MITSUBISHI ELECTRIC

Changes for the Better

Automating the World

M8V SERIES CONTROLS

MILL SPECIFICATIONS

Mill Specifications for M8V Series Controls

- 3-dimensional circular interpolation
- 3-dimensional tool radius compensation (tools vertical-direction compensation) (M800V only)
- Absolute/incremental command
- Alarm guidance
- Automatic backup (setup by parameter)
- Automatic support functions
  - Automatic tool length measurement
  - Cutting load control
  - Manual tool length measurement
  - Multi-step skip
  - PLC skip
  - Programmable current limitation
  - Speed change skip
  - Rotation measurement
  - Skip
  - Tool life management
    - 999 sets (M800V)/200 sets (M80V)
  - Torque limitation skip
  - Workpiece position measurement
- Axis detachment
- Built-in Wireless LAN (M800VS/M80V only)
- Circular interpolation (center/radius designation)
- Cutting feed override
- Cylindrical interpolation
- Data protection by user level
- Data protection key
- Direct Robot Control (DRC)
- Drip feed through RS232, USB, SD front side memory card, or data server SD memory card
- Editing
  - Background editing
  - Buffer correction
  - Display/edit 3 programs at once (15" and 19" screen only)
  - Editing of all memory types (memory card front slot, data server, USB)
  - G code guidance
  - Machining program input mistake check warning
  - Multi-part system simultaneous program editing
  - Program editing
- Exponential interpolation (M830V only)
- Feed per minute (asynchronous feed)
- Feed per revolution (synchronous feed)
- G00 feedrate designation
- Helical interpolation
- Hypothetical axis interpolation (M800V only)
- Inch/metric changeover
- Inclined axis control/inclined surface machining command
- Input/output I/F
  - SD card I/F
    - Control unit-side SD card I/F [up to 32GB]
    - Front-side SD card I/F [up to 32GB]
  - Ethernet I/F (using FTP software)
  - Front-side USB memory I/F [up to 32GB]
  - RS-232C I/F
- Inverse time feed
- Interface with Renishaw SPRINT system (M800VW)*
- Ladder monitor
- Machine accuracy compensation
  - Backlash compensation
  - Circular error radius compensation
  - Lost motion compensation
  - Memory-type pitch error compensation
  - Rotation center error compensation
  - Smooth high-gain (SHG) control
  - Two-way pitch error compensation
- Manual speed command (specify feedrate in running program by handwheel)
- Menu list
- NURBS interpolation (M830V only)
- OMR-CC (Optimum Machine Response - Contour Control)
- Operation history
- Override cancel
- Parameter guidance
- Parameter lock
- Polar coordinate interpolation (M830V only)
- Precise parameter adjustment screen for high-accuracy control
- Program control/test
  - 2D graphic check
  - 3D solid program check
  - Dry run
  - Machine lock
  - Machining time computation
  - Miscellaneous function lock (MST lock)
  - Optional block skip
  - Single block
- Program display lock (9000 programs)
- Program protection lock (9000 programs)
- Program support functions
  - 3-dimensional coordinate conversion
  - 8000 macro variables
  - 8 million extended variables
  - Automatic corner override
  - Coordinate rotation by program/parameter
  - Corner chamfering/corner R
  - Exact stop check mode
  - Figure rotation (M800V)
  - Fixed cycles
    - 2D Barcode and Text Engraving
  - Geometric command
  - High-speed machining mode I (G05P1) maximum [M800V-33.7kBPM/M80VA-33.7kBPM]
  - High-speed machining mode II (G05P2) maximum [M800V-168kBPM/ M80VA-101kBPM]
  - High-speed high-accuracy control I (G05.1Q1) maximum [M800V-67.5kBPM/ M80VA-33.7kBPM]
  - High-speed high-accuracy control II (G05P10000) maximum [M800V-168kBPM/ M80VA-101kBPM]
  - High-speed high-accuracy control III [M800V-168kBPM/M80VA-101kBPM]
  - Interactive cycle insertion (icon based programming)
  - Linear angle command
  - Macro interrupt
  - Machining condition selection
  - Mirror image
  - Parameter input by program (G10)
  - Playback
  - Polar coordinate command
  - Programmable in-position check
  - Rapid traverse block overlap
  - Scaling
  - Simple programming (NAVI mill conversational programming)
  - Smooth fairing
  - Subprogram control (10 layers)
  - SSS control
  - Timing synchronization between part systems
  - Tool/material shape input by program
  - Tolerance control
  - User macro
- Rapid traverse override
- Remote desktop connection (using VNC software)
- Simple screenshot capture
- Software packages
  - NC Explorer
  - NC Monitor2
  - NC Trainer2*
- Software stroke end (over travel)
- Spindle functions
  - Constant surface speed control
  - Spindle positioning (PLC dependent)
  - Spindle override
  - Spindle oscillation (M800V only)
  - Spindle orient (PLC dependent)
  - Spindle speed clamp
- Spiral/conical interpolation
- Spline interpolation (G05.1Q2/G61.2)
- Spline interpolation2 (G61.4)
- Stroke check before travel
- Support for 17 languages including English/ Spanish/French/Chinese/Japanese…
- Tapping
  - Deep-hole tapping cycle
  - High-speed synchronous tapping cycle
  - Pecking tapping cycle
  - Punch tapping
- Dwell (time-based designation)
- Program storage
  - M80V 2500 KB/M800V 4000 KB [2000 programs]
  - Data server rear slot SD Card up to 32GB (SLC memory)
  - Memory card front slot SD Card up to 32GB (SLC memory)
- Tool center point control (TCP)
- Tool cutting point control (M850V only)
- Tool compensation functions
  - 3-dimensional tool radius compensation (M800V only)
  - 400 sets or higher (dependent on CNC type)
  - Tool compensation for additional axes (other than X and Z)
  - Tool length and radius offset
  - Tool nose radius compensation (G40/41/42) (M800V only)
  - Tool position compensation (G43.7) (M800V only)
  - Tool wear offset
- Tool/work offset range function
- Touchscreen as standard
- User selectable menu configuration (rearrange the order of softkeys)
- Vertical axis pull-up
- Vibration cutting control*
- Work/tool offset change by program
- Zero return
  - 2nd, 3rd, 4th reference position return
  - Absolute position detection
  - Automatic 1st reference position return
  - Manual reference position return
  - Reference position check
- No need to purchase options to add axis

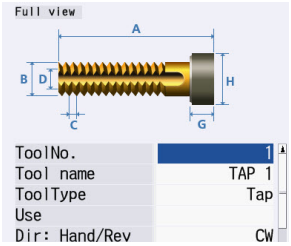
*Option to be purchased

All specifications are listed for the M8V Series controls, unless specified. These specifications do not apply to M80VB or M8 Series controls. Please contact Mitsubishi Electric for further details.

Mill Feature Explanations

Scan to watch demonstrations of these features

Tool Management



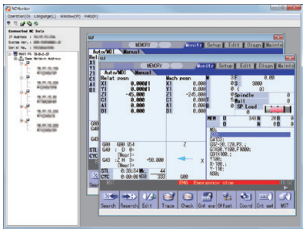
Create custom data for each tool. Displays all data for each tool in one place including tool shape, offset values, tool life data, and tool specifications. A tool icon is brought up on the monitor page during each tool change creating peace of mind for the operator indicating that the right tool data is assigned to the actual tool doing the cutting. This data is migrated over to the Navi conversation programming.

Customized Navigation

While we take pride in the setup and navigation of our control we think it's best for the operator to change the way they see things.

- Softkeys can be organized freely.
- Position displays can be organized and changed with a push of a button. Display 1, 2 or 4 position counters and customize each one freely.
- Data such as variables, tool offsets, work offsets, etc. can be viewed right on the monitor page, easily choose the one you want to see.

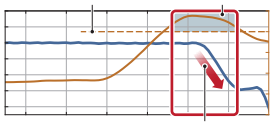
NC Monitor2

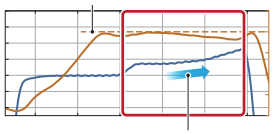


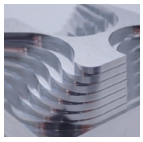
This free software allows any networked machines in a shop to be monitored from a PC in the office. Just open the software, click on the machine, and the same CNC screen can be displayed and navigated. Screen changes will not affect the machine screens, so the operator can continue their job functions. Access levels can be set by parameter to View and Change Data, View Only, or No Access.

Cutting Load Control

Federate is automatically adjusted so that the actual load rate matches the predefined target load rate during machining. The parameters appropriate for the tool and workpiece can be selected from eight parameter groups.







Built-in Wireless LAN

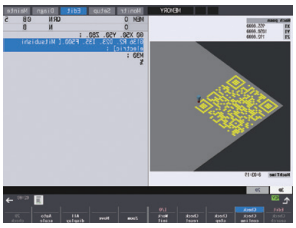
Our industry-first* NC control unit with built-in wireless LAN frees operation from the constraints of time and space. It can be connected to software tools on a PC to exchange data using wireless communication. (M800VS/M80V only).

*As of August 2021. According to research by Mitsubishi Electric Corporation.

G-Code Compatibility

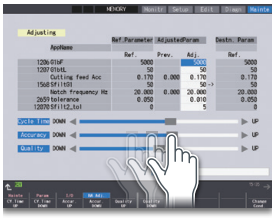
With industry standard G-code or EIA programming, there will be no need to retrain operators on a new language. All the same familiar G-codes used by the top control manufacturers are implemented. Macro programming is standard on all M8V controls and many of the variables are the same as other control builders as well.

2D Barcode and Text Engraving



A program for engraving a QR code can be created easily using a fixed cycle. A QR code engraved on a workpiece helps automation of high-mix low-volume production and traceability of workpieces.

Parameter Adjustment Screen for High-Accuracy Control



The parameters for high-accuracy control can be adjusted through intuitive operation using three machining indexes (cycle time, accuracy, quality) displayed in the guidance. Optimal machining with no experience required by operators.

NC Trainer2 Plus

This software mimics the M8V, M8 or M7 CNC controls on a PC. You can navigate the control, create programs, change tool offsets, change parameters, run programs, open up ladders, and much more. Short of running and actual machine, if it can be done on our CNC it can be done on NC Trainer2 Plus.

IMA Adapter and IMA Mobile

Mitsubishi Electric's Integrated Machine Analytics (IMA) adapter collects data from CNC controls for real-time monitoring and analysis, improving Overall Equipment Effectiveness (OEE) and ensuring a quick Return On Investment (ROI). The IMA Mobile solution brings these benefits to the palm of your hand, allowing manufacturers to monitor their machines anywhere.

MTConnect

As more and more of the industry is using enterprise systems and looking at data collection to gather data to improve efficiencies, quality, and throughput, Mitsubishi Electric is on the forefront with adopting the MTConnect standard. With software adapters for both the M8V, M8 and M7 controls end users can work with the software provider of their choice for creating their dashboard but Mitsubishi Electric will be there to supply the software adapter to collect the vital data needed to move them to the next level.

Scan to watch demonstrations of these features

Program Restart

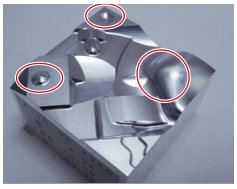
Restarting the program on an M8V CNC can be done a number of ways. The most common would be after a tool breakage. The control remembers exactly where it left off in the program. Do a simple M/S/T history and the user chooses which ones to run. This function also works great for power outages. You can also visually choose a spot in the program to start from by simply tapping the section and hitting INPUT.

User-defined Keys

Custom user-defined character generation keys are offered as standard on the M8V control. Generally used for programming, the user can define up to 8 different commonly used string of characters with a single touch of a button improving program efficiency. *Not available on all key-panels.

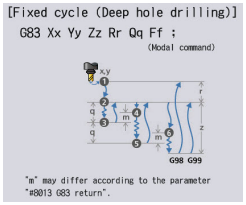
OMR-CC (Optimum Machine Response – Contour Control)

Machining is approximately 11% faster, with no loss of accuracy, compared to the existing M800 and M80 Series. This is due to control processing that adjusts to the workpiece shape to correct for programmed/actual position error.



G-Code Guidance

In the EDIT screen, we have given you a simple guide to all of the G-codes. Just type the G-code you desire and a diagram will appear, showing you the format, as well as all of the variables needed for that code. The control will also tell you if this is a Modal command.



Direct Robot Control (DRC)

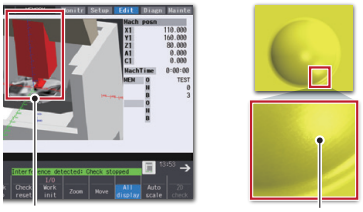
Screen guidance and special G codes allow easy programming and operation without requiring knowledge of robot language. For example, you can run a NC program that coordinates loading/unloading of workpieces by the robot with the machining of workpieces by the machine tool.

Navi Mill

Mitsubishi Electric's conversational program can make it easier for end users that are not used to G-code programming to create simple programs for machining. With cycles for facing, contouring, pocketing, drilling, pecking, step drilling, boring, tapping, and helix, as well as adding in EIA code (G-code). Easy to follow diagrams are provided for each cycle, so complex parts can be machined with ease. Easy one time setup for tools and different materials make switching between jobs effortless.

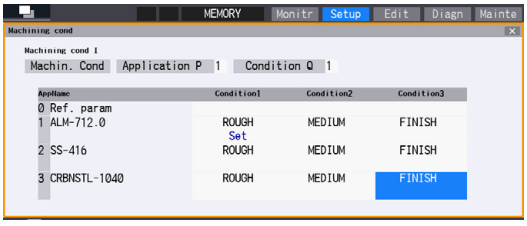
3D Graphics

2D and 3D graphics are standard on all M8V controls. With today's machines producing complex parts, it's important to verify the tool path is correct, finding errors before they happen and saving customers valuable time. With the addition of the touch screen, the operation becomes even easier on the M8V. Intuitive functions such as pinch to zoom in and out, drag with a single finger, and rotate with two fingers.



Machining Conditions Selection

This feature gives the end user complete control over the most common parameters related to high-accuracy control and can be configured in advance for each machining application. Up to 9 different conditions can be set. Each condition is activated on the fly within a program by a simple G-code. As an example, set up stainless steel for rough cutting, medium fine cutting, and fine cutting.



NC Explorer

This free software allows access to the memory on any networked machine. Attached to Windows® Explorer, this software will allow you to drag and drop files to the machine memory or SD memory cards, just as you would do any other file inside of Windows Explorer.

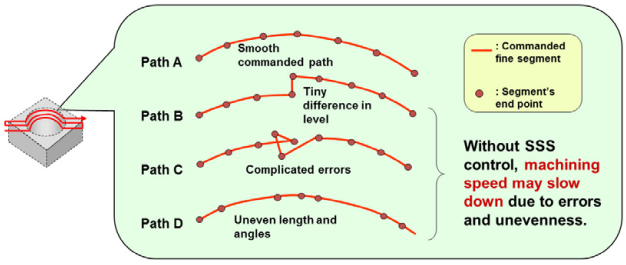
Guidance Function

While all manuals can be downloaded for free from Mitsubishi Electric, it's not always easy to find the information you need without doing timely research. Not to worry, as the M8V control has much of the same information on board. While searching through the parameter data, just press the help menu button (?) and a complete description is made available right there on the screen. The same function exists for Mitsubishi Electric generated alarms.

Scan to watch demonstrations of these features

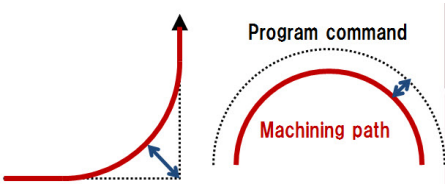
SSS (Super Smooth Surface)

With CAM software being the industry standard for creating programs for complex parts, SSS solves the problem of creating a smooth path from programs that create small straight line segments. Not only does SSS create a better finish by blending the straight lines into smooth lines and curves, but it also reduces cycle time by up to 10% to 20% by reducing unneeded accelerations and decelerations. Standard on all M8V controls.



Tolerance Control

Activated within a program or by parameter, this function allows the user to select the deviation amount with a simple parameter change. Set a large value during roughing to reduce the cycle time and set a smaller value during finish to get a more accurate cut. Standard on all M8V controls.

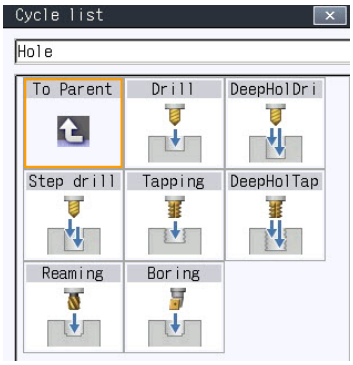


USB Running

Programs can be run from the USB slot on the front of the control the SD card front slot, and rear slot SD card (data server). Sub program calls can be made from any device to another device. Programs can be edited and created on all devices as well. No performance lag will result from running from SD or USB memory. Standard on all M8V controls.

Interactive Cycle Insertion

This icon based programming method lets you choose and customize the cycles or features you want to add to your G-code program. Both turning and milling features are included to suit traditional mill features.



Automation Needs

The M8V control offers connectivity devices for CC-Link® (Master/Slave), PROFIBUS®-DP (Master), and EtherNet/IP™ (Scanner) for all of your automation needs. Mitsubishi Electric also offers a wide variety of automation products including Robots, PLCs, HMIs, general purpose Servos, and VFDs to meet your factory automation needs.

SD Card and Data Server

Don't pay for costly memory upgrades. The M8V control uses the latest technology SD Memory cards. No need to obtain these cards from Mitsubishi Electric for hundreds or even thousands
of dollars. A simple off the shelf SD card can be purchased from your local electronics store. Two slots are available, one in the front and one in the back of the CNC. Standard on all M8V controls.

Intuitive Touch Operation (Multi-Touch)

Multi-touch gestures enable smarter operations, such as: Pinch-in/pinch-out in program display area to change text size, drag/flick to open menu list, and grab movement to open recent selected screens.

High Speed – High Accuracy Mode G05 P20000

Containing the fastest processor in the industry, the M8V Series control aids the industry leading cycle times. This function is essential for processing large CAM programs as the control must process the point-to-point movement efficiently to generate a smooth surface finish without tool hesitation.

Control	Blocks/min	Look ahead	Block processing time
M80VA	202,000	2,020	0.27 ms
M800V	540,000	5,400	0.1 ms

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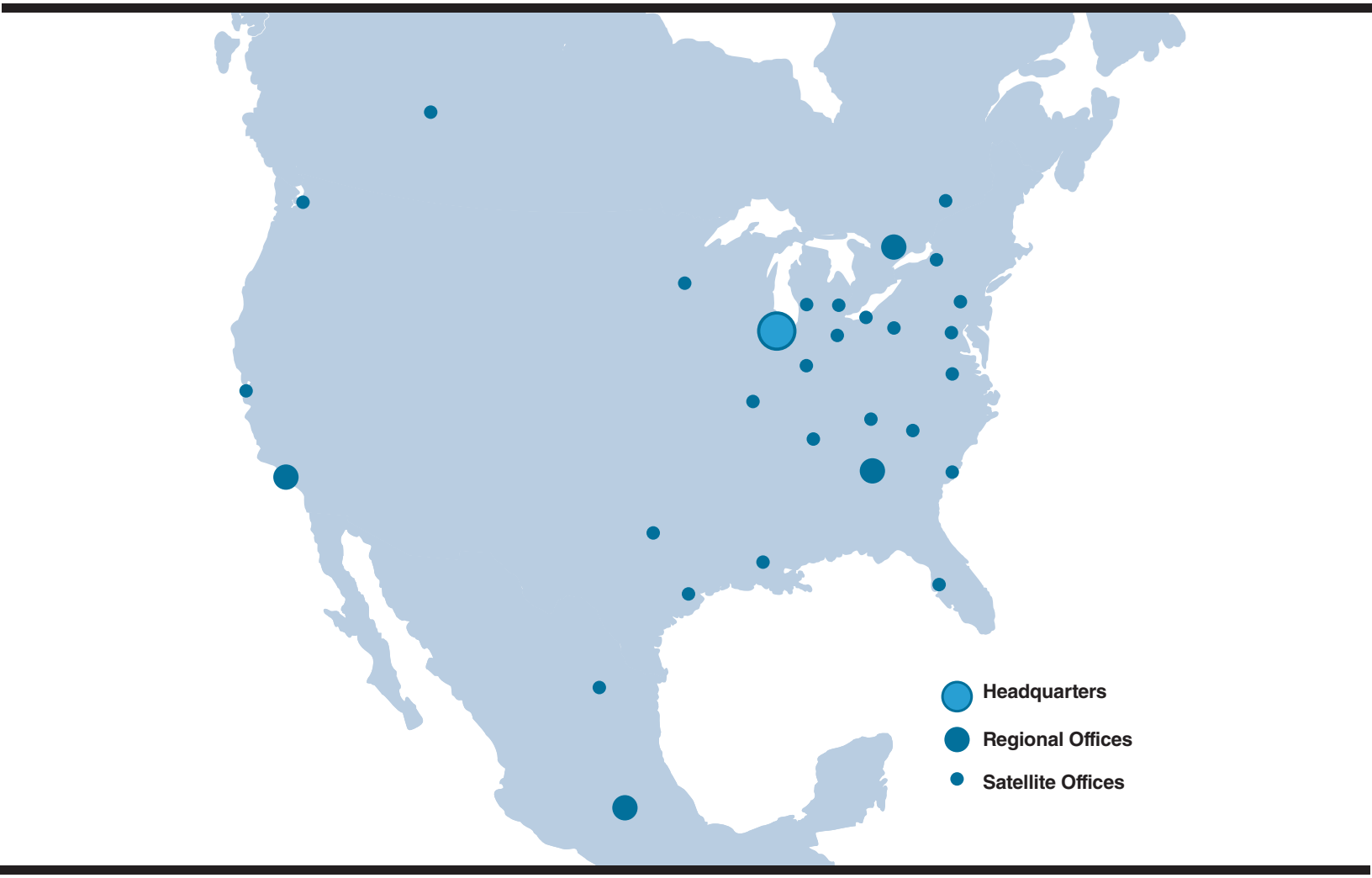

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