs Internet browser, giving the user the opportunity to **save** the file to their preferred folder. Once complete, the file <u>must</u> be unzipped to a temporary folder and **TSSplash.exe** run (double clicked). This will initiate the PCLink installer.
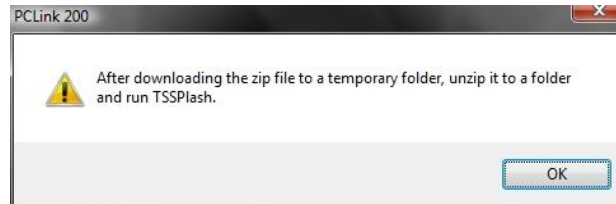
8.2 PCLink Suite
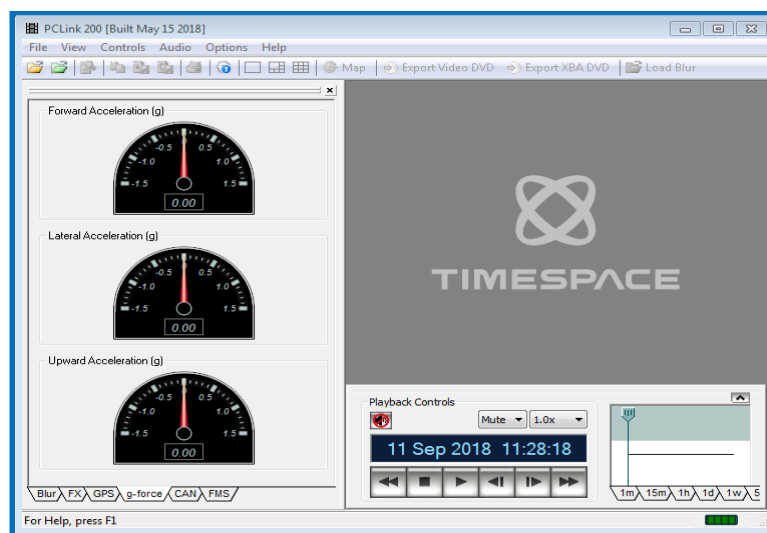
Timespace PCLink Suite consists of applications that allow Playback, Live View, Configuration and Download of recorded files from the X, K and V series range of digital video recorders.

Detailed instructions of each application within PCLink Suite can be found in the PCLink Suite manual, available on our website www.tspace.co.uk

Application overview;

PCLink200   - Review recorded footage via USB cable connected to removable cartridge.
                    - Review recorded footage over IP connection to the X300/other Timespace DVR
                    - Live view of cameras (multi channel support).
                    - Remote configuration of X300/X300 menu settings.
                    - Download file remotely (separate FTP client can also be used to download files).

RemoteLink   - Review recorded footage over GSM / IP connection to the X300.
                - Live view of cameras (single channel support).
                - Remote configuration of X300 menu settings.

LANLink   - Automatic Health checking over IP connection.
                - Automatic and scheduled downloading of footage.

XCommunicate - Download X200 files remotely (single file download support).

Final page of main manual

9. Appendices

APPENDIX 1 – X300 specification and technical data

X300 Mark 2 (4-channel)

Timespace X300
DRIVING SECURITY

Stand alone recorder

Live view using Reviewer or video out to monitor

Review recordings directly from a removable cartridge

Multi-channel live view and wireless download of recordings

Performance

Standard	X300-04 PAL	NTSC
Video recording global rate (IPS)	200	240
Frame rates Min – Max selectable by camera (IPS)	0.1 – 25	0.1 – 30
D1 Resolution (IPS)	50	50
D1 Frame Resolution (pixels)	720 x 576	720 x 480
2CIF Frame Resolution (pixels)	720 x 288	720 x 240
Resolution settings	6	
Video inputs	4	
Audio inputs	2	
Video Output – Configurable	1 – Video switcher / Multi-view	
Video Streaming Live view (IPS)	25	
Hard Disk Cartridge option	500GB, 1TB, 2TB	
Solid state disk	120GB, 240GB, 1TB	

General Features
- Single button start / stop recording or auto record on power-up
- Recorder status indicators (6 LEDs)
- Simultaneous record, playback, live view and file download
- MPEG based format, full image update
- Removable hard disk media cartridge – lockable
- Simple, intuitive menu system with help screens
- Optional embedded GPS position & speed
- Normal, continuous, alarm and motion triggered recording
- 7 day programmable timer recording
- Local playback using Reviewer
- Local set-up and configuration using Reviewer
- Image search by time / date or file name
- Remote set-up and download via LAN, WiFi or mobile network
- Quick review alarm event footage markers
- PC live view, review, download & storage
- Remote control via RS232 interface

Security Features
- Proprietary video file format XBA
- User and Admin password protected functions
- Each image watermarked (SHA-2 AES Authentication – 256 bit)
- Embedded camera number, date and time in each image
- 12 user programmable embedded characters per channel

Optional Features
- 25 IPS global SD memory backup – SDHC 4GB up to 32GB
- File download via SD card
- CANLink data recording (view in sequence with recorded footage)

Connections / Interfacing

	X300-04
Camera	4 – BNC plug
Video out	1 – BNC plug
Audio in	2 – DIN 8 way connector
Audio out	2 – DIN 8 way connector
Timespace Reviewer	RJ45
LAN / WLAN	RJ45
GSM / GPS / RS232	9-way D-Type connector
Alarm inputs	4 – Screw terminal plug
Power down	1 – DIN 8 way connector
Alarm / LED output – Configurable	3 – Screw terminal plug
Power input	2.5 mm DC socket or screw terminal

Physical Characteristics

Enclosure	Extruded Aluminium, with end caps
Dimensions (mm)	212 x 120 x 52
IP rating	IP50
Operating temperature range (°C)	0 – 50
Humidity (% r.h., non condensing)	10 – 90
Mounting options	Free-standing or screw-mounted
Power supply (V DC)	12
Continuous power – without Reviewer (W)	10.0 (0.85 amps)
Reviewer continuous power (W)	3.0 (0.25 amps)
Maximum current – start-up (A)	2.0
Power up time to recording (seconds)	<12
Weight – with removable cartridge (g)	890

Regulatory Approvals
CE Mark (EN55032:2012, EN 55024:2010)
E Mark
95 / 54 / EC Commercial Vehicles
NPIA Specification 5 Issue 10
ISO 9001:2015
RoHS
WEEE

Timespace Technology Ltd reserves the right to amend product specifications without notice and without incurring obligation.

TIMESPACE

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TT0706 Issue 5

X300-16M (16-channel)

Timespace X300-16M
DRIVING SECURITY

Stand alone recorder

Live view using Reviewer or video out to monitor

Review recordings directly from a removable cartridge

Multi-channel live view and wireless download of recordings

WiFi bridge/router

CANLink data recording

Performance

Standard	PAL	NTSC
Video recording global rate (IPS)	200	240
Frame rates Min – Max selectable by camera (IPS)	0.1 – 25	0.1 – 30
D1 Resolution (IPS)	50	60
D1 Frame Resolution (pixels)	720 x 576	720 x 480
2CIF Frame Resolution (pixels)	720 x 288	720 x 240
Resolution settings	6	
Video inputs	16	
Audio inputs	1	
Video Output – Configurable	2 – Video switcher / Multi-view	
Video Streaming Live view (IPS)	25	
Hard Disk Cartridge option	500GB, 1TB, 2TB	
Solid state disk	120GB, 240GB, 1TB	

General Features

- Single button start / stop recording or auto record on power-up
- Recorder status indicators (6 LEDs)
- Simultaneous record, playback, live view and file download
- MPEG based format, full image update
- Removable hard disk media cartridge – lockable
- Simple, intuitive menu system with help screens
- Optional embedded GPS position & speed
- Normal, continuous, alarm and motion triggered recording
- 7 day programmable timer recording
- Local playback using Reviewer
- Local set-up and configuration using Reviewer
- Image search by time / date or file name
- Remote set-up and download via LAN, WiFi or mobile network
- Quick review alarm event footage markers
- PC live view, review, download & storage
- Remote control via RS232 interface

Optional Features

- 25 IPS global SD memory backup – SDHC 4GB up to 32GB
- File download via SD card
- CANLink data recording (view in sequence with recorded footage)

Optional Features

- 25 IPS global SD memory backup – SDHC 4GB up to 32GB
- File download via SD card
- CANLink data recording (view in sequence with recorded footage)

Connections / Interfacing

Camera	16 Molex inputs with power
Video out	2 Molex inputs with power
Audio in	1 Molex input mic-level
Audio out	1 Molex output mic-level
Timespace Reviewer	RJ45
LAN / WLAN	RJ45
GSM / GPS / RS232	9-way D-Type connector
Alarm inputs	10 – Screw terminal plug
Power down	Selectable from alarm inputs
Alarm / LED output – Configurable	3 – Screw terminal plug
Power input	2.5 mm DC socket or screw terminal
CAN	2 Molex inputs

Physical Characteristics

Enclosure	Extruded Aluminium, with end caps
Dimensions (mm)	212 x 120 x 52
IP rating	IP50
Operating temperature range (°C)	0 – 50
Humidity (% r.h., non condensing)	10 – 90
Mounting options	Free-standing or screw-mounted
Power supply (V DC)	12
Continuous power – without Reviewer (W)	10.0 (0.85 amps)
Reviewer continuous power (W)	3.0 (0.25 amps)
Maximum current – start-up (A)	2.0
Power up time to recording (seconds)	<12
Weight – with removable cartridge (g)	890

Regulatory Approvals

CE Mark (EN55032:2012, EN 55024:2010)
E Mark – in progress
ISO 9001:2015
RoHS
WEEE

Timespace Technology Ltd reserves the right to amend product specifications without notice and without incurring obligation.

TIMESPACE

Timespace Technology Ltd Lakeview Court Ermine Business Park Huntingdon PE29 6UA UK
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APPENDIX 2 – Certificates of conformity and type approval

EC DECLARATION OF CONFORMITY – X300 MARK 2

EC Declaration of Conformity   (CE)

We   Timespace Technology Ltd

         Lakeview Court
         Ermine Business Park
         Huntingdon
         PE29 6UA
         United Kingdom

declare that the

X300 Mark 2 Digital Video Recorder

Meets the intent of the European Union Directive 2014/30/EU referred to as the Electromagnetic Compatibility (EMC) Directive. The product conforms to the following standards which have been listed in the Official Journal of the European Union.

EMC

Emissions - EN55032:2012

Electromagnetic compatibility of Multimedia equipment – Emission Requirements.

Conducted - EN55024:2010

Information technology equipment – Immunity characteristics – Limits and methods of measurement.

Dr ROBERT HEYLEN
TECHNICAL DIRECTOR

15th September 2015

EC DECLARATION OF CONFORMITY – X300-16M

EC Declaration of Conformity (CE)

We   Timespace Technology Ltd

Lakeview Court
Ermine Business Park
Huntingdon
PE29 6UA
United Kingdom

declare that the

X300-16M Digital Video Recorder

Meets the intent of the European Union Directive 2014/30/EU referred to as the Electromagnetic Compatibility (EMC) Directive. The product conforms to the following standards which have been listed in the Official Journal of the European Union.

EMC

Emissions - EN55032:2012

Electromagnetic compatibility of Multimedia equipment – Emission Requirements.

Conducted - EN55024:2010

Information technology equipment – Immunity characteristics – Limits and methods of measurement.

Dr ROBERT HEYLEN
TECHNICAL DIRECTOR

14th May 2018

E11 APPROVAL – X300 MARK 2

THE UNITED KINGDOM VEHICLE APPROVAL AUTHORITY

COMMUNICATION CONCERNING THE APPROVAL GRANTED [1]/ APPROVAL EXTENDED [1]/
APPROVAL REFUSED [1]/ APPROVAL WITHDRAWN [1]/ PRODUCTION DEFINITIVELY
DISCONTINUED [1] OF A TYPE OF ELECTRICAL/ ELECTRONIC SUB-ASSEMBLY [1] WITH
REGARD TO REGULATION NO. 10.05

(E11)   Approval No: 10R-055917

Extension No: 01

1.   Make (trade name of manufacturer): Timespace Technology

2.   Type and general commercial description(s): X300 Digital Video Recorder

3.   Means of identification of type, if marked on the vehicle/component/ separate technical unit: [1]
        Self-adhesive label containing the part number

3.1.   Location of that marking: Top left of digital video recorder

4.   Category of vehicle: Not applicable

5.   Name and address of manufacturer:
        Timespace Technology Ltd.
        Blackstone Road
        Huntingdon
        Cambridgeshire
        PE29 6TT
        United Kingdom

6.   In the case of components and separate technical units, location and method of affixing of the
        approval mark: Self-adhesive label located top right of digital video recorder

7.   Address(es) of assembly plant(s): See section 5 above

8.   Additional information (where applicable): See appendix

EAR332382

13-Oct-15

E11 10R-055917 Extension 01

9.   Technical Service responsible for carrying out the tests: HORIBA MIRA Ltd.

10.   Date of test report: As before and 02 September 2015

11.   No. of test report: As before and 1209546-001

12.   Any remarks: None

13.   Place: BRISTOL

14.   Date: 13 OCTOBER 2015

15.   Signature: D LAWLOR
                                                        Head of Technical Standards & Legislation

16.   The index to the information package lodged with the Approval Authority, which may be
       obtained on request, is attached.

17.   Reasons for extension: To cover
       1) Updated main PCB layout
       2) Addition of alarm input feature.
       3) Update of approval to ECE R10.05

(1)   Strike out what does not apply.

E11 APPROVAL – X300-16M

Vehicle
Certification
Agency

THE UNITED KINGDOM VEHICLE APPROVAL AUTHORITY

COMMUNICATION CONCERNING THE APPROVAL GRANTED [(1)]/ APPROVAL EXTENDED [(1)]/
APPROVAL REFUSED [(1)]/ APPROVAL WITHDRAWN [(1)]/ PRODUCTION DEFINITIVELY
DISCONTINUED [(1)] OF A TYPE OF ELECTRICAL/ ELECTRONIC SUB-ASSEMBLY [(1)] WITH
REGARD TO REGULATION NO. 10.05

(E11)   Approval No: E11*10R05/01*10573*00

1.   Make (trade name of manufacturer): Timespace Technology Ltd.

2.   Type and general commercial description(s): T616M (X300-16M) Digital Video Recorder (DVR)

3.   Means of identification of type, if marked on the vehicle/component/separate technical unit [(1)]
        Self-adhesive label containing the part number

3.1.   Location of that marking: Located on the top left of the X300-16M DVR

4.   Category of vehicle: Not applicable

5.   Name and address of manufacturer:

        Timespace Technology Ltd.
        Lakeview court
        Ermine Business Park
        Huntingdon
        PE29 6UA
        United Kingdom

6.   In the case of components and separate technical units, location and method of affixing of the
        approval mark: Self-adhesive label located on the top left of the X300-16M DVR

UK
Approval
Authority
Vehicle
Certification
Agency
04-Feb-19

E11*10R05/01*10573*00

7.   Address(es) of assembly plant(s): See item 5

8.   Additional information (where applicable): See appendix

9.   Technical Service responsible for carrying out the tests: HORIBA MIRA Ltd.

10.   Date of test report: 11 January 2019

11.   No. of test report: 1218164#01

12.   Any remarks: Approval to Supplement 1

         See Appendix

13.   Place: BRISTOL

14.   Date: 04 FEBRUARY 2019

15.   Signature:

                                                     D LAWLOR
                                Chief Technical and Statutory Operations Officer

16.   The index to the information package lodged with the Approval Authority, which may be obtained on request, is attached.

17.   Reasons for extension: Not applicable

(1)   Strike out what does not apply.

EAU421176

An executive agency of the Department for Transport
December 2017 Revision 6
Page 2 of 3

UK Approval Authority | Vehicle Certification Agency
04-Feb-19

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E11*10R05/01*10573*00

Appendix

to type-approval communication form No. E11*10R05/01*10573*00

concerning the type-approval of an electrical/electronic sub-assembly under Regulation No. 10.05

1.   Additional information:

1.1.   Electrical system rated voltage: 12 V. ~~pos~~/neg ground [1]

1.2.   This ESA can be used on any vehicle type with the following restrictions:
        See manufacturer's instructions

1.2.1. Installation conditions, if any: See manufacturer's instructions

1.3.   This ESA can be used only on the following vehicle types: Not applicable

1.3.1. Installation conditions, if any: Not applicable

1.4.   The specific test method(s) used and the frequency ranges covered to determine immunity
        were: (Please specify precise method used from Annex 9):
        Not applicable – The ESA was defined as not immunity related

1.5.   Laboratory accredited to ISO 17025 and recognized by the Approval Authority responsible for
        carrying out the tests:

        HORIBA MIRA Ltd.
        Watling Street
        Nuneaton
        Warwickshire
        CV10 0TU
        United Kingdom

2.   Remarks: None

[1]   Strike out what does not apply.

UK Approval Authority | Vehicle Certification Agency
04-Feb-19

APPENDIX 3 – Splash Screen

SPLASH SCREEN – Enables use of a .BMP file to be displayed, for example an Operator/Company logo. Can be set to 5, 10, 20, 30, 60 seconds, or Until Exit (which requires user interaction to clear).

A tool can be provided on request to create the Splash Screen image in the correct format, from an input source. The input source should not be more than 1.5mb and should be a simple image with plain colours, approx 720x576. An example images is show below;
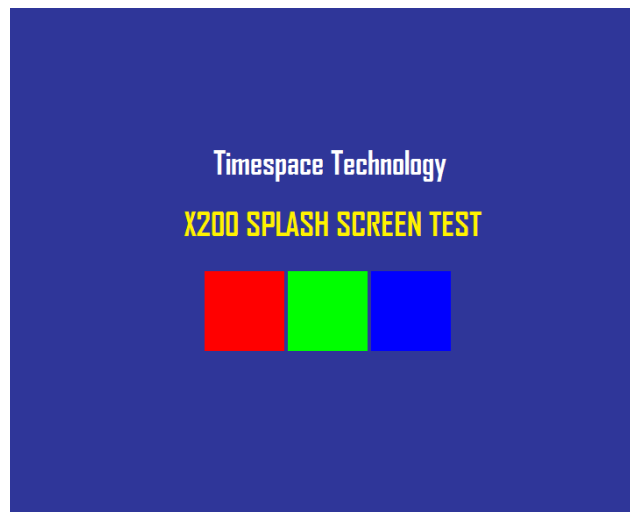
Once in the correct format (using the Timespace conversion tool), the image is placed on the X300 cartridge, named; Splash.ext. Once configured in the menu, the Splash Screen will be read from the disk and displayed.

Please contact support@tspace.co.uk for the conversion tool.

APPENDIX 4 – Tokens / Protocol

The X300 is always looking for tokens to perform actions but no responses are monitored. The remote device should monitor the OK<R> messages that are returned. It is looking for all tokens apart from when writing file data. In this case only the "#ENDFILE<R>" is searched for.

All commands sent to the X300 are acknowledged, for example if the client sends #RECSTART<R>, OK<R> will be returned to the client to signify that the command was successfully carried out. In the case of commands like GETTIME and GETDATE, OK<R> will not be returned, but the data requested, followed by a <R>. In the case of PREVIOUSFILE and NEXTFILE, OK<R> will be replaced with either LAST<R> or FIRST<R> if there are no more files to play next or previous, respectively. When sending commands, the sender to the X300 can wait for an OK before sending another command, or one of the other variants listed above.

There may be a need for a hold off time between certain commands (e.g. 10 mS), as the X300 may take a finite time to do certain tasks. To add delay you could simply put spaces between one command and the next and these are ignored. The X300 does have a FIFO queue of 2048 bytes so can buffer data. Certain commands can be followed immediately with other commands for example:

```
#CAMERA_<1-16><R>#PLAY<R>                          -play a given camera
#SETTIME_<12:23:45><R>#SETDATE_<23/09/10><R>           -set time and date
```

Definitions

_	- A space
<>	- Parameter, don't include brackets
<R>	- return (char 13)
FAIL	- File system failed to create file, aborted
FAIL	- File name is illegal
OK	- Acknowledgement, Command carried out
CLIENT	- The external equipment that is connected to the X300 via RS232 or Telnet
BAUD Rate	- This shall be selectable from within a menu

<TEXT> - Textual data

Writing files
Write File command: **#WRITEFILE,<FILENAME><R>**
Close File command: **#ENDFILE<R>**

A return <R> character at the end of the "#WRITEFILE" command will signify the beginning of the writing process. All data from this point onwards will be written into the file specified. If the file system fails to create the file for any reason, FAIL<R> will be returned to the client.

A check is done on the file name length, if the user overruns (number of characters in total is greater than 60), FAIL<R> will be transmitted to the client, and the write command is aborted. The user should only use uppercase letters and numbers in the filename and the space character. The extension ".EXT" is automatically applied by the X300, for example

Command   Created file
#WRITEFILE,REPORT<R>   REPORT.EXT
#WRITEFILE,TICKET DATA 6 DEC 2010<R>   TICKET DATA 6 DEC 2010.EXT
If the file has been created effectively, OK<R> will be sent to the client. The client may now proceed to send the file data. When the token #ENDFILE<R> is received, the file is closed, and the client will be sent OK<R>. A new file may now be opened if required. In the example below, all the text in BOLD is written to the file "TICKETS.EXT"

#WRITEFILE,TICKETS<R>
DATE: 24/12/2011
TIME: 11:48:00
LOCATION: KINGS CROSS
#ENDFILE<R>

Reading files
Read File command: **#READFILE,<FILENAME><R>**

A return <R> character at the end of the #READFILE<R> command will signify the beginning of the reading process. Data will now be transmitted from the X300 to the client. The handshaking line CTS on port 1 may be used if required to pause the data flow. If the file system fails to open the file for any reason, FAIL<R> will be returned to the client. A check is done on the file name length, if the user overruns, FAIL<R> will be transmitted to the client, and the read command is aborted. If all is good, OK<R> is sent followed by the file data followed the token #ENDFILE<R>. The following example reads the file "TICKETS.EXT".

Sent to X300   Received from X300
#READFILE,TICKETS<R> DATE: 24/12/2011
                                        TIME: 11:48:00
                                        LOCATION: KINGS CROSS
                                        #ENDFILE<R>

Recording

If for any reason recording stops, even if instructed to, the X300 will return #RECSTOP<R>

#DISKREMOVED<R> will be sent under two conditions.

1) The disk is removed from the X300 at anytime post X300 initialization.
2) Live view always has been enabled and the X300 boots without a disk.

#DISKIN<R> will be sent under two conditions.

1) The disk is inserted into the X300 at anytime post X300 initialization.
2) Live view always has been enabled and the X300 boots with a disk.

Control Commands

#RECSTART<R>	- start recording
#RECSTOP<R>	- stop recording
#STOP<R>	- stop playback
#PLAY<R>	- start playback (standard)
#REPLAY<R>	- play backwards (standard)
#WIND<R>	- fast forwards (standard)
#REWIND<R>	- rewind (standard)
#XPLAY_<FACTOR><R>	- plays at the specified factor speed (-/+)
#CAMERA_<1-16><R>	- camera to control
#LIVEVIEW<R>	- switch to live view
#AUTOLIVEVIEW<R>	- switch to live view automatic mode
#JOGFORWARD<R>	- one frame backwards
#JOGBACKWARD<R>	- one frame forwards
#GOTONEWESET<R>	- go to the newest recording
#GOTOOLDEST<R>	- go to the oldest recording
#GOTO_<HH:MM- DD/MM/YY><R>	- go to time DD:MM:YY_HH:MM
#GOTO_<HH:MM:SS-DD/MM/YY><R>	- go to time DD:MM:YY_HH:MM:SS
#SETTIME_<HH:MM:SS><R>	- sets the time
#SETDATE_<DD/MM/YY><R>	- sets the date
#GETTIME<R>	- gets the time
#GETDATE<R>	- gets the date
#NEXTFILE<R>	- when playing, skips to the beginning of the next file
#PREVIOUSFILE<R>	- when playing, starts at the beginning of the currently playing file. When stopped and #PREVIOUSFILE is issued twice, followed by a play, the previous file will begin playing from the beginning.
#GETFILETIMEDATE file.	- gets the current playing position of the currently play
#GETSTATS	- returns statistics
#DELETEALLREC	- removes all recording files from disk
#ALARMOUT<1-4>_0/1	- Turns ALARMOUT LED Output ON (1) or OFF (0)
#ALARMOUT<1-4><R>	- Returns the status of ALARMOUT, 0 or 1
#ALARMIN<1-10><R>	- Returns the status of ALARMIN, 0 or 1
#ALARMIN<1-10>1_0/1	- sets the state of the Digital input 1 ON(1) or OFF(0)
#CAMTEXT_<1-16>_<TEXT><R>	- writes text to the console at record time, Char 255 moves to the beginning of a new line. Maximum 49 characters per camera.
#DISKSTATUS	- returns #DISKREMOVED or #DISKIN
#MODESTATUS	- Returns #RECORD, #PLAY or #IDLE
#SETCAMTEXT_<1-16>_<TEXT><R>	- sets the camera text. This is fixed to 12 characters per camera.
#SETFILETEXT_<TEXT><R>	- sets the filename text. Max 12 characters.
#LOGRESET<R>	- resets the service log
#LOGREAD<R>	- reads the service log and returns up to the 10 latest entries

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#MULTIVON<R>   - Turns Multiview On
#MULTIVOFF<R>   - Turns Multiview Off
#LOG_<TEXT><R>   - Logs a text message to the X300's service log (does
                                               not light service LED). Sending RESET LOG as the text
                                               marks off the LANLink should read the messages up
                                               to. OK<R> is returned if the daily quota of 10 has not
                                               been reached, other wise 10/DAY<R> is returned

Commands in Detail

#GETFILETIMEDATE
Gets the current playing position of the currently playing file. Please use #MODESTATUS to tell
if the time you are reading is live play or if in idle mode, as the time you receive will ways be
the current/last position played.

#GETSTATS
Will return the following stats in the same format. #END<R> signifies end of file. The stats may
possibly grow in the future, but will be append to this list. Scanning for #END after the data has
been retrieved. Data may be scanned for by capturing just after the colon (:) and just before
the end of line <R>

        Capacity: 500.11GB
        Used: 0.38 %
        Write Protected: 0.00 %
        First File: 16:09:00 - 21/12/10
        Last File: 16:50:00 - 21/12/10
        Days Recording: 0.03
        Model Number: Hitachi HTS545050B9A
        Serial Number: 100924PBN400B7F2LW7L
        #END

#DELETEALLREC
The #DELETEALLREC command will stop the current recording and delete all recording files.
When complete, OK<R> will be returned
#LED1, #LED2, #ALARMOUT

The following 3 commands control the 2 digital outputs and the Alarm output. These settings
will be OK'd with the current hardware states of the X300.

#ALARMOUT1_0/1<R> – Sets the active state for the alarm output CLOSE/OPEN.
..
#ALARMOUT10_0/1<R>
#ALARMOUT<R> - Returns the status of the ALARMOUT port, 0 = off, 1 = on

#ALARMIN1 - #ALARMIN10
Each one of the alarm inputs can be virtually activated by using the following commands, which control each alarm input independently. These settings will be OK'd the current hardware states of the X300.

#ALARMIN1_0/1<R>
..
#ALARMIN10_0/1<R>

By using these commands, a camera may be assigned to each alarm input, thereby allowing recording on each channel to be selective and/or allow for a different set of recording rates between Normal and Alarm recording

The following commands will READ the status of the ALARMIN pots:

#ALARMIN1<R> - Returns the status of the ALARMIN1, 0 = off, 1 = on
..
#ALARMIN10<R> - Returns the status of the ALARMIN10, 0 = off, 1 = on

#CAMTEXT

#CAMTEXT_1_HELLO WORLD<R>   - "Hello world" will be written at the top left
hand corner
#CAMTEXT_3_<255><255><255>HELLO<R>   - "Hello" will be written on the 4 line on
camera 3

If text has been assigned to a camera, simply issuing blank text will clear all RS232 overlay text from that camera. A maximum of 49 characters may be sent to the screen including new line control codes. e.g. #CAMTEXT_3_<R> will clear the text (please note the space after 3)

#SETCAMTEXT_<1-16>_<TEXT><R>
Sets the camera text as via the CAMERA OPTIONS menu on the X300.   Numbers 1-16 are the camera selection followed by the actual text. This is fixed to 12 characters per camera.

#SETFILETEXT_<TEXT><R>
Sets the filename text for the X300 file system to use. Max 12 characters.

#LOGRESET<R>   Resets the service log

#LOGREAD<R>   Reads the service log and returns up to the 10 latest entries

Examples

CAMERA_1<R>	switch to camera 1 (either in live/auto view or during playback)
XPLAY_0.5<R>	plays forward at half speed
XPLAY_-3.2<R>	plays in reverse at 3.2 times real time rate
XPLAY_10<R>	plays forwards at 10x speed
SETTIME_12:23:23<R>	sets the time in the format HH:MM:SS
SETDATE_23/09/05<R>	sets the date in the format DD:MM:YY
#GETTIME<R>	to which 12:23:23<R> is returned
#GETDATE<R>	to which 23/09/05<R> is returned
#LED1_1<R>	turn LED1 on
#CAMTEXT_1_Hello><R>	writes "Hello" to the console at record time in the top left corner.

A windows demonstration tool is available with source code upon request by emailing
support@tspace.co.uk

APPENDIX 5 – Health SMS Format

If a parameter is not known or not to be included (i.e. set to NO on the menu), then the char '–'
is used in the message. Three examples are shown below;

1,076812,BUS AO52 WXA,-,-,L,CNCC,064253 280509,120510 240509,S,212756120509,S,17,MODEM SEND ERROR

1,076812,BUS AO52 WXA,HUNTINGDON12,-,L,CNCC,064518 280509,120510 240509,-,064353 280509,S,63,LOG RESET

1,076812,BUS AO52 WXA,HUNTINGDON12,-,L,CNCC,064518 280509,120510 240509,-,-,-,-,-

FIELD	DESCRIPTION	VALUE
<1. type>	Reason health SMS has been sent	"0" - SMS POWER-UP. "1" - SMS SEND DAILY. "2" - SMS SEND NOW. "3" - SMS SEND NOW via incoming SMS.
<2.serial_num>	Unit serial number.	"Serial num" - The X300 6-digit serial number.
<3.veh_id>	Optional camera 1 text.	"Camera1 text" - Camera1 text, up to 12 chars. "NO ID" - No camera 1 text specified.
<4.veh_id1>	Optional filename text.	"Filename text" - Filename text, up to 12 chars. "NO ID1" - No camera 1 text specified.
<5.gps_pos>	Current or last GPS position.	"ddmmm.mmmmX dddmm.mmmmX" - GPS position "NO GPS DATA" - No GPS data available.
<6.last_curr>	Indication that GPS position is last known or current GPS position.	"C" - GPS posn specified in 5 is the current position. "L" - GPS posn specified in 5 is the last know position i.e. NOT current.
<7.cams_conn>	List of cameras connected.	"C" - Colour camera is connected. "B" - Black and white camera is connected. "N" - Camera is NOT connected (i.e. disconnected).
<8.curr_ts>	Snapshot of current timestamp.	"Current timestamp" - Timestamp.
<9.last_rec_file_ts>	Timestamp of last recorded file.	"Last file timestamp" - Timestamp. "NO RECORDINGS" - There are no recordings on disk.
<10.led_status>	Service/Fail/Record LED status.	"R" - Record LED is ON. "S" - Service LED is ON.
<11.log_ts>	Timestamp of the last log entry.	"Log timestamp" - timestamp. "" - May be blank if no log.
<12.log_mode>	Log entry mode.	"Mode text" - Mode text. "NO MODE" - No mode text available. "" - May be blank if no log.
<13.log_code>	Log entry code.	"Code text" - Mode text. "NO CODE" - No code text available. "" - May be blank if no log.
<14.log_desc>	Log entry description.	"Desc text" - description text. "NO LOG" - No logs available.

DETAILED DESCRIPTIONS

A description of the expected content for each heading in the message follows:

<1. type>
   Description: The type of message or the reason the message has been sent (the fleet mgmt may wish to know if it is the daily message or one they have just requested).
   Content:
"0" – SMS POWER-UP
"1" – SMS SEND DAILY
"2" – SMS SEND NOW
"3" – SMS SEND NOW (via incoming SMS).

<2.serial_num>
   Description: The serial number of the X300 unit.
   Content:
Serial num – The X300 6-digit serial number.
'–'   – Not known or not available.

<3.veh_id>
   Description: Camera 1 optional text (OTHER>CAMERA OPTIONS).
        This is selected for inclusion in the message via the Health over SMS hidden menu.
   Content:
Camera1 text – Camera1 text, up to 12 chars.
'–'   – No optional camera 1 text specified or not included in the menu.

<4.veh_id1>
   Description: Filename optional text (OTHER>FILE SYSTEM).
This is selected for inclusion in the message via the Health over SMS hidden menu.
Content:
Filename text – Filename text, up to 12 chars.
'–'   – No optional filename text specified or not included in the menu.

<5.gps_pos>
   Description: The current or last known GPS posn (specified as longitude then latitude in degrees and minutes).
Content:
"ddmmm.mmmmX dddmm.mmmmX" – GPS posn
'– '   – No GPS data available.

<6.last_curr>
   Description: An indication if the GPS posn is the current posn or last known.
   Content:
"C" – GPS posn specified in 5 is the current posn.

"L"   – GPS posn specified in 5 is the last know posn (i.e. NOT current).

<7.cams_conn>
          Description: Camera status.
          Content:
"C" – Colour camera is connected.
"B" – Black and white camera is connected.
"N" – Camera is NOT connected (i.e. disconnected)

Cameras are listed as 1234 etc, e.g. CCBN is a 4 camera system, where cam1,2=colour,
cam3=B&W, cam4 disconnected.
Camera systems are either 4 or 16.

<8.curr_ts>
          Description: Current X300 system timestamp.
Format is "hhmmss ddmmyy" or "hhmmss mmddyy" depending on menu setting
(OTHER>TIME AND DATE mode option).
Note that there are no separator characters in the time and date strings due to message size
limitations.
          Content:
Current timestamp   - Timestamp.

<9.last_rec_file_ts>
          Description: The timestamp of the last recorded file (i.e. newest file).
Format is "hhmmss ddmmyy" or "hhmmss mmddyy" depending on menu setting
(OTHER>TIME AND DATE mode option).
Note that there are no separator characters in the time and date strings due to message size
limitations.
          Content:
Last file timestamp   - Timestamp.
'–'   - There are no recordings on disk.

<10.led_status>
          Description: X300 front panel LED status.
          Contents:
"R"   - Record LED is ON.
"S"   - Service LED is ON.
"F"   - Fail LED is ON.
'–'   - No LEDs are on (with exception of the power LED).

The information under the remaining headings pertains to the last service or fail log (newest
log).
If the Service and/or Fail LED are reported as ON under the previous heading, then the last
service or fail log information is included in the message.

If no service or fail logs are available (e.g. if a service log reset has been performed), then no log information will be available.

<11.log_ts>
            Description: The timestamp of the last service log.
Format is "hhmmss ddmmyy" or "hhmmss mmddyy" depending on menu setting (OTHER>TIME AND DATE mode option).
Note that there are no separator characters in the time and date strings due to message size limitations.
            Contents:
Log timestamp – timestamp
"–"   – May be blank if no log.

<12.log_mode>
            Description: Service log mode, e.g. Service, Failure.
Contents:
Mode text   – Mode text.
 "–"   – No mode available or no log available.

<13.log_code>
            Description: Service log code relating to mode.
            Contents:
Code text   – Mode text.
 "–"   – No code available or no log available

<14.log_desc>
            Description: Reason for service log.
                                 Note: Due to message length constraints, this information may be partial or missing.
Desc text   – Log description text.

<div align="center">Final page of Appendices</div>