INSTRUMENTS

G09G ARRANGEMENTS OR CIRCUITS FOR CONTROL OF INDICATING DEVICES USING STATIC MEANS TO PRESENT VARIABLE INFORMATION

NOTES
1. This subclass covers indicator consoles, i.e. arrangements or circuits for processing control signals to achieve the display, e.g. for the calling up, reception, storage, regeneration, coding, decoding, addressing of control signals.
2. This subclass does not cover the structural details of the indicating devices, such as panels or tubes per se, or assemblies of individual light sources, which are covered by the relevant subclasses, e.g. H01J, H01K, H01L, G02F, G09F, H05B.
3. Contrary to subclass H04N, in which are classified display devices capable of representing continuous brightness value scales, this subclass is limited to devices using only a discrete number of brightness values, e.g. visible/non-visible.
4. The visual effect may be produced by a luminescent screen scanned by an electron beam, directly by controlled light sources, by projection of light, from controlled light sources onto characters, symbols, or elements thereof drawn on a support, or by electric, magnetic, or acoustic control of the parameters of light rays from an independent source.

WARNING
In this subclass non-limiting references (in the sense of paragraph 39 of the Guide to the IPC) may still be displayed in the scheme.

1/00 Control arrangements or circuits, of interest only in connection with cathode-ray tube indicators;
   (General aspects or details, e.g. selection emphasis on particular characters, dashed line or dotted line generation; Preprocessing of data) (cathode-ray oscilloscopes G01R 13/20; radar display arrangements G01S 7/04; display of digital non-picture data in television systems H04N 7/0255))

1/06 . using single beam tubes (G09G 1/26, G09G 1/28 take precedence), (e.g. three-dimensional or perspective representation, rotation or translation of display pattern, hidden lines, shadows (G09G 1/28 takes precedence; stereoscopic TV-systems, details thereof H04N 13/00; oscilloscopes for three-dimensional representation G01R 13/206; vectorscopes G01R 13/208))

1/07 . with combined raster scan and calligraphic display

1/08 . the beam directly tracing characters, the information to be displayed controlling the deflection [and the intensity] as a function of time in two spatial co-ordinates, e.g. according to a cartesian co-ordinate system

1/10 . the deflection signals being produced by essentially digital means, e.g. incrementally

1/12 . the deflection signals being produced by essentially analogue means
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1/14  ... the beam tracing a pattern independent of the information to be displayed, this latter determining the parts of the pattern rendered respectively visible and invisible

1/143 ... [Circuits for displaying horizontal and vertical lines]

1/146 ... [Flicker reduction circuits]

1/16 ... the pattern of rectangular co-ordinates extending over the whole area of the screen, i.e. television type raster

1/162 ... [for displaying digital inputs as analog magnitudes, e.g. curves, bar graphs, coordinate axes, singly or in combination with alpha-numeric characters (cathode-ray oscilloscopes for displaying analog inputs, singly or in combination with alpha-numeric characters G01R 13/20; television receiver circuitry for displaying supplementary, e.g. alpha-numeric, information H04N 5/445)]

1/165 ... [Details of a display terminal using a CRT, the details relating to the control arrangement of the display terminal and to the interfaces thereto (details suitable for both CRT and flat panel G09G 5/003; specific for a flat panel G09G 3/2092)]

1/167 ... [Details of the interface to the display terminal specific for a CRT (details suitable for both CRT and flat panel G09G 5/006, specific for a flat panel G09G 3/2096)]

1/18 ... a small local pattern covering only a single character, and stepping to a position for the following character, e.g. in rectangular or polar co-ordinates, or in the form of a framed star

1/20 ... using multi-beam tubes (G09G 1/26, G09G 1/28 take precedence)

1/22 ... using tubes permitting selection of a complete character from a number of characters ([tubes therefor H01J 31/16])

1/24 ... using tubes permitting selection of individual elements forming in combination a character { see provisionally also G09G 1/23]}

1/26 ... using storage tubes {tubes therefor H01J 31/58]

1/28 ... using colour tubes {tubes therefor H01J 31/20]

1/285 ... [Interfacing with colour displays, e.g. TV receiver]

3/00 Control arrangements or circuits, of interest only in connection with visual indicators other than cathode-ray tubes

WARNING

Group G09G 3/00 is impacted by reclassification into groups G09G 3/03 and G09G 3/035. Groups G09G 3/00, G09G 3/03, and G09G 3/035 should be considered in order to perform a complete search.

3/002 ... [to project the image of a two-dimensional display, such as an array of light emitting or modulating elements or a CRT]

3/003 ... [to produce spatial visual effects]

3/004 ... [to give the appearance of moving signs]

3/005 ... [forming an image using a quickly moving array of imaging elements, causing the human eye to perceive an image which has a larger resolution than the array, e.g. an image on a cylinder formed by a rotating line of LEDs parallel to the axis of rotation]

3/006 ... [Electronic inspection or testing of displays and display drivers, e.g. of LED or LCD displays (testing individual LED's G01R 31/2635; testing lamps G01R 31/44; testing of optical features of LCD displays G02F 1/1309)]

3/007 ... [Use of pixel shift techniques, e.g. by mechanical shift of the physical pixels or by optical shift of the perceived pixels]

3/008 ... [forming an image on an image carrier by relative movement of a writing unit to the image carrier, e.g. on a photoconductive rotating belt, or on an electronic blackboard]

3/02 ... by tracing or scanning a light beam on a screen

3/025 ... [with scanning or deflecting the beams in two directions or dimensions]

3/03 ... [specially adapted for displays having non-planar surfaces, e.g. curved displays]

WARNING

Group G09G 3/03 is incomplete pending reclassification of documents from group G09G 3/00. Groups G09G 3/00 and G09G 3/03 should be considered in order to perform a complete search.

3/035 ... [for flexible display surfaces]

WARNING

Group G09G 3/035 is incomplete pending reclassification of documents from groups G09G 3/00 and G09G 2380/02. Groups G09G 3/00, G09G 2380/02, and G09G 3/035 should be considered in order to perform a complete search.

3/04 ... for presentation of a single character by selection from a plurality of characters, or by composing the character by combination of individual elements, e.g. segments ([a combination of such display devices for composing words, rows or the like, in a frame with fixed character positions])

3/045 ... [Selecting complete characters]

3/06 ... [controlled light sources]

3/08 ... [using incandescent filaments]

3/10 ... [using gas tubes]

3/12 ... [using electroluminescent elements]

3/14 ... [Semiconductor devices, e.g. diodes]

3/16 ... [by control of light from an independent source]

3/18 ... [using liquid crystals]

3/19 ... [using electrochromic devices]
for presentation of an assembly of a number of characters, e.g. a page, by composing the assembly by combination of individual elements arranged in a matrix (no fixed position being assigned to or needed to be assigned to the individual characters or partial characters)

Display of colours (specific for liquid crystal displays G09G 3/3607)

Display of intermediate tones

[amplitude modulation]

[modulation of the duration of a single pulse during which the logic level remains constant]

[time modulation using two or more time intervals]

[using sub-frames]

(the sub-frames having all the same time duration)

(the sub-frames having non-binary weights)

(with splitting one or more sub-frames corresponding to the most significant bits into two or more sub-frames)

(with specific control of sub-frames corresponding to the least significant bits)

[using sub-frame groups]

[using dithering]

[with addition of random noise to an image signal or to a gradation threshold]

[with use of a spatial dither pattern]

[the pattern being varied in time]

[using error diffusion]

[using error diffusion in time]

[using error diffusion in both space and time]

[by domain size control (G09G 3/3637 takes precedence)]

[by a combination of two or more gradation control methods]

[with combination of amplitude modulation and time modulation (space and time error diffusion G09G 3/2065)]

[Special arrangements for addressing the individual elements of the matrix, other than by driving respective rows and columns in combination]

[with use of a plurality of processors, each processor controlling a number of individual elements of the matrix]

[Details of a display terminals using a flat panel, the details relating to the control arrangement of the display terminal and to the interfaces thereto (suitable for both CRT and flat panel G09G 5/003; specific for a CRT G09G 1/165)]

[Details of the interface to the display terminal specific for a flat panel (suitable for both CRT and flat panel G09G 5/006; specific for a CRT G09G 1/167)]

[using controlled light sources]

[using incandescent filaments]

[to give the appearance of moving signs]

[using luminous gas-discharge panels, e.g. plasma panels]

(Display of gradations (G09G 3/288 takes precedence))

[display activated by high-frequency signals specially adapted therefor]

[using alternating current [AC] - direct current [DC] hybrid-type panels]

[using DC panels]

[using self-scanning]

[using AC panels]

[using self-shift panels [with sequential transfer of the discharges from an input position to a further display position]]

[controlling the gas discharge to control a cell condition, e.g. by means of specific pulse shapes]

[for reset discharge, priming discharge or erase discharge occurring in a phase other than addressing]

[Details of erasing]

[Details of priming]

[Details of initialising]

[for address discharge]

[Addressed by writing selected cells that are in an OFF state]

[Addressed by erasing selected cells that are in an ON state]

[being addressed only once per frame]

[for lighting or sustain discharge]

[with special waveforms to increase luminous efficiency]

[by varying the frequency of sustain pulses or the number of sustain pulses proportionally in each subfield of the whole frame]

[by introducing variations of the frequency of sustain pulses within a frame or non-proportional variations of the number of sustain pulses in each subfield]

[by increasing the total sustaining time with respect to other times in the frame]

[Driving circuits for producing the waveforms applied to the driving electrodes]

[using inductors for energy recovery]

[using opposed discharge type panels]

[using surface discharge panels]

[using non-standard pixel electrode arrangements]

[with more than 3 electrodes involved in the operation]

[using alternate lighting of surface-type panels]

[using electroluminescent panels]

[semiconductive, e.g. using light-emitting diodes [LED]]

[organic, e.g. using organic light-emitting diodes [OLED]]

[using a passive matrix]

[using an active matrix]
3/3233 . . . . . . . with pixel circuitry controlling the current through the light-emitting element
3/3241 . . . . . . . the current through the light-emitting element being set using a data current provided by the data driver, e.g. by using a two-transistor current mirror
3/325 . . . . . . . the data current flowing through the driving transistor during a setting phase, e.g. by using a switch for connecting the driving transistor to the data driver
3/3258 . . . . . . . with pixel circuitry controlling the voltage across the light-emitting element
3/3266 . . . . . . . Details of drivers for scan electrodes
3/3275 . . . . . . . Details of drivers for data electrodes
3/3283 . . . . . . . in which the data driver supplies a variable data current for setting the current through, or the voltage across, the light-emitting elements
3/3291 . . . . . . . in which the data driver supplies a variable data voltage for setting the current through, or the voltage across, the light-emitting elements
3/34 . . . . . . . by control of light from an independent source
3/3406 . . . . {Control of illumination source (illumination devices structurally associated with liquid crystal cells G02F 1/1336)}
3/3413 . . . . {Details of control of colour illumination sources}
3/342 . . . . . . . [using several illumination sources separately controlled corresponding to different display panel areas, e.g. along one dimension such as lines]
3/3426 . . . . . . . (the different display panel areas being distributed in two dimensions, e.g. matrix)
3/3433 . . . . . . . [using light modulating elements actuated by an electric field and being other than liquid crystal devices and electrochromic devices (using liquid crystal devices G09G 3/36; using electrochromic devices G09G 3/38)]
3/344 . . . . . . . [based on particles moving in a fluid or in a gas, e.g. electrophoretic devices (electrophoretic devices per se G02F 1/167)]
3/3446 . . . . . . . [with more than two electrodes controlling the modulating element]
3/3453 . . . . . . . [based on rotating particles or microelements]
3/346 . . . . . . . [based on modulation of the reflection angle, e.g. micromirrors (micromirrors devices per se G02B 26/0833)]
3/3466 . . . . . . . [based on interferometric effect]
3/3473 . . . . . . . [based on light coupled out of a light guide, e.g. due to scattering, by contracting the light guide with external means]
3/348 . . . . . . . [based on the deformation of a fluid drop, e.g. electrowetting]
3/3486 . . . . . . . [using light modulating elements actuated by a magnetic field]
3/3493 . . . . . . . [using light modulating elements actuated by a piezoelectric effect]
3/36 . . . . . . . using liquid crystals
3/3603 . . . . . . . [with thermally addressed liquid crystals]
3/3607 . . . . . . . [for displaying colours or for displaying grey scales with a specific pixel layout, e.g. using sub-pixels (display of colours in flat matrix panels other than liquid crystal displays G09G 3/203; grey scales specific for television H04N 3/127)]
3/3611 . . . . . . . [Control of matrices with row and column drivers]
3/3614 . . . . . . . [Control of polarity reversal in general]
3/3618 . . . . . . . [with automatic refresh of the display panel using sense/write circuits]
3/3622 . . . . . . . [using a passive matrix (G09G 3/3674 - G09G 3/3696 take precedence)]
3/3625 . . . . . . . [using active addressing]
3/3629 . . . . . . . [using liquid crystals having memory effects, e.g. ferroelectric liquid crystals]
3/363 . . . . . . . [with transmission/voltage characteristic comprising multiple loops, e.g. antiferroelectric liquid crystals]
3/3637 . . . . . . . [with intermediate tones displayed by domain size control (domain size control in flat matrix panels other than liquid crystal displays having memory effects G09G 3/207)]
3/364 . . . . . . . [with use of subpixels]
3/3644 . . . . . . . [with the matrix divided into sections]
3/3648 . . . . . . . [using an active matrix (G09G 3/367 - G09G 3/3696 take precedence)]
3/3651 . . . . . . . [using multistable liquid crystals, e.g. ferroelectric liquid crystals]
3/3655 . . . . . . . [Details of drivers for counter electrodes, e.g. common electrodes for pixel capacitors or supplementary storage capacitors]
3/3659 . . . . . . . [the addressing of the pixel involving the control of two or more scan electrodes or two or more data electrodes, e.g. pixel voltage dependent on signal of two data electrodes]
3/3662 . . . . . . . [using plasma-addressed liquid crystal displays]
3/3666 . . . . . . . [with the matrix divided into sections]
3/367 . . . . . . . [with a nonlinear element in series with the liquid crystal cell, e.g. a diode, or M.I.M. element]
3/3674 . . . . . . . [Details of drivers for scan electrodes]
3/3677 . . . . . . . [suitable for active matrices only]
3/3681 . . . . . . . [suitable for passive matrices only]
3/3685 . . . . . . . [Details of drivers for data electrodes]
3/3688 . . . . . . . [suitable for active matrices only]
3/3692 . . . . . . . [suitable for passive matrices only]
3/3696 . . . . . . . [Generation of voltages supplied to electrode drivers]
3/38 . . . . . . . using electrochromic devices
5/00 . . . . . . . Control arrangements or circuits for visual indicators common to cathode-ray tube indicators and other visual indicators (image data processing or generation, in general G06T)}
5/001 . . . . . . . [Arbitration of resources in a display system, e.g. control of access to frame buffer by video controller and/or main processor]
with a character-code memory

signals representing the characters or indicia, e.g.

using display control signals derived from coded characterised by the display of characters or indicia

Function-generator circuits, e.g. circle generators

videodisc player G09G 5/12

{ ; synchronisation )

Display of right-to-left language

Display of multiple viewports

units, e.g. other display units, video-disc players

5/02 . . . . characterised by the way in which colour is displayed { (details of colour display specific for CRTs G09G 1/28; specific for flat matrix panels other than liquid crystal displays G09G 3/2003; specific for liquid crystal displays G09G 3/3607) }

5/022 . . . { using memory planes }

5/024 . . . { using color registers, e.g. to control background, foreground, surface filling (G09G 5/06 takes precedence) }

5/026 . . . { Control of mixing and/or overlay of colours in general (G09G 5/022 and G09G 5/024 take precedence) }

5/028 . . . { Circuits for converting colour display signals into monochrome display signals }

5/04 . . . using circuits for interfacing with colour displays

5/06 . . . using colour palettes, e.g. look-up tables

5/08 . . Cursor circuits

5/10 . . Intensity circuits

5/12 . . Synchronisation between the display unit and other units, e.g. other display units, video-disc players

5/14 . . Display of multiple viewports

5/16 . . Display of right-to-left language

5/18 . . Timing circuits for raster scan displays (specially adapted for television H04N ; synchronisation between the display unit and other display units, videodisc player G09G 5/12) }

5/20 . . Function-generator circuits, e.g. circle generators [line or curve smoothing circuits]

5/22 . . characterised by the display of characters or indicia using display control signals derived from coded signals representing the characters or indicia, e.g. with a character-code memory

5/222 . . { Control of the character-code memory }

5/225 . . { comprising a loadable character generator (character generators per se G09G 5/24) }

5/227 . . { Resolution modifying circuits, e.g. variable screen formats, resolution change between memory contents and display screen }

5/24 . . Generation of individual character patterns

5/243 . . { Circuits for displaying proportional spaced characters or for kerning }

5/246 . . { of ideographic or arabic-like characters }

5/26 . . for modifying the character dimensions, e.g. double width, double height

5/28 . . for enhancement of character form, e.g. smoothing

5/30 . . Control of display attribute

5/32 . . { with means for controlling the display position (see provisionally G09G 5/42) }

5/34 . . for rolling or scrolling

5/343 . . { for systems having a character code-mapped display memory }

5/346 . . { for systems having a bit-mapped display memory }

5/36 . . characterised by the display of a graphic pattern, e.g. using an all-points-addressable [APA] memory

5/363 . . { Graphics controllers }

5/366 . . . { with conversion of CRT control signals to flat panel control signals, e.g. adapting the palette memory }

5/37 . . Details of the operation on graphic patterns (G09G 5/38 takes precedence)

5/373 . . . for modifying the size of the graphic pattern

5/377 . . . for mixing or overlaying two or more graphic patterns (G09G 5/02, G09G 5/397 take precedence)

5/38 . . with means for controlling the display position

5/39 . . Control of the bit-mapped memory

5/391 . . Resolution modifying circuits, e.g. variable screen formats

5/393 . . Arrangements for updating the contents of the bit-mapped memory

5/395 . . Arrangements specially adapted for transferring the contents of the bit-mapped memory to the screen (G09G 5/399 takes precedence)

5/397 . . . Arrangements specially adapted for transferring the contents of two or more bit-mapped memories to the screen simultaneously, e.g. for mixing or overlay (G09G 5/02 takes precedence)

WARNING

Not complete. See also G09G 5/395, G09G 5/399

5/399 . . . using two or more bit-mapped memories, the operations of which are switched in time, e.g. ping-pong buffers

5/40 . . characterised by the way in which both a pattern determined by character code and another pattern are displayed simultaneously, or either pattern is displayed selectively, e.g. with character code memory and APA, i.e. all-points-addressable, memory

5/42 . . characterised by the display of patterns using a display memory without fixed position correspondence between the display memory contents and the display position on the screen
or modulating elements, inclusive of non-linear two-terminal elements, i.e. with use of active driving circuit at pixel level for multiple image producing elements.

Sub-multiplexed active matrix panel, i.e. wherein multiple image producing elements are used for selection purposes, e.g. logical AND for partial update.

Passive matrix structure, i.e. with use of split matrices. (G09G 3/364 and G09G 3/3666 take precedence)

Active matrix structure, i.e. with use of active elements, inclusive of non-linear two terminal elements, in the pixels together with light emitting or modulating elements.

Sub-multiplexed active matrix panel, i.e. wherein one active driving circuit is used at pixel level for multiple image producing elements.

Several active elements per pixel in active matrix panels.
Details of driving circuits

related to multiple interlacing, i.e. involving more fields than just one odd field and one even field

De-interlacing

Special driving of display border areas

Field-sequential colour display

Switching ON and OFF the backlight within one frame

Scrolling of light from the illumination source over the display in combination with the scanning of the display screen

Details of the generation of driving signals

Clearing or presetting the whole screen independently of waveforms, e.g. on power-on

Precharge or discharge of column electrodes before or after applying exact column voltages

Precharge or discharge of pixel before applying new pixel voltage

Control of polarity reversal in general, other than for liquid crystal displays

with the purpose of reversing the voltage across a light emitting or modulating element within a pixel

with use of an analog or digital ramp generator in the column driver or in the pixel circuit

The addressing of the pixel, in a display other than an active matrix LCD, involving the control of two or more scan electrodes or two or more data electrodes, e.g. pixel voltage dependent on signals of two data electrodes

Details of driving circuits

Details of drivers for scan electrodes, other than drivers for liquid crystal, plasma or OLED displays

Details of drivers for data electrodes, the drivers handling digital grey scale data, e.g. use of D/A converters

Details of drivers for data electrodes, the drivers communicating data to the pixels by means of a current

Details of drivers for data electrodes, other than drivers for liquid crystal, plasma or OLED displays, not related to handling digital grey scale data or to communication of data to the pixels by means of a current

Details of driving circuits arranged to drive both scan and data electrodes

Arrangement of scan or data electrode driver circuits at the periphery of a panel not inherent to a split matrix structure

Arrangement of drivers for different directions of scanning

Details of a shift registers arranged for use in a driving circuit

Details of voltage level shifters arranged for use in a driving circuit

Details of output amplifiers or buffers arranged for use in a driving circuit

Details of sampling or holding circuits arranged for use in a driver for data electrodes

Special arrangements with multiplexing or demultiplexing of display data in the drivers for data electrodes, in a pre-processing circuitry delivering display data to said drivers or in the matrix panel, e.g. multiplexing plural data signals to one D/A converter or demultiplexing the D/A converter output to multiple columns

Partial updating of the display screen

Details of flat display driving waveforms

for resetting or blanking

Waveforms for resetting a plurality of scan lines at a time

Waveforms for resetting the whole screen at once

Waveforms comprising zero voltage phase or pause

Waveforms comprising a gently increasing or decreasing portion, e.g. ramp

Special waveforms for scanning, where no circuit details of the gate driver are given

Application of pulses of alternating polarity prior to the drive pulse in electrophoretic displays

Details of timing specific for flat panels, other than clock recovery

Control of display operating conditions

Improving the quality of display appearance

Compensation of DC component across the pixels in flat panels

Crosstalk reduction, i.e. to reduce direct or indirect influences of signals directed to a certain pixel of the displayed image on other pixels of said image, inclusive of influences affecting pixels in different frames or fields or sub-images which constitute a same image, e.g. left and right images of a stereoscopic display

with crosstalk due to leakage current of pixel switch in active matrix panels

Reducing feedthrough effects in active matrix panels, i.e. voltage changes on the scan electrode influencing the pixel voltage due to capacitive coupling

Compensation for problems related to R-C delay and attenuation in electrodes of matrix panels, e.g. in gate electrodes or on-substrate video signal electrodes

Increasing the driving margin in plasma displays

Improving the luminance or brightness uniformity across the screen

Improving the black level

Compensation of deficiencies in the appearance of colours

Flicker reduction other than flicker reduction circuits used for single beam cathode-ray tubes

Improving the response speed

Reduction of after-image effects

in the context of movement of objects on the screen or movement of the observer relative to the screen

Reduction of sub-frame artefacts

Adjustment of the gradation levels within the range of the gradation scale, e.g. by redistribution or clipping
.. for the purpose of adaptation to the characteristics of a display device, i.e. gamma correction

.. by changing the viewing angle properties, e.g. widening the viewing angle, adapting the viewing angle to the view direction

.. using tables for spatial correction of display data

.. by monitoring one or more pixels in the display panel, e.g. by monitoring a fixed reference pixel

.. by monitoring each display pixel

.. Maintaining the quality of display appearance

.. Temperature compensation

.. Preventing or counteracting the effects of ageing

.. Compensation of drifts in the characteristics of light emitting or modulating elements

.. Dealing with screen burn-in prevention or compensation of the effects thereof

.. using evaluation of the usage time

.. Adjustment of display parameters

.. Manual adjustment

.. The adjustment depending on the type of the information to be displayed

.. Adjustment of illumination source parameters

.. for control of overall brightness

.. by amplitude modulation of the brightness of the illumination source

.. by time modulation of the brightness of the illumination source

.. Modulation of illumination source brightness and image signal correlated to each other

.. Controlling or limiting the speed of brightness adjustment of the illumination source

.. for control of contrast

.. for control of colour parameters, e.g. colour temperature

.. for control of gamma adjustment, e.g. selecting another gamma curve

.. for control of viewing angle adjustment

.. with two or more screen areas displaying information with different brightness or colours

.. Calibration of display systems

.. Arrangements within a display terminal for setting, manually or automatically, display parameters of the display terminal

.. Special adaptations of display systems for operation with variable images

.. Detection of image changes, e.g. determination of an index representative of the image change

.. Determination of movement vectors or equivalent parameters within the image

.. Arrangements or methods related to booting a display

.. Generation of voltages supplied to electrode drivers in a matrix display other than LCD

.. Display protection

.. Protection against panel overheating

.. Handling electromagnetic interferences [EMI], covering emitted as well as received electromagnetic radiation

.. Fault-tolerant or redundant circuits, or circuits in which repair of defects is prepared

.. Dealing with defective pixels

.. Test circuits or failure detection circuits included in a display system, as permanent part thereof

.. Aspects of display data security

.. Arrangements for display data security

.. Aspects of architecture of display systems

.. Solving problems of bandwidth in display systems

.. Parallel handling of streams of display data

.. Aspects of interface with display user

.. Detection of the display position w.r.t. other display screens

.. Arrangements for display data security

.. Aspects of architecture of display systems
Graphics controller able to handle multiple formats, e.g. input or output formats

Display device controller operating with a plurality of display units

Use of more than one graphics processor to process data before displaying to one or more screens

Power processing, i.e. workload management for processors involved in display operations, such as CPUs or GPUs

Display system comprising arrangements, such as a coprocessor, specific for motion video images

Frame memory handling

Using a cache memory

Tiling using interleaving

Using unified memory architecture [UMA]

The frame memory having additional data ports, not inclusive of standard details of the output serial port of a VRAM

Updating a frame memory using a transfer of data from a source area to a destination area

Frame memory using a Synchronous Dynamic RAM [SDRAM]

Detecting light within display terminals, e.g. using a single or a plurality of photosensors

the light conveying information used for selecting or modulating the light emitting or modulating element

the light being detected by light detection means within each pixel

the light being ambient light

the light originating from the display screen

the originated light output being determined for each pixel

the light being detected by light detection means within each pixel

Calculation or use of calculated indices related to luminance levels in display data

Use of a frame buffer in a display terminal, inclusive of the display panel

Use of low voltage differential signaling [LVDS] for display data communication

Use of wireless transmission of display information

Use of optical transmission of display information

Details of the management of multiple sources of image data

Detection of presence or absence of input display information or of connection or disconnection of a corresponding information source

Keyboard-Video-Mouse [KVM] switch

Flexible displays

Electronic labels

Remotely controlled electronic signs other than labels

Biomedical applications

Automotive applications

Avionics applications

Electronic books and readers

Digital picture frames

Aspects of data communication

Networking aspects

Centralised management of display operation, e.g. in a server instead of locally

LAN communication management

Arrangements and methods specific for the display of internet documents

Exchange of auxiliary data, i.e. other than image data, between monitor and graphics controller

for monitor identification

using multiple communication channels, e.g. parallel and serial

using display data channel standard [DDC] communication

Consumer Electronics Control, i.e. control of another device by a display or vice versa

Details of image data interface between the display device controller and the data line driver circuit

Use of a protocol of communication by packets in interfaces along the display data pipeline

Use of DVI or HDMI protocol in interfaces along the display data pipeline

WARNING

Group G09G 2380/02 is impacted by reclassification into group G09G 3/035.

Groups G09G 2380/02 and G09G 3/035 should be considered in order to perform a complete search.

Flexible displays

Electronic labels

Remotely controlled electronic signs other than labels

Biomedical applications

Automotive applications

Avionics applications

Electronic books and readers

Digital picture frames