

TVR 41 A&E Specifications

A. Digital Video Recorder

1. The Digital Video Recorder with Ethernet connectivity shall be as manufactured by Interlogix or an approved equal. The TVR 41 shall require minimal training for the end user. The unit shall be operated like a conventional multiplexer and VCR with local display monitors for live and playback viewing while the system continues to record new images. It shall be an integrated security system, capable of time division multiplexing and real time recording multiple cameras, and storing their digitized and compressed images on integral hard disk drives for fast search and retrieval either locally at the unit, or from a remote workstation using a Graphical User Interface (GUI).
2. Additionally, the system shall provide automated alarm handling. Upon receipt of an alarm, the system shall be able to automatically change display and record speed, provide relay output operation, and provide serial data transfer to a host. The system shall be able to determine alarm change of state (COS) conditions from integral motion detection, hard-wired alarm inputs, or serial data transfer from a host. It shall similarly be able to sense an event COS by receipt of text data from a foreign host through a serial port on the unit. During investigations, it shall be possible to search and retrieve stored video data by date, time, camera, alarm, and transaction text.
3. The TVR 41 shall include, but not be limited to the following:
 - a. The TVR 41 shall function as a standalone unit. It shall not require the use of a personal computer, special monitors, or other peripheral devices for either programming or operation. Live and recorded playback of video images shall display on conventional CCTV monitors or LCD monitor.
 - b. The TVR 41 shall be capable of displaying onscreen text and menus in more than one language. This shall be user selectable via the menu system.
 - c. The TVR 41 shall have robust buttons integrated into the front panel of the unit, used for menu navigation, setup, and control of the unit, with no need for an external control device.
 - d. The TVR 41 shall have robust and illuminated buttons integrated into the front panel of the unit for each camera, display, sequence, monitor A, monitor B, live, playback, pause, alarm, and a multi function trigger-point-joystick navigation.
 - i) Camera buttons shall show the camera status, green for fully operational, red in case of Video Loss or occurring Alarm.
 - ii) An alarm button shall be lit if an alarm occurs.
 - iii) An alarm indication bar shall visualize an alarm, additionally the causing criterion shall be shown by alarm indication lights for
 - a) HDD
 - b) Network
 - c) Internal
 - d) Alarm

- iv) Alarms shall be acknowledgeable by an alarm button, but shall be raised again after a certain time if the root cause has not been fixed.
- e. The front panel shall have an illuminated trigger point joystick; associated illumination shall be lit based on the available functions.
- f. The comprehensive search function shall be activated by using the search button,
- g. The TVR 41 shall support one button quick archive, auto detecting the storage media inserted and the maximal storage capacity.
- h. The TVR 41 shall have a built in slim-line slot-drive CD/DVD burner, the optical media shall be ejected by pressing the eject button.
- i. TVR 41 shall have a USB port at the front panel supporting a mouse or memory sticks for archiving video and audio files for evidence.
- j. TVR 41 shall provide external keyboard support and all DVR and PTZ control functions shall be supported.
- k. The TVR 41 shall use an easy-to-read, onscreen menu system of icons and pop-up selections.
- l. The TVR 41 shall use a battery to back up memory that stores the time, date, and all internal programming functions.
- m. The TVR 41 shall have log view screens to show the entire system status at a glance.
- n. The TVR 41 shall support Auto Install to do the following:
 - i) Automatically detect loss of video sync, with onscreen indicators. If video loss is detected during recording the TVR 41 will warn by onscreen, send message to remote, buzzer will sound and a relay will be switched.
 - ii) Automatically control gain per camera, which shall be adjustable by the user
- o. The TVR 41 shall prevent unauthorized program tampering through the use of at least sixteen users and passwords, with settings including:
 - i) Local user priveleges
 - ii) Remote user priveleges
 - iii) Local play priveleges
 - iv) Remote play priveleges
 - v) Remote view priveleges
- p. The TVR 41 shall be two units of rack space in height (2U) and capable of being rack mounted (EIA 19-inch standard), with rack mount hardware that was designed by the manufacturer to support the units.
- q. The TVR 41 shall be provided with a build in power supply to prevent susceptibility to power spikes, surges, harmonics, and other common electrical disturbance phenomena associated with the installation environment.
- r. The TVR 41 shall support Digital Zoom in a user defined area.
- s. eSATA port shall be configurable either as a Storage Expansion Port or for external video archiving on eSATA media
- t. The video player shall be zero footprint player and exported with the video as evidence player
- u. A Windows Media Player filter shall be available in order to allow the playback of evidence video using default Windows Player
- v. TVR 41 shall support an easy to use Internet Explorer based Web Browser. The supported features shall be:
 - i) Camera live view with up to 16 cameras simultaneously

- a) Capability to switch between Main stream and Substream per camera individual and all cameras at once
 - ii) PTZ functionality with Preset call up
 - iii) Playback of recorded video
 - iv) Archiving of recorded video
 - v) Comprehensive remote configuration

- 4. The digital recorder shall have the following operational features:
 - a. Recording
 - i) The TVR 41 shall record video on a hard disk drive. No videotape or videotape recorders shall be required.
 - a) The TVR 41 shall support both internal and external hard disk configurations.
 - b) Internal storage configurations shall be 1TB, 2TB, 4TB, 8TB and 12TB
 - c) The utilized Hard Drives shall support latest SATA technology including SMART reporting
 - ii) The utilized Hard Drives shall be especially developed for the Digital Video Archiving Industry
 - iii) The TVR 41 shall support user programmable stored video frame rates that can be programmed on a per-camera basis. All cameras shall be programmable to capture images in one of the following operating modes:
 - a) Constant
 - b) Manual
 - c) Motion
 - d) Event
 - e) Schedule
 - f) TimeLapse
 - iv) At a minimum, the TVR 41 shall support the following stored video frame rates per camera:
 - a) real-time (NTSC/PAL)
 - b) 20 fps
 - c) 16 fps
 - d) 12 fps
 - e) 8 fps
 - f) 4 fps
 - g) 2 fps
 - h) 1 fps
 - i) 1/16 fps
 - v) The TVR 41 shall support an alarm record mode that is user programmable. At a minimum, the TVR 41 shall support the following alarm mode stored video frame rates:
 - a) real-time (NTSC/PAL)
 - b) 20 fps
 - c) 16 fps

- d) 12 fps
- e) 8 fps
- f) 4 fps
- g) 2 fps
- h) 1 fps
- i) 1/16 fps
- vi) The TVR 41 shall allow the user to select whether the hard disk recording should automatically overwrite data (starting with the oldest data first) or if the user must confirm overwriting before recording will continue when the hard disk is filled.
- vii) The TVR 41 shall have image quality settings that are adjustable on a per camera basis by the end user, including the following:
 - a) 4CIF
Streaming bandwidth: 2Mb, 1.75Mb, 1.5Mb, 1.25Mb, 1Mb, 896Kb, 768Kb, 640Kb, 512Kb, 448Kb, 384Kb, 320Kb, 256Kb, 224Kb, 192Kb, 160Kb, 128Kb, 96Kb, 80Kb, 64Kb and by User
 - b) 2CIF
Streaming bandwidth: 2Mb, 1.75Mb, 1.5Mb, 1.25Mb, 1Mb, 896Kb, 768Kb, 640Kb, 512Kb, 448Kb, 384Kb, 320Kb, 256Kb, 224Kb, 192Kb, 160Kb, 128Kb, 96Kb, 80Kb, 64Kb and by User
 - c) CIF
Streaming bandwidth: 2Mb, 1.75Mb, 1.5Mb, 1.25Mb, 1Mb, 896Kb, 768Kb, 640Kb, 512Kb, 448Kb, 384Kb, 320Kb, 256Kb, 224Kb, 192Kb, 160Kb, 128Kb, 96Kb, 80Kb, 64Kb, and by User
 - d) QCIF
Streaming bandwidth: 2Mb, 1.75Mb, 1.5Mb, 1.25Mb, 1Mb, 896Kb, 768Kb, 640Kb, 512Kb, 448Kb, 384Kb, 320Kb, 256Kb, 224Kb, 192Kb, 160Kb, 128Kb, 96Kb, 80Kb, 64Kb and by User
- viii) The TVR 41 shall support from one to thirty seconds of pre alarm recording, maintained in a buffer, and shall append this buffer to the beginning of all recorded alarms. Buffer size shall be user programmable. The TVR 41 shall continue to record at the alarm rate until the alarm is reset, times out, or is acknowledged as determined by the alarm menu programming.
- ix) The TVR 41 shall support from one to thirty seconds of pre-event recording, maintained in a buffer, and shall be append this buffer to the beginning of all recorded events. Buffer size shall be user programmable. The TVR 41 shall continue to record at the event rate until the programmed event duration (from 5 seconds to 10 minutes) expires.
- x) The TVR 41 shall allow the user to manually or automatically customize the record rates per camera for events and motion detection.
- xi) The user shall be able to play back images smoothly at normal or fast speeds and in forward modes, without distortion.
- xii) The unit shall provide full media search capabilities for archiving, restoring, and playback operations. Search capabilities shall include filters for start/stop times, start/stop dates, alarm and event occurrences, inserted text, and camera number.
- xiii) The unit shall use H.264 technology to compress and store pictures prior to recording.
- xiv) The TVR 41 shall support the recording of all images with a digital watermark. The verification of watermarked images shall reside solely with the manufacturer.
- b. Dual Streaming and V-stream
 - i) The TVR 41 shall allow the installer to setup a Substream for streaming Video and Audio over Network without affecting the record rate, quality and resolution of recorded video.

- ii) The TVR41 shall allow the installer to setup a V-stream that allows the Web browser or remote client to view several channels (up to 16) in one stream thereby saving network bandwidth,
- c. Archiving
- i) The TVR 41 shall support archiving of recorded images through USB USB memory stick.
 - ii) The TVR 41 shall support archiving of recorded images through eSATA to an external eSATA-HDD.
 - iii) The TVR 41 shall support archiving of recorded video and audio data through built-in slim-line slot-drive optical drive.
 - iv) The TVR 41 shall support archiving of recorded video and audio data through eSATA to an external eSATA -HDD
 - v) Backup the Day shall be supported, user can select which day of video recordings shall be archived to an external media.
 - vi) The TVR 41 shall have an option to select the type of archiving device connected, when interfaced to the devices specified or approved equals.
 - vii) The TVR 41 shall support selective archiving.
 - viii) The TVR 41 shall have an on-screen progress indicator when selective archiving or restoration operations are accessing the archive device.
 - ix) The TVR 41 shall support schedule archiving which means the archiving can follow a schedule and happen automatically.
 - x) The TVR 41 shall have an Automatic Delete Mode (ADM) that may be enabled or disabled, preventing any video that is older than a user-defined period from being viewed or archived, when the unit is used in jurisdictions that mandate a finite storage time. Automatic Delete Mode shall be programmable from 0 to 60 days.
- d. Multiscreen
- i) The TVR 41 shall be a triplex type unit, allowing simultaneous recording, playback, and live Multiscreen viewing at the unit, with no need for additional hardware.
 - ii) The TVR 41 shall provide the following displays in live mode: full screen, sequencing, 4-way, 6-way, 8-way, 9-way, or 16-way.
 - iii) The TVR 41 shall provide the following Triplex displays in playback mode: full screen, 2-way, 4-way, 9-way, or 16-way and switching between cameras.
 - iv) The TVR 41 shall allow the user to rearrange cameras in any Multiscreen display in live mode.
 - v) The TVR 41 shall incorporate the following display options:
 - a) Camera titling with a minimum of up to 16 alphanumeric characters
 - b) Title display enable/disable, per channel
 - c) Time/date formatting
 - d) Time/date enable/disable, per channel
 - vi) The TVR 41 shall provide image update rates for live and record modes of up to 30fps for NTSC or up to 25 fps for PAL per channel
 - a) The TVR 41 shall have three monitor outputs as follows:
 - 1) One analog Multiscreen monitor-A output
 - A) Composite video, BNC connector
 - B) NTSC/EIA or PAL/CCIR compatible

- C) Shall display live, playback, and programming functions
 - 2) One digital Multiscreen monitor-B output
 - A) HDMI connector
 - B) Shall be able to display all cameras live or in sequence mode
 - 3) One analog Multiscreen monitor-C output
 - A) VGA connector
 - B) Shall display live, playback, and programming functions
- e. Video motion detection
 - i) The TVR 41 shall support the following video motion detection, with onscreen indications when motion is occurring:
 - a) Motion detection, which shall be treated as an alarm.
 - b) The TVR 41 shall support an onscreen setup scale to determine the optimum sensitivity setting for each camera input.
 - c) The TVR 41 shall have 396 zones per camera, arranged in a 22 by 18 grid.
 - d) The TVR 41 shall have 7 levels of sensitivity.
 - e) The TVR 41 shall have 255 levels for size discrimination.
- f. Masking / Privacy Zones
 - i) The TVR 41 shall support the following video masking
 - a) The TVR 41 shall have 396 zones per camera, arranged in a 22 by 18 grid.
 - b) The TVR 41 shall have be able to have 4 mask areas per camera
- g. Tampering
 - i) The TVR 41 shall support the following video tampering
 - a) The TVR 41 shall have 3 levels of sensitivity.
 - b) The TVR 41 shall have 396 zones per camera, arranged in a 22 by 18 grid.
- h. Alarms
 - i) The TVR 41 shall support up to 16 alarm inputs (one per camera), programmable as normally open or normally closed from within the menus.
 - ii) The TVR 41 shall support four form-C relays as alarm outputs, each programmable as normally open or normally closed from within the menus, and rated for 0.5 A continuous, 1.0 A momentary. Upon alarm, the system shall be able to execute a change of state (COS) to relay number 1, relay number 2, relay number 3, relay number 4 or all.
 - iii) The TVR 41 shall have a fully programmable additional audible device to alert the user to alarms, motion detection, and video loss occurrences or operation failure.
 - iv) The TVR 41 shall support alarm latching with two settings, which shall be manually set or programmable from the menus as follows:
 - a) Manual acknowledge - When an alarm is activated, the TVR41 shall be manually acknowledged to reset the COS back to normal condition.
 - b) Timed out – the alarm shall automatically reset after a user-defined elapsed time.
 - v) The TVR 41 shall have automatic full screen associated alarm display that shall change as incoming alarms continue to arrive. As additional alarms arrive, the display monitor shall sequence between the cameras in alarm. It shall be possible, using the telemetry preset control described elsewhere in this specification, to utilize presets with associated alarm display to show the alarmed scene and surrounding escape paths during a high level alarm condition.

- vi) The TVR 41 shall provide status relays that shall link to alarms, motion detection, and video loss.
- vii) The TVR 41 shall have an alarm history display capable of showing the last 100 alarms received by the system.
- viii) The TVR 41 shall be supplied with push-in wire terminal connections to facilitate easy connection of alarms and other input/output signals.
- ix) The TVR 41 shall support notification on alarm to user accounts. The TVR 41 shall allow the user to program notification in response to any of the following conditions:
 - a) Hard disk full
 - b) Hard Disk Error
 - c) NTSC/PAL mismatch
 - d) Illegal Access
 - e) IP Address conflict
 - f) Network issues
 - g) Network access
 - h) Hard disk error
- i. RS-485 communications and networking
 - i) The TVR 41 shall provide a RS-485 bus and shall support RS-485 networking and control to facilitate operation of the following:
 - a) Remote control of system operation, setup, uploading and downloading, and system programming operations
 - b) Motorized PTZ control with selectable protocols per camera
 - c) Programmable presets on alarm
 - d) Up to 16 PTZ camera receivers
 - e) System integration
- j. RS-232 communications
 - i) The TVR 41 shall support RS-232 communications and control to facilitate:
 - a) Remote control of system operation, setup, and system programming operations
 - b) Text insertion shall be supported as follows:
 - 1) The TVR 41 shall accept 10 characters or 20 digits per line
 - 2) Each message shall be associated with a single camera.
 - 3) Four types of event text messages shall be supported:
 - A) Start of event (event mode is started and optional text string is stored with first event field)
 - B) End of event (event mode is stopped and optional text string is stored with next event field)
 - C) Event snapshot (at least one field from the event camera is recorded with an optional text string)
 - D) No change (text is added to next field of the selected camera without changing the camera's record rate)
 - 4) Text messages shall be discarded if the TVR 41 is not in record mode.

- 5) In full screen playback on the TVR 41, the text will be displayed on the field it was recorded with. Only the first 10 characters shall be displayed in a single line.
- 6) The color of the text is programmable on the live view page. Text shall not be updated more than once per second.

k. Ethernet communications

- i) The TVR 41 shall support LAN/WAN Ethernet access.
- ii) The TVR 41 shall support Ethernet bandwidths of 10 Mbps or 100 Mbps or 1000 Mbps.
- iii) The TVR 41 shall support simultaneous Ethernet access by not less than 16 workstations connected to the LAN/WAN.
- iv) The TVR 41 shall be provided with a Graphical User Interface (GUI) software for remote playback and viewing that shall support the Windows XP and Vista operating systems and full searching capabilities. It shall be possible to remotely set up the TVR 41 unit using the remote viewing software.
- v) The TVR 41 shall not stop recording during any Ethernet access, nor shall it be possible to remotely issue a command via Ethernet to stop the recording.
- vi) The TVR 41 shall allow the user to disable all Ethernet access from the menus by limiting the Total Net Bandwidth which functions as throttle.
- vii) The TVR 41 shall allow the user full programming of Ethernet parameters, including the following:
 - a) Ethernet (enable/disable)
 - b) Hostname
 - c) DHCP (enable/disable)
 - d) DDNS
 - e) IP address
 - f) Default gateway
 - g) Sub-net mask
 - h) Name Server
 - i) HTTP port
 - j) Main Port
 - k) UPnP

- l. The system shall be upgraded through flash programming upgrades of software, using either a USB drive or TCP/IP.

5. The TVR 41 shall have the following additional specifications:

a. Video

- i) Total available video memory shall be at least 1 GB.
 - a) Live/playback display memory shall be at least 128 MB.
 - b) Record memory shall be at least 72 MB.
- ii) Video sampling rate shall be at least 27 MHz.
- iii) Available colors shall be to specification YUV 4:2:2, providing up to 65K colors.
- iv) There shall be 256 grayscale levels.
- v) Horizontal resolution shall be 704 pixels.
- vi) Vertical resolution shall be:

- a) 480 active lines NTSC/EIA
 - b) 576 active lines PAL/CCIR
- vii) Inputs
 - a) Camera
 - 1) There shall be 16 camera inputs.
 - 2) Inputs shall use BNC connectors.
 - 3) Inputs shall be NTSC/EIA or PAL/CCIR compatible.
- b. Audio
 - i) There shall be per camera one associated and synchronized audio input
 - ii) 1 bidirectional audio line output
 - iii) The audio inputs shall use RCA connectors
 - a) Signal conditioning
 - 1) All inputs shall have automatic gain control.
 - 2) Video input signal 1.0 Vp-p 75Ω
- c. Outputs
 - i) The TVR 41 shall have three monitor outputs as follows:
 - a) One analog Multiscreen monitor-A output
 - 1) Composite video, BNC connector
 - 2) NTSC/EIA or PAL/CCIR compatible
 - 3) Shall display live, playback, and programming functions
 - b) One digital HDMI Multiscreen monitor-B output
 - 1) HDMI connector
 - 2) Shall display live, playback, and programming functions
 - c) One analog VGA Multiscreen monitor-C output
 - 1) VGA connector
 - 2) Shall be able to display all cameras live or in sequence mode
- d. The TVR 41 shall have a RS-232 serial data ports to support the following functionality:
 - i) Remote communications
 - ii) Transaction Text insertion
- e. The TVR 41 shall have 2 USB ports for:
 - i) USB memory key archiving devices
 - ii) USB HDD archiving devices
 - iii) Mouse control functions
- f. eSATA
 - i) The TVR 41 shall have an eSATA port for eSATA HDD archiving devices
- g. The TVR 41 shall have a removable strip for input/output connector to support the following functionality:
 - i) Alarm inputs
 - ii) Relay outputs
- h. Remote control

- i) The TVR 41 shall have an IR-remote that will emulate the front panel keys
- i. Mouse: The TVR 41 shall provide Mouse control support for
 - i) All menu settings and navigation functions
 - ii) Control functions live, playback, PTZ and archive
- j. Electrical
 - i) Input voltage: 100 to 240 VAC, 50 to 60 Hz
 - ii) Power: 126 W maximum
- k. Environmental
 - i) Operating temperature range -10 to +55°C
 - ii) Relative humidity: 10% to 90% non-condensing
- l. Mechanical
 - i) Dimensions shall be 445 x 470 x 90 mm, 19-inch (2U) EIA rack mounting.
 - ii) Weight shall be 11 kg maximum
- m. Compliance
 - i) FCC
 - ii) CE
 - iii) UL

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