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CVS -700 Vision System Specifying & Ordering Guide

The CVS-700 family features extensive power and flexibility in factory-built standardized machine vision systems. Key attributes of the CVS-700 family are:

- Powered by NeuroCheck®, a world standard in Machine Vision software. NeuroCheck® combines a complete set of highest-end machine vision tools into a standardized, user-friendly package. Further information is available at www.fsivision.com.
- On both single and multi-camera systems, the cameras are located outside of the CVP (Central Vision Processor). All other functions are housed inside the CVP. This configuration offers a greater range of hardware choices when compared to one-piece, “smart-camera” systems.
- The complete unit/system is manufactured, tested, and supported at FSI’s Lombard, Illinois factory. FSI has been a trusted manufacturer of factory automation products for over 51 years. Complete turnkey or implementation services are available from our network of machine vision solution providers.

To specify or order a standard CVS-700, please make selections and insert codes sequentially into the model code, or simply circle / write in code selections on a copy of this guide. Certain popular, economical selections are marked in bold.

CVS-700 H ____ ____ ____ ____ ____ ____ ____ ____ ____ ____ ____ ____ ____ ____

- ____ ← Standard or Special
- ____ ← NeuroCheck® Version
- ____ ← Operating System
- ____ ← Processor Speed
- ____ ← Number of cameras (first digit)
- ____ ← Number of cameras (second digit)
- ____ ← Imaging Type/Requirements
- ____ ← Image Sequencing
- ____ ← Imaging Resolution
- ____ ← Grayscale or Color Camera
- ____ ← Camera Enclosure
- ____ ← CVP (Central Vision Processor) Enclosure
- ____ ← Discrete Input Type
- ____ ← Quantity of Discrete Inputs (first digit)
- ____ ← Quantity of Discrete Inputs (second digit)
- ____ ← Discrete Output Type
- ____ ← Quantity of Discrete Outputs (first digit)
- ____ ← Quantity of Discrete Outputs (second digit)
- ____ ← Additional Standard Options (add as many as desired)

Standard / Special

1 Standard. Requirements fully defined by model code and specifications in this publication. No other specifications, notes or requirements apply. This offers the most cost-effective solution simultaneously with a wide range of options

X Custom System Special requirements or user-defined details, or other non-standard or features are required. Use the model code to the maximum degree possible, and then include descriptions of all non-standard features, options or requirements.

NeuroCheck® Version

1 Run Time

2 Professional

3 Premium

Operating System

1 FSI choice

2 Windows Vista

3 Windows 7

4 Windows XP

CVP Processing Power*

1 Lowest / Slowest

2

3

4

5

6 Highest / Fastest

* This covers selection all relevant aspects of CVP processing architecture. Information on current typical configurations is available from FSI.

Number of Cameras

XX Specify 2-digit quantity of cameras, including leading zero if applicable. Examples:

01 = 1 camera 32 = 32 cameras

Imaging Type / Imaging Requirements

1 Area Scan, interlaced

2 Area scan, progressive scan (non-interlaced)

6 Line Scan

Image Sequencing

1 Not Applicable (Single camera)

2 Simultaneous image capture never required. (Program driven sequence)

3 All cameras capture image at the same time

4 Totally independent image capturing and storage capability provided for each camera.

Imaging Resolution. At least:

1 640 x 480 if area scan, 1000 if line scan

2 740 x 560 if area scan, 2000 if line scan

3 1000 x 800 if area scan, 4000 if line scan

4 1200 x 1000 if area scan, 8000 if line scan

5 1600 x 1200 if area scan

Camera: Gray/Scale or Color

1 Grayscale (monochromatic)

2 Color

Camera Enclosure Rating

1 NEMA 1

2 NEMA 12

3 NEMA 3R

4 NEMA 4

5 NEMA 4X

6 NEMA 4X primarily stainless steel

7 NEMA 7 & 9

CVP (Central Vision Processor) Enclosure

Dimensions are determined during order engineering based on the features chosen.

A **FSI FireCube™** or **FireCube Max™** style. for field setting on enclosure shelf or other horizontal surface. NEMA 1, with external connectors and switches. (see option 24 for base mounting or documented bolt pattern)

B NEMA 1 vertical / wall mount ventilated. All connectors and switches are inside of the enclosure*.

C Rack Mount. Ventilated (NEMA 1), a bracket kit (specified and sold separately) is available for wall/surface mounting. I/O and aux supplies may be separate.

F NEMA 12 wall mount ventilated*

G NEMA 4 (&12)*

H NEMA 4X (& 4 & 12)*

I NEMA 4X (& 4,12) primarily stainless steel*

* Lockable enclosure. Except when specified otherwise, all connections, switches and controls are inside of the enclosure.

Discrete Input Type

1 24 VDC std [.002 sec. (max) on time, .010 sec. (max) off time]. (Includes more noise filtering than the next choice.)

2 24 VDC high speed

3 120 VAC

4 240 VAC

Quantity of Discrete inputs

XX Specify quantity. Example: 02 = 2 inputs
Popular choices **01** through **08**

Discrete Output Type

1 Universal DC output (a "DC switch")

2 24 VDC output

3 120 VAC rated solid-state "contact" output

4 240 VAC rated solid-state "contact" output

5 Dry contact

Quantity of Discrete outputs

XX Specify quantity. Example: 02 = 2 outputs
Popular choices **01** through **08**

Additional Standard Options

(add as many as desired)

01 Ethernet Port

02 Profibus Port

03 14.5' (min) camera-to-CVP cables in lieu of 6' (min.) standard

04 25' (min) camera-to-CVP cables in lieu of 6' (min.) standard

05 30' (min) camera-to-CVP cables in lieu of 6' (min.) standard

06 75' (min) camera-to-CVP cables in lieu of 6' (min) standard

07 Two ¼" -20 mounting holes (15mm centers) on camera in lieu of STD. One ¼" -20 hole (generally applies to NEMA 1 cameras, or internally on those with higher rated enclosures)

09 Space Heater with thermostat

10 Direct hardware trigger input(s) to imaging electronics. (Bypasses software) Quantity in accordance with "Image sequencing" model code choice. Specify 1 standard input (in addition to this) per trigger if this option is chosen.

12 220v/50Hz supply rating

13 Supply surface or DIN rail mount auxiliary supplies in lieu of standard. Depending on the enclosure type, these are often provided loose…with mounting and wiring done by others during installation. 120 VAC wiring to these units is determined and done by others during installation.

14 General one-step "upsize" of the CVP (central vision processor). Spare PCI slot, extra power supply sizing & ventilation sizing. This is an economical option, the price is kept low by making these expansions not subject to any particular specifications or intended uses.

16 Separately mounted UPS (Un-interruptible Power Supply with user-selectable capability for proper automatic shutdown of the CVS-700 upon power failure.

17 All separately mounted items (if any) are internally mounted in the enclosure. (Such as UPS, aux. power supplies, I/O board)

18 Automatic boot of unit upon application of power

19 Peripheral-less shutdown kit. Closes NeuroCheck® and Windows with button press or contact closure. For systems without keyboard/mouse/monitor.

20 30 CPS frame rate imaging

21 60 CPS frame rate imaging

22 Built in Flat Panel Display (15" min)

23 CCD-only imaging

24 Add base mounting provisions, and (or) documented bolt pattern to horizontal-surface-set style CVP's such as the FireCube.

25 Terminal block type connections for all standard discrete I/O. Usually a separate unenclosed strip, FSI standard numbering, with mounting provisions and 30" minimum cable to CVP.

26 USB port with & for an at least 1 GB thumb drive.

27 Solid state hard drive

Features & Design For Standard CVS-700's

Standard construction includes the following, (Modifications are available under custom systems):

All CVS-700's are powered by NeuroCheck® software, a world-standard for machine vision software.

A complete spectrum of highest-end machine vision capabilities unified into a standardized, time-tested, and user-friendly software engine. Consult other FSI publications for information on NeuroCheck® software.

All CVS-700's manufactured and supported by FSI. FSI has a 52-year record of manufacturing and supporting products for industrial automation customers.

All CVS-700's are based on FSI making all other decisions (e.g. component selection) during the engineering phase of an order, in order to comply with the CVS-700 model code and this publication.

100 GB (or larger) hard drive or memory included

Color imaging is based on single chip design.

Discrete DC input processing speed (from signal presence at terminals to availability to the program) is application, setup and hardware dependent, but all CVS-700's support optimization to .02 second or faster. The same is true for DC output speed (from triggering by the NeuroCheck® program to switching of the output).

The CVP includes its own power supply and a U.S. std. 120 V 60 Hz power cord. For higher rated enclosures punching of the outer enclosure for wire entry is done in the field during installation. When FSI-specified cameras and I/O require separate DC supplies, low cost (120 V 60Hz input) versions are included. These are often "in line" or accessory type units, each with a standard plug. (Option 13 changes this) Design is such that it would not prevent compliance of the overall installation with the U.S. National Electrical Code (as applicable to general installations) when 120 V wiring and other required provisions (by others) are completed.

Standard units are started using the start button/switch after shutdown.

Interconnect cables to go between CVS-700 items are provided. Standard is 6' (minimum) total length; longer versions are available as options. Other field wiring provisions such conduits, hubs, holes or knockouts for hubs are not included.

Imaging array and image processing speed handling: 10 FPS capability or faster

Imaging array size is factory choice on size (within 1/3" min to 2/3" range) and type (CCD/CMOS)

Pixel clock on standard line scan units is 20 MHz

Ambient: 32 deg. to 105 deg. F, non-condensing

Aiming hardware for cameras is sold separately, or is available as part of the CVS-700 as an option.

Discrete inputs are pre-configured to go to the NeuroCheck® software.

NEMA 1 cameras include 1 ¼" -20 mounting hole, or 2 per Additional Standard Option # 07. Lighter non-NEMA 1 units may also have this mounting. Heavier non-NEMA 1 cameras may feature other heavier duty mounting provisions.

Certain options and selections may preclude the availability or usability of other options and functions. Of course, we will not propose or quote unavailable combinations of options or product choices.

FSI's terms of sale (fsinet.com/tos) apply, including those relevant to product design, documentation, certifications, packaging and included services.

On standard systems, all construction and model codes specify FSI standard construction. "FSI standard" includes FSI option to make technical decisions during the manufacturing process as long as the product still complies with the standard product specifications in this document.

CVS-700's powered by Professional or Premium NeuroCheck® include a high quality extensive set of software manuals; those powered by NeuroCheck® run-time include a basic software manual. A set of documentation for all CVS-700 hardware specific items required for installation and implementation of the application is also included. Additional copies or other documentation may be ordered as separate items / services.

Re-enclosure is supported only for enclosures very much larger than FSI's CVP, with an interior temperature within FSI's ambient specifications, and negligible electrical noise generation by other devices.

Includes a port as necessary for the NeuroCheck dongle.

Spare ports, slots etc. may help enable other functionality, uses and modifications. Review, doing and/or support for such is quoted and sold separately.

Post-Manufacture Modifications

The most important preparation for modified future uses is the choice of a CVS-700 product, (powered by NeuroCheck®) which provides power and flexibility of both NeuroCheck® and Microsoft Windows platforms. NeuroCheck® software is powerful and flexible with capabilities to handle nearly any imaginable machine vision application. Hardware is more specialized for the application. The CVS-700 architecture features greater flexibility for hardware modifications and retention of the original equipment investment, but all post-manufacture hardware additions require engineering review to determine capability and feasibility, pricing, and hard-

ware and services needed for successful expansion.

General Notes on All Systems

Any change in any of the following items may interact with or change any other of these items:

Equipment capabilities and specifications (general, and application specific)

Applicability or usability of the equipment or options for an application

The mission and conditions of the application.

Availability of features & options

Pricing and Lead Time

FSI proposals include specification and review of a particular set of the above items.

Custom Systems

Here are some examples of non-standard options that are available (only) in custom systems.

- Customer specified construction details or build-to-spec systems
- Mixture of discrete input or output types
- Multi-camera systems with non-identical cameras
- 3 chip imaging on color systems
- Higher frame rates / imaging speeds
- Higher pixel clock rates on line scan units (40 MHz, 60MHz etc.)
- Customer specified sub-vendors or components.
- Custom nameplates
- Customer-specified or special CCD array sizes
- (Formalized) Provisions for future additions
- Higher performance specs (than standard spec) in any area.
- Other input power voltages and frequencies
- Nearly any other special option, feature, or specification is available