OCTV Technical Specification.

Operational Parameters.

NOTE: This document is subject to change, owing to the implementation of technological advances.

Connectivity.

Wireless connectivity between camera and monitor can be achieved via GSM (900MHz or 1800MHz) or PCN (1900MHz). The connection can also be made over PSTN, LAN or WAN. LAN connection is via 10BaseT twisted pair. Dial-up connection requires RAS (Remote Access Service) to be present on the client platform.

Recording.

Images are captured at the camera at a rate of 1 per second. Images are captured at 320 x 240 pixels, 24 bit colour compressed using Wavelet compression prior to storage. Storage size is configurable from 4KB to 64KB.

Recommended minimum storage size is 14KB (factory set) per image, giving ~31 day's worth of storage at 1 frame per second on a standard (46.1GB HDD) camera.

Recording at the MOCTVC1 & C2 cameras can be started / stopped manually from the monitoring side. Recording of images received at the monitoring side when "logged on" to a camera occurs automatically.

Recordings at both camera and monitoring ends are made to a database in an encrypted form. Each frame is tagged to indicate the camera / monitor where the recording was made, timestamp, etc. A viewer application is supplied allowing the images to be displayed, printed, etc.

Transmission Speeds.

The bandwidth available for transmission of images over GSM is limited to 9600 bps, (28800 bps will soon be standard for the Orange network). There exists a trade-off between the quality of the image sent from the camera to the monitoring station and the video refresh rate. The larger (ie: the better quality), the image being sent, the slower the frame rate. A frame-size of 1.2KB will be transmitted at a frame rate of 1 frame every 2 seconds. For a connection with a bandwidth of 28800 bps (eg: TETRA, PSTN, HSCSD, GPRS), the image can be delivered at 2 frames per second.

With the use of H263+ codec a frame rate over HSCSD of 8 frames per second can be achieved..

Compression.

The compression method uses a Wavelet algorithm. For transmission bandwidths at or above 28800 bps an H263+ codec is used.

Limitations on Monitoring.

Monitoring multiple cameras simultaneously using dial-up networking requires multiple phone lines (or multiple mobile phones acting as modems), and therefore the monitoring platform must run an operating system which supports multiple modems for dial-out. In effect this has to be Windows NT Server, which in turn restricts the hardware platform to a desktop PC. At present we recommend a maximum of four cameras for simultaneous monitoring.
Monitoring software for viewing one camera at a time over dial-up networking is available for Windows 95/98/NT and Windows Pocket PC on any hardware platform (eg: desktop, laptop, handheld or palmtop).

There is no theoretical limit to the number of simultaneous connections which can be made to multiple camera connected over a LAN, other than network bandwidth. Bandwidth utilisation can be restricted to a ceiling level, configurable for each camera. Optional, configurable key-frame refresh is available with H263+ transmission, which can be helpful in ensuring acceptable picture quality over a network prone to occasional packet loss.

Component Specifications.

MOCTVC1 And MOCTVC2 Camera.

We currently use the Sanyo VCC-4312P Day/Night Camera

The optical filter is switched automatically to colour image or black and white according to the subject brightness.
Built-in interline transfer method 1/3" CCD, approx. 320,000 picture elements.
Low smear, anti-blooming, low lag, no burning and no geometric distortion using the CCD solid state image device.
100% solid state components giving excellent immunity to shock and vibration.
Not subject to interference from magnetic or electrostatic fields.
High sensitivity, minimum required illumination required is 0.05 lux (F1.2)

Scanning system	:	PAL standard, (625 TV Lines, 25 frames/sec.)
Interlace	:	PLL 2:1 interlace
Image device	:	1/3 inch solid state image device CCD
Picture Elements	:	537 (H) x 597 (V)
Effective Picture Elements	:	500 (H) x 582 (V)
Synchronising system	:	Internal sync, External sync (Automatic switching)
Resolution	:	330 TV lines horizontally, 400 TV lines vertically
Video output level	:	1.0 Vp-p/75 ohms, composite
Video S/N ratio	:	More than 48dB
Minimum required illumination	:	Approx 0.05 lux with F 1.2 lens (B/W mode)
(Incandescent lighting)	:	Approx 1.0 lux with F 1.2 lens (colour mode)
Electronic shutter	:	8 speeds, selectable by switches:
		(1/50, 1/120, 1/250, 1/500, 1/1000, 1/2000, 1/4000,
		1/10000 sec.)
Backlight compensation	:	Manual ON/OFF switching, Multi-zone light measuring
		System, (Active when using auto-iris lens)
Iris function	:	Manual ON/OFF switching
Electronic iris range	:	1 lux to 50,000 lux (F 1.2, lens: colour mode)
		1.4 lux to 70,000 (F1.4, lens: colour mode)
Flange-back	:	12.5mm +/- 0.5mm
White balance	:	ATW/Manual switching
Lens Mount	:	CS mount (or C mount with the supplied adaptor)
Environmental conditions	:	Temperature: -10 degrees C ~ =50 degrees C
		Humidity: less than 90% (no condesation)

Power supply	:	12Vdc (supplied from AC adaptor)
Power requirement	:	12-15 Vdc/210-170mA (with auto-iris lens)
Weight	:	Approx 450g (without lens)

MOCTVC1 and MOCTVC2 Lens.

We currently use the Yamano Y15P
Auto Focus, Auto Iris, 15:1 zoom capability, C/CS mount.

The Auto Focus operates by sampling the video output of the camera. This must be a composite video signal, which is composed of both vertical and horizontal synchronising signals in either NTSC or PAL format.

NOTE: Vertical and Horizontal signals are required by the built-in microprocessor for the Auto Focus to function correctly. The sampling of the iris output (video output) is not recommended as some cameras have iris outputs that do not have vertical and horizontal synchronising signals.

NOTE: Due to the marginal capability of the video auto focus, the auto focus may have problems focusing under the following conditions.

The object is too dark
The object shows no clear contrast between light and shade
Shooting a high luminance spotlight
These are both far and near objects in the centre of the picture
The object moves too quickly

Lens Format	:	1/3 inch
Power requirement	:	Iris & Zoom control, 8-12Vdc @ 40mA
		Focus & Auto-iris, 8-12Vdc @ 80mA
Focal length	:	7.5-112.5mm, (15:1 zoom)
F stop	:	1.6
Iris speed through operation	:	2.5 – 3.5 seconds adjustable
Zoom speed through operation	:	2 - 7 seconds adjustable
Focus speed through operation	:	2 - 7 seconds adjustable
Preset capability		

MOCTVC1, C2, C6 and C7, On-Board PC.

We currently use the Mitac MSC–6540A Embedded PC

Processor Speed	:	450MHz, AMD K6-2
RAM size	:	64MB
Primary Hard Drive Size	:	20Gbytes
Secondary Hard Drive size	:	27.3 Gbytes
Video Capture	:	PAL and NTSC compatible
		320 x 240 24bit colour capture for full frame (wavelet) video
		176 x 144 24bit colour capture (QCIF) for H263+ video
Operating System	:	Microsoft Windows NT4.0 workstation
Start-up Power	:	90 Watts
Stabilised running power	:	66 Watts
Bus Clock Rate	:	60/66/75/83/95/100 MHz external bus speed
Processor Voltage	:	2.0V to 3.5V

Chipset	:	ALI M1541 North Bridge Chip Set
		Host bus at 60/66/75/83/100 MHz
		Supports Pseudo Synchronous AGP and PCI Bus access
		Supports pipelined-burst SRAM cache
		Supports FPM/EDO/SDRAM
	:	ALI M1543c South Bridge Chip Set with super I/O & FIR
		Supports PCI Master and Slave interface, PCI spec. 2.1 compliant
		Supports 7 Programmable Channels Enhanced DMA
		Supports Plu-and-Play and 14 interrupt channels
		Built-in PS/2 AT keyboard and PS/2 mouse controller
		Supports ACPI and OS Directed Power Management
		Supports Ultra 33 Synchronous DMA Mode and USB Interface
		Supports ECP/EP/SPP Standard Mode parallel port
		Supports high performance 16550 UARTs serial ports
		Supports IrDA 1.0 (SIR) and IrDA 1.1 (MIR and FIR)
Main Memory	:	one 168-pin DIMM socket for up to 256 SDRAM
		Supports SDRAM and ECC?Parity checking
L2 Cache	:	Onboard 512KB Pipelined burst SRAM
BIOS	:	AMI Plug-and-Play Flash BIOS
Enhanced IDE Interface	:	One bus mastering EIDE interface supporting mode 4 devices, up to 2 IDE devices. It supports PIO mode 4 and Ultra DMA/33
FDD Interface	:	Supports up to two floppy disk drive (3.5" and 5.25")
		Supports 360K/720K/1.2M/1.44M/2.88M format
Serial Ports	:	Two RS-232 and two RS-232/422/485 interface
Parallel Ports	:	One port which supports Standard Parallel Port (SPP), Enhanced Parallel Port (EPP), and Extended Capability Port (ECP) modes
Keyboard/Mouse Connectors	:	Onboard 5-pin headers/connectors are available for keyboard and mouse
USB	:	Two USB ports
		USB V1.0 Intel Universal HCI V1.1 compatible
Onboard SSD	:	M-system Disk on chip flash disk, 2MB to 144MB storage capacity
Onboard VGA	:	C&T 69000 Chipset with AGP interface
		2MB of display memory built-in chipset
PC/104 Expansion Bus	:	PC/104 expansion
		104 pin, 16 bit PC/104 module connector
PCI Expansion Bus	:	One PCI Expansion Bus Slot supported
Audio Function	:	ESS SOLO-1 ES1938S Audio Drive is a single, mixed-signal, 32-bit stereo VLSI Chip
		High quality 20 voice ESFM music synthesiser
		Support full-duplex function
		Line-out (6W AMP), line-in, mic-in (cable connector onboard)
Ethernet Function	:	Realtek RTL8139A single Chipset 10/100 Base-T supports RJ-45 connector onboard
IrDA Function	:	One IrDA header
		Supports IrDA 1.0 (SIR) and IrDA 1.1 (MIR and FTR)
Hardware Monitoring	:	Genesys GL518SM IC chipset – monitoring CPU temperature, system temperature, voltage, CPU and chassis fan speeds
Watchdog Timer	:	3-level programmable watchdog timer

Other Features	:	Supports Modem ring-on
		Supports Wake on LAN
		Supports AGP (Accelerated Graphics Port)
Power Management	:	Power management setup via BIOS
Power Connector	:	6-pin header for AT power
		20-pin header for ATX power
Power Supply Requirements	:	+5V (4.75~5.25V)
		+12V (11.4~12.6V)
Dimensions (LxW)	:	203mm x 146mm (8" x 5.7")
Environmental Specifications	:	Operating Temperature 0°C to 60°:C (32°F to 140°F)
		Storage Temperature –20°C to 85°C (-4°F to 185°F)
		Relative Humidity 5% to 95% (non-condensing)
MTBF	:	50,000 hours
EMI	:	FCC Class A and CE approved

MOCTVC1, C2, C6 and C7 Video Capture Card.

We currently use the Hauppauge WINTV PCI video capture card, model No: 111.

The WINTV PCI ids a digital video in-lay board with TV, image and clip capture plus intercast data or Teletext data reception. A bus-master PCI slot is required, plus a VGA card with DirectDraw 3.0 (or later) and Windows 95. In addition to displaying live video in a window, individual images and video clips can be digitised and stored to disk.

Live video is digitised from either the built-in 125-channel cable TV tuner or an external video-input source using high quality 4:2:2 video sampling. The digitised video is sent over the PCI bus in your PC into the memory of your VGA display adapter. This allows the digitised video to move effectively, and takes a fraction of the available bandwidth of the PCI bus.

Pull down Menus	:	Source select, image adjust (contract, brightness, saturation, hue), options (remove title bar, remove toolbar, always-on-top, show size, aspect ratio, etc)
File Save	:	BMP, TIF, GIF, JPEG in 8 and 24-bit b/w or colour. Saved image is current window size up to maximum image size.
Channel surf	:	Quickly scans through the active channels on your TV network. Shows 16 channels in your WinTV window at a time
Print Commands	:	Page Setup, Printer Setup, Print. Can print colour or black/white
Copy to Clipboard	:	supports Microsoft DIB and BMP files. 8-bit colour, 8-bit B/W and 24-bit colour supported
Source Select	:	tuner, up-channel, down-channel, Auxiliary Video1, Auxiliary Video2, S-video
Audio Adjust	:	volume up, volume down. Dbx_TV version also allows mono/stereo and SAP setting
Channel selector	:	Channel names, automatic channel scan, fine tune, source select, world region
Software requirements	:	Microsoft Windows 95

MOCTVC1, C2, C6 and C7 Primary (operational) Hard Drive.

We currently use a IBM Deskstar 25GP, with a 20.3Gbyte capacity.

Interface	:	ATA-4
Capacity	:	20.3 Gbyte
Sector Size	:	512 Bytes
Recording zone	:	12
User cylinders (physical)	:	15,302
Data heads (physical)	:	10/8/6/4
Data disks	:	5/ 4/ 3/ 2/
Areal Density (Max)	:	3740 Mbits/sq.in.
Max recording density (BPI)	:	233.8K
Track density	:	16,000 TPI
Data Buffer (KB)	:	2000[1]
Rotational Speed	:	5400 RPM
Latency (average)	:	5.56ms
Media Transfer Rate (max)	:	195.6 Mbits/sec
Interface Transfer (max)	:	66.7 MB/sec
Sustained data rate	:	15.5-8.7 MB/sec
Seek time (read typical)	:	
Average	:	9.0 ms
Track to Track	:	2.2 ms
Full Track	:	15.5 ms
Error Rate (non-recoverable)	:	1 in 10E13
Contact Start Stop (below 40°C)	:	40,000
Power Requirement	:	+5Vdc ($^+/.$5%), +12Vdc (+10% -8%)
Power Dissipation (typical)	:	
Start Up (max peak)	:	0.65 (5V), 2.00(12V)
Idle (W)	:	4.9/3.4
Power Consumption Efficiency		
(watts/MB)	:	0.0002
Physical size	:	25.4mm (H) x 101.6mm (W) x 146mm (D)
Weight (max g)	:	630
Ambient Operating temperature	:	5 to 55°C
Ambient Non-operating temp	:	-40 to 65°C
Relative Humidity		
(non-condensing)	:	8 to 90% RH
Non-operating relative humidity		
(non-condensing)	:	5 to 95%
Maximum Wet Bulb	:	29.4^{o}C
Shock (half sine wave)	:	10 G/11 ms or 65 G/2 ms
Vibration (random [RMS])	:	0.67 horizontal, 0.56 vertical

MOCTVC1, C2, C6 and C7 Secondary (video recording) Hard Drive.

We currently use a IBM Deskstar 34GXP, with a 27.3Gbyte capacity.

Interface	:	ATA-66
Capacity	:	27.3 Gbyte
Sector Size	:	512 Bytes
Recording zone	:	12
User cylinders (physical)	:	17,688
Data heads (physical)	:	10/8/6/4
Data disks	:	5/ 4/ 3/ 2/
Areal Density (Max)	:	5154 Mbits/sq.in.
Max recording density (BPI)	:	282K
Track density	:	18,300 TPI
Data Buffer (KB)	:	2 MB[1]
Rotational Speed	:	7200 RPM
Latency (average)	:	4.17ms
Media Transfer Rate (max)	:	284 Mbits/sec
Interface Transfer (max)	:	66.7 MB/sec
Sustained data rate	:	14.1 to 23.4 MB/sec
Seek time (read typical)	:	
Average	:	9.0 ms
Track to Track	:	2.2 ms
Full Track	:	15.5 ms
Error Rate (non-recoverable)	:	1 in 10E13
Contact Start Stop (below 40°C)	:	40,000
Power Requirement	:	+5Vdc ($^+$/.5%), +12Vdc (+10% -8%)
Power Dissipation (typical)	:	
Start Up (max peak)	:	1.0 (5V), 2.0(12V)
Idle (W)	:	4.9/3.4
Power Consumption Efficiency		
(watts/MB)	:	0.0001
Physical size	:	25.4mm (H) x 101.6mm (W) x 146mm (D)
Weight (max g)	:	630
Ambient Operating temperature	:	5 to 55°C
Ambient Non-operating temp	:	-40 to 65°C
Relative Humidity		
(non-condensing)	:	8 to 90% RH
Non-operating relative humidity		
(non-condensing)	:	5 to 95%
Maximum Wet Bulb	:	29.4^{o}C
Shock (half sine wave)	:	10 G/11 ms or 65 G/2 ms
Vibration (random [RMS])	:	0.67 horizontal, 0.56 vertical

MOCTVC1, C2 and C7 Telemetry Receiver.

We currently use the 15 function Shawley Telemetry Receiver, designed for the MOCTVC1 unit.

Operational Functions	:	Pan / Tilt / Zoom / Focus / Iris / Wash / Wipe / Aux 3 / Aux 4 (volt free) / Auto-Iris
Presets	:	Can store up to 99 programmed preset positions
Tour	:	Can operate a programmed tour continuously or single shot
Alarm Capability	:	Can accept 4 alarm inputs, programmable for Normally Closed or Normally Open
Data Inputs	:	RS232 / RS485
Power requirements	:	12Vdc @ 100mA
Voltage Switching	:	24 / 110 / 240 Vac

MOCTVC1 and C2 Weatherproof Camera Housing.

We currently use the Shawley CH8 camera housing.

Construction	:	16 gauge aluminum
Weatherproof rating	:	IP66
Operating Temperature Range	:	-20°C to +50°C (BS2011 part Nb).
Humidity	:	93RH +/-2% @ +50°C (part Cb).
Heater Power Consumption	:	(100 Watts) 8 Watts[*]
Heater Operating Voltage	:	100-240Vac
Dimensions		
External	:	624mm(L) x 216mm(W) x 217mm(H)
Internal	:	510mm(L) x 125mm(W) x 151mm(H)
Finish	:	Oyster hammer and white powder coat

[*]NOTE: The heating element in the camera housing is a PTC device. It operates at a nominal constant temperature and variable power. More power is supplied when the element is cold or in a cold environment and less power is supplied when the heating element has reached its working temperature or is in a warm environment.

The maximum power is obtained when the element is first switched on. This phase is known as the "inrush" and lasts for a few seconds. The inrush power is around 50 Watts (per heater) at an ambient environmental temperature of 20°C. After in the inrush, the element reaches a steady state constant power operation of 4 Watts at an ambient of 20°C.

MOCTVC6 and C7 Stand-alone Weatherproof Box.

Construction	:	16 gauge aluminum
Weatherproof rating	:	IP66
Dimensions External	:	500mm(L) + 35mm glands x 400mm(W) x 200mm(H)
Finish	:	RAL 7032 grey

If the Telemetry receiver and removable hard drive are not required, then the above unit can be reduced to a size of 300mm (L) x 200mm (W) x 200mm (H).

MOCTVC1 and C2 Wiper Unit.

We currently use the Shawley W846 wiper unit.

Construction	:	Steel case – zinc plated and then stove enameled. Gives good R.F.I. protection.
Weatherproof rating	:	IP65
Operating Temperature Range		
Without Heaters	:	-15°C to $+55^{o}$C
With Heaters	:	-30°C to $+55^{o}$C
Operating voltage	:	240 Vac
Frequency	:	50 or 60[*] Hz
Power Consumption	:	6.45VA
Nominal Current at 240Vac	:	28mA Continuous
Capacitor Value	:	0.18/500 $_u$f/Vac
Speed of Operation	:	20 cycles (wipes) per minute – self parking.
Size	:	105mm (W) x 85mm (H) x 120mm (L)
Weight	:	3.5Kg
Humidity	:	Acc IEC 68 Test Db 40°C 21 days
Optional Heaters	:	Thermostatically Controlled[*]
Finish	:	Oyster hammer and white powder coat

MOCTVC1 Pan and Tilt Unit.

We currently use the Shawley earl 565 pan & tilt head.

Construction	:	Aluminum Die casting/ Injection Molded Nylon
Weatherproof rating	:	IP66
Pan Speed	:	8.5^{o}/sec (optional high speed 13°/sec)
Tilt Speed	:	2.5^{o}/sec (optional high speed 6°/sec)
Pan Braking Torque	:	90 Kg.cm
Tilt Braking Torque	:	340 Kg.cm
Backlash	:	Better than 0.15^{o}
Overrun	:	NIL
Pan Angle	:	$+360^{o}$
Tilt Angle	:	$+180^{o}$
Limit Adjustment	:	Internal Manual Setting
Mounting Details	:	4 M8 screws on 101.6 pcd
Weight	:	9 Kg
Power Consumption	:	12VA per motor
Operating Temperature Range	:	-20°C to $+50^{o}$C
Carrying Capacity	:	15Kg (top mount) / 22Kg (side mount) Balanced load
Potentiometers	:	MTBF ~ 15,000 hours with a duty cycle of less than 30%
Finish	:	Oyster hammer and white powder coat.

MOCTVC1 Wall Mounting Bracket.

We currently use the Shawley WB4.

Construction	:	16 gauge mild steel
Length off wall	:	420mm
Finish	:	Black Powder Coat

MOCTVC1 Angled Column Spacer.

We currently use the Shawley CS/9A

Construction	:	16 gauge mild steel
Length off WB4	:	229mm
Finish	:	Black Powder Coat

Monitoring Station (minimum requirements).

MOCTVM1 Desktop Unit.

Processor	:	>350MHz
RAM	:	32MB for Windows 95/98, 64MB for Windows NT
Hard Drive capacity	:	The software uses approximately 400MB of disk space, however as the system records the images received on the monitoring stations hard drive when logged on it is recommended that a hard drive of at least 3.2GB is used.
Serial Ports	:	Dependant upon how many cameras are to be accessed simultaneously. (maximum of 4 at one time). RS-232C, (16550 UART compatible).
Video RAM	:	To allow 64K colour minimum.
Graphics Controller	:	>64 bit
Parallel Printer Port		
Operating System	:	Windows 95/98 for accessing one camera. Windows NT server for accessing multiple cameras
Modem	:	Standard 56kps (Hays compatible) for land line TDK Globalpulse datasuite for mobile line

MOCTVM2 Note Book PC.

Processor	:	>350MHz
RAM	:	32MB for Windows 95/98
Hard Drive capacity	:	The software uses approximately 400MB of disk space, however as the system records the images received on the monitoring stations hard drive when logged on it is recommended that a hard drive of at least 3.2GB is used.
Serial Port	:	RS-232C, (16550 UART compatible).
Video RAM	:	To allow 64K colour minimum.
Graphics Controller	:	>64 bit
Parallel Printer Port		
Operating System	:	Windows 95/98 for accessing one camera.
Modem	:	Standard 56kps (Hays compatible) for land line TDK Globalpulse datasuite for mobile line
Display	:	13" DSTN screen or equivalent 800 x 600 x 16M colours

MOCTVM5 and MOCTVC5 Palm PC.

We currently use the Casio E115 palm PC, however earlier units used the Casio E105.

Display	:	240 x 320 dots, TFT Colour LCD (65,536 colours)
CPU	:	VR4121
Memory	:	32MB
Interfaces		
Serial	:	RS-232C, 115.2 kbps (max)
Infrared	:	IrDA Ver 1.0, 115.2 kbps (max)
		Range: 30cm max
Card Slot	:	Compact Flash card, 3.3V Type I / Type II
Power Supply		
Main	:	Rechargeable battery pack JK-210LT (Lithium-Ion battery)
		AC adapter (AD-C50200)
Back-up	:	One CR2032 lithium battery
Power Consumption	:	3.6 Watts

Approximate Battery Life (Normal temperature)

Casio Main	:	(Actual time may be shorter due to conditions when charging)
6 Hours	:	Continuous input and data display at a ration of 1:10, with screen brightness at lowest possible level.
3 Hours	:	Continuous communication using the optical modem card (JK-711MC56, US and Canada only), with screen brightness at lowest possible level
	:	Even when the unit is turned off, small amounts of power are required to retain memory contents, etc. This can cause batteries to go dead even when you do not use the unit.
Casio Back-up		
5 Years	:	Main battery is charged or replaced immediately after appearance of message to replace main battery
1 Week	:	No battery replacement after appearance of message to replace main battery
Approximate Charge Time	:	5 to 6 hours, charge time is longer for the first charges after
(Normal Temperature)	:	purchasing the unit or installing a new battery pack
Operating Temperature	:	0°C to 40°C
Dimensions		
Casio	:	131.2mm (L) x 83.6mm (W) x 20mm (H)
MOCTV unit	:	195mm (L) x 135mm (W) x 60mm (H)
Weight		
Casio	:	255g
MOCTV unit	:	1.5Kgs

Casio Camera unit

CCD	:	350,000 pixels
Lens	:	Fixed focus lens with macro position
		F=2.8, focusing distance = 4.6mm
Approximate Focus Range		
Normal	:	780mm to infinity
Macro	:	100mm
Shutter Speed	:	1/30 to 1/10,000 second (auto)
Record Modes	:	Still image (440 max), continuous movie (15 x 30 second length)

OCTV Solar Panel.

Name: **"OCTV" Solar Power Supply.**

Description: An integrated PV Power source / load controller for OCTV Video over wireless systems.

Features

- Can be fully installed by the user

- Battery depth of discharge is controlled by actual Ah measurement

- Safe load duration and magnitude determined every day by an expert system

- Programmed battery charge profiles with Pulse Width Modulated voltage control

- Battery depth of discharge and insolation data are logged in non volatile memory

- Short circuit protected output sockets.

- Reverse polarity and short circuit protected PV and battery charger input sockets

The "OCTV" Solar Power Supply.

How it works

As battery charging proceeds during the day the controller monitors PV current, battery voltage, battery temperature, and daytime load current.

It also controls the battery voltage according to the battery type, battery capacity, temperature, and the desired charging profile, and temperature compensation as approved by the manufacturer.

The controller acquires and stores the input and output Ah and the battery voltage and temperature profile for the day and continuously computes the energy balance in the system and the SOC of the battery.

A summary of each day's energy balance and the load magnitude decision is logged in non volatile memory for audit purposes. The actual delivered load kWh for each day is also logged

Controlling the system energy flows

The system delivers the maximum possible safe amount of energy every day

This value is recorded against the insolation received thus providing a system performance audit.

The battery is never discharged beyond a defined and actually measured limit in Ah

Safety

All outputs are current limited, short circuit proof, self resetting and ESD protected

All inputs are current limited, short circuit proof, ESD and reverse polarity protected

PV module connection

A three pin connector is used to plug in the PV module that comes supplied with a plug already fitted. The PV socket also accepts a conventional 12Volt battery charger input.

System Controller specifications:

Nominal dc voltage	12.6	Volts
Peak dc voltage	14.1	Volts
Minimum dc voltage	12.0	Volts
Battery charge algorithm	As specified by battery manuf.	
Battery capacity (min)	48	Ah
Battery capacity useable	**24**	**Ah**
Output load circuit - peak short circuit current	7	Amps
Short circuit recovery delay	5	minutes *
Output load circuit - current limit	6	Amps
Nominal individual load circuit capacity	30	Watts
Output load circuit - voltage withstand	75	Volts (Note 1)
Output load circuit ESD (human body model)	4	kV (Note 2)
Master Solid State circuit breaker trip (ISO)	12.6	Amps (Note 3)
Maximum current on PV input	10	Amps
Maximum voltage on PV input	50	Volts
PWM ripple voltage on battery	60	mV (Max.)
"Watchdog"	2	Int. & External
Battery Temperature measurement	±0.5	°C
Battery voltage resolution	±2.5	mV
PV voltage resolution	±2.5	mV
Load Ah resolution	±2.5	%
Parasitic power consumption	2	mW
Lightning discharge clamping voltage	50	V (8mSec)

(Note 1) According to ISO 7637-1. DIN 40839
(Note 2) MIL-STD883D, ESD & Assn.std.S5.1-1993
(Note 3) Independent hardware controller cuts in if there is a serious software fault

Shawley Ltd reserves the right to alter specifications without notice