MITSUBISHI ELECTRIC
Changes for the Better

for a greener tomorrow eco Changes

FA用語解説集

Glossary of FA

英語

English

FA に関連する用語 750 語以上について収録しております。

We have included more than 750 terms related to FA (Factory Automation).

注意事項

Notes

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用語 （Term）	解説 （Description）
2 position ON/OFF Control	This is a method that outputs 2 steps of manipulated variable MV signals for deviation to control the system.
2-core optical connector	●A connector comprising a pair of optical fiber cables. ●Often one of the two fiber cables is used for transmission, and the other one is used for reception.
2-degree-of-freedom advanced PID control tag FB	2-degree-of-freedom advanced PID control tag FB (M_2PIDH_) is an advanced tag FB by adding functions such as: MV compensation, PV compensation, temperature/pressure correction, tag stop, PV tracking, preset MV, MV rate-of-change limiter, and cascade direct to 2-degree-of-freedom PID control tag FB (M_2PID). From simple controls to advanced controls such as variable gain PID control, compensation operations, correction operation, and feedforward control, this tag FB can be used in a wide range of controls. The following table shows the main internal funcitons.
2-degree-of-freedom PID Control	2-degree-of-freedom PID control is a control method which can optimize PID constants for both disturbance response and target tracking as compare to the former PID control. 2-degree-of freedom parameters, α and β, are used for this control. (When both α and β are 0, the control is the same as the former PID control.) * In conventional PID control, the optimum PID constants that correspond to SV change for target tracking and disturbance response differ. This causes an antinomy such as when the optimum value is set for one side, the value of the other side is not optimum.
3 position ON/OFF Control	This is a control method that outputs 3 steps of manipulated variable MV signals for deviation to control the system.
a designated bit number	Word devices enable the use of a designated bit number 1/0 as bit data by the designation of that bit number.
A/D converter module	●A device that converts analog amounts to digital amounts. ●Since analog amounts such as temperature, pressure, speed, voltage, and current cannot be input to programmable controllers as they are, they are changed to digital amounts (numerical values) so that the program can perform operations on them. ●Also called an A/D converter.
ABC analysis	ABC analysis is also called "priority analysis," and is a method of classifying inventory items. The purpose of this is to classify inventory items into three groups in order of highest sales, A control items (priority control items), B control items (general items) and C control items (low-priced items) so that priority can be efficiently managed. Reasons for this ABC analysis being used often include the fact that its effect can be soon expected, it can be used easily by anyone, it can be put to use in a wide range of fields, and results can be easily expressed in the form of graphs, etc.
Absolute encoder	●A detector that enables output of angle data within 1 motor turn to an external device. Typically, encoders are capable of extracting 360 degrees as 8192 to 262144 bits. ●Incremental encoders have a drawback in that the axis position becomes unknown when a power interruption occurs, whereas absolute encoders do not lose this position even if this happens.
Absolute position detection system	●A system in positioning where the machine's position is stored to memory on the positioning module or servo amplifier and is held as the current position even if the power is turned OFF once the origin has been set when the machine is started up. ●A zero return after the power is turned back ON is not required since any mechanical deviation is compensated for. ●To configure this system, a servo motor with absolute position detector and a servo amplifier and positioning module compatible with an absolute position detection system are required.
Absolute pressure	The amount of pressure measured by full (absolute) vacuum as standard. When indicating as absolute pressure, add abs after engineering units. Example: 5kg/cm²abs
Absolute system	●One way of expressing the positioning address. ●By the absolute address method, a position is expressed as the distance from a 0 reference point. ●The positioning direction need not be specified and is automatically determined. ●In contrast, there is the increment system.
Acceleration time	●On a programmable controller positioning module, the time until full speed is reached from a stopped state. ●Since the acceleration time in parameters refers to the time until the speed limit value is reached, the acceleration time shortens proportionately if the set speed is low. ●This is determined according to the machine inertia, motor torque, resistance torque of the load, and other factors.

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用語 （Term）	解説 （Description）
Access cycle	●The meaning of this for a programmable controller is narrow. It refers to the number of scans that peripheral devices or special function modules read and write data from and to the programmable controller CPU. ●The access cycle is 1 scan time.
Access slave station	●A slave station that can be connected by the multidrop link function of the multidrop link module. ●Up to 8 stations can be specified as access slave stations, and the order of data transfer from these stations also can be set.
Account	Designates the right to use the MES interface module or server computer, or an ID necessary for their use.
Accumulated error pulse	●Because machines have inertia (GD2), machines have a delay and cannot track when the speed command is output from a positioning module as it is. This is why a method of accumulating the speed command pulses in the error counter to provide a delay is adopted in the case of servo motors. This term refers to those accumulated pulses. ●When operation stops, the content of the error counter is completely purged to become 0. ●To be more exact, the difference between the feed pulse and the feedback pulse is the accumulated error pulse.
Accumulator	●A type of data register. Ordinarily, the programmer need not be aware of accumulators since they are used preferentially by the programmable controller CPU. However, the programmer must be aware of them with some specific commands. ●When there are 2 accumulators, A0 and A1, and the programmed data is 16 bits, the data is input to accumulator A0. When the programmed data is 32 bits, the lower word and upper word are input to accumulators A0 and A1, respectively. ●When commands that use accumulators are executed any number of times in a program, accumulators will be rewritten preferentially by the programmable controller CPU unless the data in those accumulators is transferred successively to data registers. So, attention must be paid to overwriting of accumulators when executing the next command in a program.
a-contact	●A contact that is normally open (N.O.) and that closes when actuated. ●Operation of a contacts is the opposite of that of b-contacts.
Acoustic coupler	●A device that converts digital information to sound. It is used to send information using a telephone. ●Programs and data can be communicated over a telephone line. ●The telephone's handset can be used by converting digital binary 0 (OFF) and 1 (ON) signals to an audible frequency of 1,000 to 3,000 Hz. ●The receiving side has a function for restoring sound to the original 0 and 1 signals. ●An acoustic coupler allows information to be sent more easily than a modem.
Action	Unit for processing defined in a job There are [Communication action] for communicating with a database and [Operation action] for operating tag component values. [Communication action] is a processing unit for sending one SQL text (Select, Update, Insert, MultiSelect, or Delete). [Operation action] is a processing unit of up to 20 dyadic operations.
Actual current value	The number of pulses of actual servo travel amount calculated from the feedback pulses.
Addon	The meaning of this for a programmable controller is narrow. It refers to the mode of directly connecting to a module by a connector without the assistance of a cable when connecting peripheral devices to a CPU module.
Address	●Address in memory. Memories have addresses, and data is written to and read from designated addresses. ●A numerical value for indicating a target position during positioning. The unit is set in mm, inches, angle (degrees), or number of pulses.
ADSL (Asymmetric Digital Subscriber Line)	Asymmetric digital subscriber line. A high-speed data communications technology used on copper wire telephone subscriber lines.
AFTER mode(after mode)	This is the mode that outputs the M code after positioning is complete (after stopping). Clamping can be commanded, drilling dimensions can be selected, etc., with this mode.
Alarm level	The levels of alarm item importance of tag alarm. The levels are major alarm, minor alarm.
Alarm status	Indicates the alarm occurrence status of tag alarm such as high high limit alarm (HH), high limit alarm (H), low limit alarm (L), low low limit alarm (LL).

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用語 (Term)	解説 (Description)
Algorithm	Processing procedures for achieving a specific aim on a computer. An algorithm actually described in programming language is called a "program."
Analog	●An amount that changes continuously. For example, time, temperature, pressure, voltage, current, and flow rate are analog values said to be difficult to handle as numbers (digital values). ●Since analog values cannot be handled directly by a programmable controller CPU, they are converted to digital values for subsequent arithmetic processing. This is called A/D conversion.
Analog conversion enable/disable setting	This function sets whether A/D or D/A conversion for each channel is enabled or disabled. Setting the channels not to be used to be disabled decreases sampling periods.
Analog output HOLD/CLEAR function	This function retains an output analog value for the case where the CPU module is placed in STOP or in a stop error status.
Analog RGB	●A type of video signal system that expresses color signals by brightness information and the ON/OFF state of signals for the three primary colors red (R), green (G) and blue (B). ●Since analog systems can express color contrast based on the three primary colors, many colors of 16 colors and more can be displayed.
Analog speed command	Command for smoothly controlling the direction and speed of rotation of a servo motor at high precision by an analog voltage from an external device.
AND operation	When expressed in a sequence circuit, series contacts.
Andon	An information transmission device for notifying the person in charge of any abnormalities occurring on a production line.
Announce function	●A function of the graphic operation terminal (GOT). ●This function displays or prints out a pre-defined user message or error warning message with date/time appended when a specified bit device turns ON.
Annunciator	●A handy internal relay for use in programs for detecting abnormalities and malfunctions. ●Malfunction number, expressed as relay F on MELSEC. ●This is different from other relays in that when relay F turns ON, its number is stored to a special register. It is also reset by the reset command RST.
ANSI standards	●A private standards association intended for the unification and standardization of standards in the United States ●Standards established by the American National Standards Institute ●This is equivalent to JIS in Japan.
Application	Software that has been designed for a specific purpose, such as creation of documents and calculation of numerical values. This is an abbreviated term for "application software." It is also often shortened to "app." All applications contain features required by users and are used on OSs (operating system) that group together basic common functions. Typical applications include word processing software and spreadsheet software, image editing software, database software, presentation software, web browsers, and e-mail software. Financial accounting, human resources management software and inventory management software, for example, used in companies are types of application software.
ASCII code	●American Standard Code for Information Interchange (ASCII code) ●Code that expresses symbols, alphabet characters, numbers, and other information as hexadecimal 2 digits (7 bits) for input to a computer. ●A is 41, B is 42, 1 is 31, 2 is 32, and so forth. ●Japan also has JIS code comprising ANSI code added with "kana."
ASP (Application Service Provider)	A vendor who provides applications over the Internet for use by clients.
Assignment	The task of assigning programmable controller input modules, output modules and special function modules to slots on the base module.
Auto logging	A function to automatically start logging when a CompactFlash card with the auto logging settings written to it in advance is inserted in a running high speed data logger module.
AUTO mode	The mode controlled by setting value (SV) set on the HMI screen.
Auto refresh setting	Buffer memory to be auto-refreshed is set. Buffer memory with the auto refresh setting is automatically read and written to the specified device when the END instruction for the CPU module is executed.

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Auto tuning	Method that detects dynamic characteristics by moving the plant and automatically obtains proportional gain (Kp), integral time (Ti), and derivative time (Td) of PID. Auto tuning can be performed with step response method for QnPHCPU, QnPRHCPU.
Automatic reconnection	After an abnormality occurs on a local station or remote I/0 station on a data link and the station is disconnected (e.g. loopback state), it is automatically reconnected to the data link when the abnormality is recovered and the state is returned to normal.
Auto-tuning (servo)	●On a servo, this refers to a function for estimating machine characteristics (load inertia moment) in real time, and automatically setting the optimum gain for that value.
Averaging processing	The digital output value is averaged on a channel basis and the averaged value is stored in buffer memory. The averaging processing has some methods as follows: (a) Time average (b) Count average (c) Moving average
Backlash compensation	In meshing of gears, play (backlash) sometimes occurs when gears rotate in reverse from a forward rotating state. The same thing happens with screws. In positioning, feeding a screw CW 1 m and then feeding it CCW 1 m will be insufficient to return the screw to its original position. The gear will not return to its original position unless it is feed extra by the amount of backlash. This is called "backlash compensation."
Balancing	The averaging of the production volume of individual products. For example, when there is fluctuation in the order volume which also results in fluctuation in the production volume, even if that fluctuation range is still within the production capacity, it is desirable to level and average, i.e. balance, the production volume. Balancing ensures the smooth procurement of parts and operation of the production line.
BASIC	●Beginner's All-purpose Symbolic Instruction Code (Basic) ●Computer programming language created in the United States. ●Its features are that it is easy to understand, as shown by its wide use on computers and that it allows computer operation to be intervened midway. ●For that reason alone, it has been extremely expanded and comes in many types. (○-BASIC is a dialect.)
Batch	Amount that is processed in a single operation in processes (i.e. batch processes) that cannot be stopped midway once materials have been supplied, such as annealing and polymerization.
Batch process control	A type of control which produces various products with the same equipment or devices. It has processes of Polymerization, mixture. Complicating controls such as switching recipes for each kind of products, selecting processes, CIP are required. Recently, the batch process control type is increased. In addition, production operation in the batch production process (batch recipe registration, batch reservation, execution recipe expansion, batch progress management, batch sequence execution management, device monitoring, and performance collection) are called batch management. One of standards in batch management is ISA SP88 model. A type of control which produces the same products with the same equipment or devices is called continuous process control.
Battery backup	The content of IC-RAM disappears when a power interruption occurs. Battery backup refers to retaining this memory content by means of a battery to prevent loss of data.
Baud rate	●A unit expressing communications speed. The number of bits that is transmitted in 1 second is called baud (BPS) which is normally referred to as the baud rate. ●Strictly speaking, however, modulation speed is called "baud" and differs from the number of bits. ●In other words, when information of 1 bit or more is placed on 1 carrier wave, the number will not be the same. ●For example, assuming that 2 bits are placed on 1 carrier wave, the baud rate becomes 1/2 of the bits.
BCD code	●Binary Coded Decimal (Binary-coded decimal) ●Computers, programmable controllers and other devices operate by binary numbers for ON (1) and OFF(0) states, for example. Since this is difficult to understand to man, decimal numbers are expressed as binary numbers. ●BCD code is often used in the digital switches and digital indicators handled by man. ●In 16 bits, the range 0 to 9,999 can be handled, and in 32 bits 0 to 99,999,999 can be handled.

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用語 （Term）	解説 （Description）
b-contact	●A contact that is normally closed and that opens when actuated. ●Operation of b-contacts is the opposite of that of a-contacts. ●They are also called NC contacts or back contacts.
Between-the-lines statement	Explanatory text (statement) inserted between circuit blocks in a sequence program.
Binary	●A number comprising binary digits.
Binary file	A file format where data are saved in a format which a computer program can directly interpret (a format other than text).
Bit	1A bit is the minimum unit of information for expressing two states, 0 (OFF) and 1 (ON). Contacts and coils are 1 bit, and so are called bit devices.
Bit pattern	The arrangement of a bits 1 and 0 states.
Block switching method	In the block switching method, specify the number of used file register points in units of 32k points (one block). For file registers of 32k points or more, specify the file registers by switching the block No. to be used with the RSET instruction. Specify each block as R0 to R32767.
BOM (Bill Of Materials)	This refers to a parts list , parts composition list or parts expansion list. The BOM attempts to manage all parts (easier to understand if products also are included) used within a company as a single database and not within the limits of the production management system.
Bottleneck	A TOC term. Generally, this refers to the slowest part within an entire production system. If we look at the production line for a single product, there are efficient and inefficient processes. In TOC, inefficient processes are called bottleneck processes. The production efficiency of bottleneck processes defines overall production efficiency. That is, however good the production efficiency of non-bottleneck processes is, overall production efficiency cannot exceed the efficiency of bottleneck processes. TOC executes schedule centering around bottleneck from the standpoint of this approach.
BPR (Business Process Reengineering)	Setting of targets (sales, profitability, etc.) relating to business activities, and the analysis and optimization of business content, business flow and organizational structure to attain those targets.
bps (Bits Per Second)	A unit of data transfer speed on communications lines, for example. Bits per second. 1 bps means that 1 bit of data can be transferred in 1 second.
Braking	This refers to stopping motor rotation during operation.
Bridge	●A device for connecting networks with differing protocols. Though a bridge functions in the same way as a gateway, a bridge is more suited to connecting between relatively similar networks.
Broadband	A multiplex transmission system where a frequency band is divided by a predetermined bandwidth and different information is placed respectively on divided channels on a single transmission path.
Broken line correction	It is used when the value from the process target is not in proportion to process variable from the sensor. Input value is approximated and corrected by broken line. Process FB P_FG is applied to the broken line correction.
BSC protocol	●Binary Synchronous Communications ●A basic data transfer protocol. ●It is stipulated in JIS X 5002. ●A protocol for communicating data between two computers or between a computer and a programmable controller. ●The RS-232C interface can be used on the hardware. ●There are two control modes, contention and polling.
BTO (Built To Order)	A system of assembling, manufacturing and selling based on an order from the customer. A system of manufacturing and selling personal computers. "Built To Order" simply means "manufacturing (building) after receiving an order."
Buffer memory	The memory of intelligent function module or network module used to store data for communication with a CPU module.
Building block type	●A method where required element parts are combined to configure a single system. ●With MELSEC, the power supply module, CPU module, I/O module, special function module, base and other modules can be selected to build a system.

用語 （Term）	解説 （Description）
Bumpless	At the time of AUTO　MANUAL mode switching, this function prevents step changes caused by sharp change of manipulated variable (MV) output, and ensures MV to be converted smoothly and bumplessly.
Burnout	When converter input is in the non-input mode caused by such as sensor disconnection, follow through upper or lower limit of converter output signal. Example: For thermocouple, becomes to maximum value of thermocouple converter output to prevent overheating in burnout,.
Bus	●With programmable controllers, this is used as the main street on which to communicate data (ON/OFF information) between the CPU and modules.
Bus error	●This refers to a state where the common track (bus) for sending data between a programmable controller CPU and modules has become abnormal.
Byte	A unit of amount of information. A byte is the equivalent to 8 bits.
C++ language	This programming language came into being by adding object oriented enhancements to C, the widely popular programming language. C is upwardly compatible with the language specifications of C++, and the processing system of C++ can also be used to develop software originally programmed in C. Object oriented programming enables programs to be recycled and large-scale, complex software to be developed more easily.
CAD/CAM	●CAD is a computer-based design support system. ●Computer Aided Design. ●Computer Aided Manufacturing. CAM is a computer-based factory production support system, and is viewed as an extension of CAD. In a CAM system, shape data created on a CAD system is used as the input data and overall manufacturing preparations such as creation of the NC program for machining are performed on a computer. ●Computers used in a CAM system range from regular personal computers through to engineering workstations. ●CAD information: In addition to fabrication drawings, parts lists, price estimates, approval drawings, etc., sequence programs also can be created. ●CAM information: In addition to CAD information, parts purchasing tickets, production process schedules, job tickets, test specifications, packing procurement forms, dispatch forms, etc.
CAE (Computer Aided Engineering)	A computer system for aiding the design/development processes of industrial products. In actual terms, this includes product design support systems, analysis systems that use designed product models to calculate properties such as strength and heat resistance, and simulation systems for checking product functions and performance.
Capacitor backup	●This refers to the retention of IC-RAM content by a capacitor to prevent it from being lost when power is turned OFF. ●The retention capacity of the capacitor at a power interruption is short-term, and its main purpose is to retain memory content at battery replacement.
Carrier band	A method where data signals on a single channel are encoded on the transmission path and sent on the carrier wave (sine wave or cyclic pulse signal that is sent with information on it).
Carry flag	A relay that turns ON under specific conditions.
Cascade control	Cascade control is composed of double loop of primary loop and secondary loop. It is the control that removes the effect on the process and improves the whole control performance by checking out disturbance entering secondary loop in an early stage as well as absorbing them into secondary loop. Generally, the response of secondary loop is desirable to be over 3 times faster than primary loop.
CASCADE mode	This is the mode for cas used when regarding setting value (SV) as primary indicated value such as interlock operation with other loops and the case of combination with Program setter.
Cash flow	This refers to the flow of cash that remains after deducting payments outside from income actually gained through corporate activities. The outflow of cash is called "cash outflow" and the inflow of cash is called "cash inflow," and both combined is called "cash flow."
CCW (Counterclockwise)	Rotation in the counterclockwise direction. In the motor, this is determined looking from the shaft end side. Also refer to "CW".
Cellular manufacturing	A production process where a series of part groups are manufactured. Work is performed in relatively narrow space by reworking the layout of the machines. This increases work efficiency and reduces stock.

C

用語 （Term）	解説 （Description）
Centronics interface	●A transmission system originated by Centronics Data Computer Corp. of the United States. ●Parallel transmission is used for one-way transfer in transmission only (e.g. printers), and 8 leads + several electrical leads are used. ●The Centronics interface is susceptible to noise, making it ideal for short distances.
CHANGE signal (change signal)	The CHANGE signal is an external signal used to switch the speed-position control from the speed control being executed to position control.
Character generator	●Characters, symbols, etc. stored to memory as an aggregation of points (bits). ●Many characters are committed to memory in ROM, and to display characters, they are called from that memory. ●This is also called "font memory."
Cheapernet	●This name derives from the fact that it uses co-axial cable that is thinner and cheaper than Ethernet co-axial cable. It is also called Thinwire Ethernet. ●At 10 Mbps, the transmission speed is the same as that of Ethernet. ●This cheap version of Ethernet does not require any special additional devices and uses T-connectors for connecting terminals instead of transceivers. Its maximum segment length is 185 m, and up to 30 terminals can be connected.
Checksum	A function for detecting when data has changed midway during transmission (i.e. error detection).
CIM (Computer Integrated Manufacturing)	This system uses a computer network and database to control and manage all manufacturing-related information in an integrated manner in order to optimize manufacturing activities.
Circuit breaker	A switch that automatically cuts off abnormal current to prevent the burning of electrical wiring and various devices.
Circuit protector	A switch for protecting electrical wiring from burning caused by short-circuiting, etc.
Circular interpolation	●Arithmetic operation executed by the CPU to perform automatic operation as if to draw a circle when 2 motors, one each for horizontal and vertical direction feed, are operated simultaneously to execute positioning. ●Normally, interpolation is performed in 90° units. ●Circles can be made and obstructions midway can be avoided.
Clamp diode	●A diode that is provided for clamping the voltage to a fixed level or fixed direction. ●Surge killer for DC.
CMI mode	●Coded Mark Inversion. ●With this modulation system, 1 bit of data is further divided into 2 bits, and then transmitted according to the following rules: ●When the bit is 1: 2 bits are treated as 1, 1 or 0, 0. As a condition, 1, 1 and 0, 0 are repeated alternately. ●When the bit is 0: 2 bits are treated as 1, 0. (Bit combination 0, 1 does not exist.) ●This mode is used on MELSECNET.
CMOS	●Complementary Metal Oxide Semiconductor transistor ●Digital logic elements. ●These elements are connected on programmable controllers as well as TTL elements. ●Their features include compact size, low power consumption, wide operating voltage range, and wide operating temperature range. ●Handling precautions are the same as those for TLL.
CMV（COMPUTER MV）	Abbreviation for COMPUTER MV. One of control modes and changes MV from upper computer.
Co-axial cable	●An electrical lead comprising one lead wire covered with some kind of insulation and a shield covering this that allows the efficient conveyance of high frequencies. It is used for TV antennas. ●Distances that signals can be sent by co-axial cable are shorter than optical fiber cable. ●It is cheap. ●It is stipulated in JIS C 3501.
Cold junction compensation	A compensation function for thermocouple input module to reduce a measurement error caused by changes in ambient temperature of the criterial terminal. For temperature measurement using a thermocouple module, the ambient temperature of the criterial terminal needs to be maintained at 0° C. However, it is difficult to maintain at 0°C in reality. This function reduces measurement errors by adding a thermal EMF equivalent to the ambient temperature to the internal amplifier

C

用語 （Term）	解説 （Description）
Cold start	A system which outputs from the reset values not the previous values when restart after a power failure of control system. On the other hand, a system which outputs from the previous values is called hot start. Hot start
COMMIT	Processing for finalizing the changes to a database
Common	●Common line. ●16 points 1 common refers to 16 inputs or outputs connected to 1 common line, and the power supply used must be the same.
Common mode noise	Noise that is generated between a signal lead and ground or a panel. For example, common mode noise includes noise (electromagnetic induction, electrostatic induction) radio waves that are induced from other electrical leads, and grounding is effective in preventing and reducing noise.
Communication speed	Speed at which data is sent and received. The unit is expressed as BPS (Bit Per Second or bit/second), and indicates how many bits of data are sent per 1 second. A "bit" is the smallest unit of a binary number (ON, OFF) comprising 1 character. For example, in the case of 800 BPS, 800 bits are sent in 1 second.
CompactFlash card	A storage card regulated by the 'CF+ and CompactFlash Specification' issued by the CompactFlash Association. The memory card required for operating the high speed data logger module.
Composite video signal	●A single video signal that groups together the synchronization signal, brightness signal and color signals. ●A screen corresponding to color gradations is displayed even if this signal is input to a black-and-white CRT. ●Generally, connection by a single co-axial cable is sufficient. However, clear images cannot be sent since the frequency band of video is limited by the color carrier wave.
Concurrent Engineering (CE)	This refers to optimization of the overall lifecycle in production by concurrently advancing all processes from the stage for determining the product development concept through to commodity design, test evaluation, production preparations, and production/shipping. Expected results include reduced development period, effective utilization of development resources and cost reductions.
Constant Scan	Scan time differs depending on the execution status of instructions used in sequence programs. This function repeatedly executes sequence programs keeping their scan time constant. ・Application I/O refresh is performed before every sequence program execution. This function is used to maintain I/O refresh intervals constant even if the execution time of each sequence program differs. • Scan time without constant scan setting
Contact output	A type of connection where a miniature relay is held internally for programmable controller output and one of its dry contacts can be connected to the outside.
Control cycle	A cycle of control activity. With continuous control function block, activity such as input processing starts every execution cycle, however, PID control operation starts every control cycle. (Control cycle should be set to be the integral number multiple of execution cycle.) Instructions which can be set a control cycle are PID, BPI, IPD, 0NF2, ONF3, R, 2PID. (Reference) Selection example of control cycle (CT) In PID control, when Integral time is relatively big (long), bigger (longer) the control cycle (CT) improves the control performance.
Control mode	A switch which changes the control mode such as MANUAL (MANUAL, MAN, M), AUTO (AUTO, AUT, A), CASCADE (CASCADE, CAS, C). Normally, a switch from CAS to MAN, and MAN to CAS are via AUTO. In stop alarm, it switches from CAS to MAN automatically. There is the operation mode as well.
Control station	●The station that controls the entire network in MELSECNET/10, H and CC-Link IE controllers. Only 1 station exists on 1 network. ●In the event that a control station becomes abnormal, one of the normal stations takes the place of the control station to become the sub-control station, and the data link can be continued.
Control station switching time	Time taken from when the control station went down due to a reason such as power-off until data link is started by the sub-control station.

C

用語 (Term)	解説 (Description)
Control system /Standby system	The basic system that is controlling the redundant system and performing network communication/ The basic system for backup that consists of the redundant system
Control valve	By operation signal from a controller of automatic control, operates valve body with auxiliary power such as pneumatics, oil hydraulics, electricity, and controls the variables to the specified ones. Composed of actuator and valve body.
Core, cladding	●The optical fiber of an optical fiber cable is made of a core and cladding. ●The core is the central part of the cable along which light is conveyed and has a high diffraction index. It is about the thickness of a single strand of hair. ●The cladding is the part that covers the outside of the core and functions to lock in light, so it has a low diffraction index. ●Due to differences in the diffraction index of the core and cladding, there are two indices, SI (step index) and GI (graded index), and quartz, multicomponent glass and plastic materials are used.
Count type zero return	●One of three zero return methods in positioning control. ●With this method, deceleration starts during zero return operation by the proximity dog turning ON, and after having moved by the "preset travel after proximity dog ON" setting at the creep speed, the initial zero point signal position is taken to be the origin address.
Coupling noise	●Noise that a device is subjected to when 1 ground is shared by many devices. ●When current flows to ground from a device, it invades other devices that share the ground as noise. ●Connecting the machine body and controllers to separate grounds is recommended to prevent devices from being subjected to coupling noise as far as possible. Related term: common mode noise
CP CONTROL (Continuous Path Control)	Continuous path is a control method in which a path is followed without interrupting such as in uniform speed control.
CPC (Collaborative Product Commerce)	This refers to using systems, such as ERP, SCM and CRM, in collaboration mainly in the development of company products and maintaining a company-wide e-business infrastructure for companies using the Internet. This removes barriers between corporate organizations and business systems, and achieves an environment in which main partners, suppliers, clients, and departments in charge of production in-house can work in common business processes throughout all stages of the product life cycle.
CP-M/86	●Control Program for Microprocessors or Control Program and Monitor (CPM86) ●This is the OS for operating the 16-bit microprocessor 8086 series. ●The copyright belongs to Digital Research, Inc. (United States). ●It is a single-task OS, and does not support a hierarchical directory.
CPU shared memory	The CPU shared memory is a memory provided for each CPU module and by which data are written or read between CPU modules of the multiple CPU system. The CPU shared memory consists of four areas; • Host CPU operation information area • Restricted system area • Auto refresh area • User setting area • Multiple CPU high speed transmission area
CR absorber	●A surge killer comprising a capacitor C and resistor R connected in series. ●These surge killers are connected in parallel to contacts, triacs or inductive loads for the purpose of absorbing high-frequency surges by the capacitor. ●When they are connected in parallel to the load, the capacitor is charged when the load is turned ON, so interference sometimes appears in triac and transistor output. ●They can be used on both AC or DC power supplies, though current leakage is slightly higher with AC.
CRC	●Cyclic Redundancy Check (cyclic coding system or cyclic redundancy check) ●A method for detecting errors when data is transmitted. A special process is added to the data to generate the information for error detection, and the data is sent appended with this information. ●The same processing as the sending side is executed on the receiving side, and errors are detected by checking whether or not the same information has been obtained. ●By this system, information for error detection is not appended to individual characters. Since error detection is performed in units of data, the amount of data is less which results in higher error detection performance.

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用語 （Term）	解説 （Description）
Creep speed	●Low speed to which axis movement slows down to slightly before the origin during zero return operation. ●The speed must be switched to creep speed temporarily because it is difficult for travel axes to come to a perfect stop at the origin at high speed.
CRM (Customer Relationship Management)	This is a tool for improving sales efficiency and achieving client capture. This works by centrally managing all client-related information and automatically generating the optimum marketing strategy for each client segment.
CRP (Capacity Requirements Planning)	This is short-term capacity planning before manufacturing is started. It is used for ascertaining and making provisions for the requirements of production capacity needed for executing the priorities of each of the planned items. Production required orders, that are the output of materials requirement planning, are stacked at individual work centers, judgment as to whether production is possible is made, the production required order stacks are re-arranged based on this judgment, and the final production orders are issued.
CSMA/CD mode	●Carrier Sense Multiple Access/Collision Detection ●A type of network control mode. ●In this mode, the communications path for transmission is checked to see if it is free before each terminal device attempts transmission. ●If transmission is performed with the communications path busy, data will collide with each other. So, transmission is retried after waiting the time calculated by a predetermined random number. ●In this mode, systems can be built relatively cheaply since special devices for network control are not required. It is also called the contention mode. ●It is adopted on Ethernet.
CSV（Comma Separated Values）	Abbreviation for Comma Separated Values Text file in which the data are aligned and set off by commas and double quotations
CSV（Computer Set Value）	Abbreviation for COMPUTER SV. One of control modes and changes SV from upper computer.
CTO (Configure to Order)	Assembly of the product after the order from the client is finalized.
Current feed value	This is the calculated number of pulses corresponding to the travel distance that is output by the positioning module.
Current loop mode	A servo control mode in positioning. In this mode, torque is controlled by current.
Customize	Adjustment of the software configuration or design to rework the software to fit user preferences. For example, with some software, several element functions can be separated, and the user can select which functions are to be installed at installation. This can be called customization at installation.
CW (Clockwise)	Rotation in the clockwise direction. Rotation in the clockwise direction looking from the motor shaft end side.
Cycle time	The inverse of the overall production speed for a particular process. If manufacturing of 10 items/hour is possible now, then this means that the cycle time is 1/10th of an hour per 1 item, i.e. 6 minutes.
Cyclic counter function	A function for storing the number of input pulses to buffer memory at each preset cycle time for the duration that the counter function select start instruction signal is being input.
Cyclic transmission	A function for periodically communicating on a data link between stations in the same network.
D operation	Derivative action This is the operation that imposed on the manipulated variable that is in proportion to the rate of change (difference between the current value and the last value) of deviation DV (the difference between process variable and setting value). The time interval from the moment when deviation occurs until the manipulated variable determined by derivative action equals the manipulated variable determined by proportional control action is called Derivative time "Td".
D/A CONVERTER (Digital-to-Analogconverter)	A device having a function to convert the digital value expressing the No. of pulses to an analog value expressing the voltage (orcurrent).
D/A converter module	●Digital/Analogue ●A device that converts digital amounts to analog amounts. ●This device converts the digital amounts handled by the program on the programmable controller to the analog amount of voltage or current for output to external devices.

D

用語 （Term）	解説 （Description）
Data logger	A device for recording data.
Data source	Connection information necessary for accessing data using ODBC With Windows®, a data source name is assigned to connection information for management. The database can be accessed via ODBC by specifying the data source name in the MES interface function.
Database (DB) or relational database (RDB)	Data management method that follows relational data model logic One data is expressed as a collection of multiple items (Fields) and the data collection is expressed as a table. Data can be easily merged and selected using key data.
Daylight saving time (summer time)	A system where clocks are set ahead for a specified period during summer.
dB	●Decibel. ●Unit for expressing attenuation of energy. dBm is the unit for expressing the amount of optical power. ●Refer to “Transmission loss.” dBm/km indicates the attenuation per 1 km of optic fiber cable.
DB (database)	A collection of data shared by multiple application programs or users. This definition sometimes includes data management systems.
DB buffering	Function temporarily stores SQL text that failed to be sent due to a communication error and resends the text when the communications have been recovered
DBMS (DataBase Management System)	DBMS software manages databases as shared data and responds to requests to access that data. Data format and utilization procedures are standardized so that the data is made independent of specific application programs. Also, the productivity or performance of application programs and the efficiency of resource utilization can be improved by leaving the management of data up to dedicated software. DBMS can be classified into several types according to the representation system (data model) of the managed data. The most popular type at the moment is relational systems (RDBMS), with Oracle developed by Oracle Corporation and Access developed by Microsoft Corporation used on large- and small-scale systems, respectively, and each accounting for over half of their respective markets.
DBR (Drum Buffer Rope)	This is used in creating production schedules when applying TOC to scheduling of production plants. With this production control method, bottlenecks in production facilities are recognized, materials are input in sync with the production capacity at the bottleneck, and goods in process (i.e. with room to spare) capable of absorbing fluctuating elements (machinery malfunctions, momentary stoppages, etc.) that occur at the production side are located strategically. As a result, inventory can be considerably reduced, deadlines shortened, return on investment improved, and reliable production schedules created.
DC1/DC3 control	●A communications control mode. ●When the receive buffer runs out of free space and the receiving side can no longer receive, the DC3 signal is sent to the other device to request cancellation of data transmission. Alternatively, when the receive buffer frees up by receive processing being executed and the receiving side can receive again, the DC1 signal is sent to the other device to request resumption of data transmission. ●The sending side treats the DC1 and DC3 signals received from the other device as control codes. When DC1 is received, data transmission is started, and when DC3 is received, data transmission is canceled.
DC2/DC4 control	●A communications control mode. ●In this control mode, DC2 and DC4 codes received from the other device are regarded as control codes, and the codes inserted between DC2 and DC4 are regarded as the data.
DCS(Distributed Control System)	Distributed digital control system with microcomputer.
DDC（digital display controller）	A control with digital display controller.
Dead stock, retained stock, immobile stock	Stock with no prospect of being sold that impacts cash flow. Retained stock and immobile stock mean the same.
Dead time	Time interval of output variable change to input variable change. P_DED of process FB is applied.
Debugging	The correction of errors in a program so that it behaves correctly.
Decoding	●8→256 bit decoding refers to resolving the data of 8 signal leads to 256 types. ●Set the bit positions indicated by numerical values to ON. ●The reverse operation of encoding.

用語 (Term)	解説 (Description)
Dedicated link instruction	Dedicated instruction that is used for transient transmission with other programmable controllers. Communications can be made with programmable controllers on the same or other networks.
Default	An already built-in setting value that is used when no operations or settings have been made by the user. "Initial settings" and "initial values" have a similar meaning.
Derating	●Use of a component with extra margin of rated voltage or current. ●For example, by using AC240V2A rated output for a AC200V0.5A load, the failure rate is lowered, and a longer service life can be expected. ●In particular, derating is used, for example, in high temperature states or for inductive loads having a high rush current.
Design pressure	In temperature/pressure correction of flow rate, when measuring flow rate by using different pressure from design specification pressure, the correction to convert to flow rate in design specification pressure is needed. Design pressure in this case is design specification pressure.
Design temperature	In temperature/pressure correction of flow rate, when measuring flow rate by using different temperature from design specification temperature, the correction to convert to flow rate in design specification temperature is needed. Design temperature in this case is design specification temperature.
Deviation	The difference between setting value (SV) and process variable (PV)
Differential method	●A method where the signal and the same signal with polarities reversed are output simultaneously as a pair when a single signal is output. ●This method enables transmission of high frequencies and is resistant to noise. Because of these features, it is used for the transmission of high-speed signals such as I/O of pulse strings. ●Generally, the sending side is called a driver and the receiving side is called a receiver, and a dedicated IC is used.
Differential pressure	Pressure measured based on pressures other than atmosphere pressure and full vacuum. To differentiate from the others, add diff. after units. Example: 1kg/cm^{2}diff. Applied to such as flow rate measurement by differential pressure.
Digital bus connection	●Generally, a pulse train is used as the command output from a programmable controller positioning module to a servo amplifier. However, recently, due to the increasing digitalization of devices, a system for binding the bus line of the CPUs of servo amplifiers with the positioning module has emerged, which enables the building of even higher precision and higher grade systems. ●The MELSEC AD70D and A73CPU modules are connected by this digital bus connection.
Digital filter (Index filter)	This is used as filter for eliminating noise etc. of process variable (PV). Operate the sum of weight (PV filter coefficient) of Current process variable and previous filter value. The digital filter function of analog input process FB (P_IN) is applied.
Digital IC	●An IC that is used for ON and OFF logic. ●CMOS and other ICs are used on programmable controllers.
Digital output value	The numeric value converted to the value within 0 to 10000 for adjusting A/D conversion output value to the resolution (1/10000FS)
Digital RGB	●A type of video signal system that expresses color signals by the ON/OFF state of signals for the three primary colors red (R), green (G) and blue (B). ●Digital types can express signals by H(igh) and L(ow), and up to 8 synthesized colors can be displayed based on the three primary colors. ●For colors exceeding this number, a technique called "tiling" is used.
Digital switch	●A switch that inputs and instructs from 0 to 9. ●Though these are used for inputting numbers on a programmable controller, BCD code is often used. So, its ON state is shown below. ●When 2, this indicates that the 2 terminal is ON, and when 6, this indicates that the 2 and 4 terminals are ON.
DIN standards	●Deutsch Industie Norm ●German industrial standards.
Direct action	In PID control, an activity to increase manipulated variable MV against increase of process variable PV. (Example: cooler)

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用語 （Term）	解説 （Description）
Direct method	●A method of processing programmable controller inputs and outputs, in contrast to the refresh method. ●The direct method is easy-to-understand since it immediately captures and processes the ON/OFF operations of input X and output Y. ●This is also called the sequential input/output method.
Direct output	Direct output refers to immediately outputting output Y to the outside of the programmable controller the moment that a command is executed by the program.
Disable	●Disable signal. ●On a programmable controller high-speed counter module, counting is not performed when this is turned ON. There are 2 types of signal, special Y for the program and external input. ●The opposite of disable is enable.
Disable alarm	Disable alarm detection to alarm items of tag alarm by setting as disable.
Dispatch, dispatch board	Issuing of work instructions to individual workers at a production site. In the old days, work instructions were written on a card, and work instructions were posted inserted into something like a letter rack. Since there are many workers, this "letter rack" thing has taken the form of a board. This board is called a "dispatch board."
Distortion factor	●Devices are designed on the assumption that alternating current should be a sine wave. ●This is the ratio that various factors cause this sine wave to become distorted.
Distributor	A signal distributor which supplies power to a 2-wire transmitter (detector), and retrieves standardized signals (4 to 20mA or 1 to 5V) from a PLC.
DMU (Digital Mock-Up)	Simulation software for comparing and reviewing the external appearance, internal configuration, etc. of a product using CAD. Or, a 3-D model created using this kind of software.
DNS（Domain Name System）	DNS is an abbreviation for Domain Name System. This system translates IP addresses into domain names easy for the user to remember and manages them.
DOG SIGNAL	The near-point dog of the OPR.
DRAM	●Dynamic Random Access Memory (DRAM) ●A type of RAM memory that is cheap and compact but has a large holding current, in contrast to SRAM.
DTR/DSR control	●When communications are exchanged with an external device (computer, printer, etc.) via the RS-232C port, whether or not data can be sent and received is controlled by the DSR (Data Set Ready) and DTR (Data Terminal Ready) signals. ●Same as ED/DR control.
DV（Deviation）	Deviation The difference between setting value (SV) and process variable (PV)
DWH (Data WareHouse)	A system of analyzing the relevance between respective items in large volumes of chronologically stored business data. This data warehouse system closely examines the relevance between various elements, something that could not be made clear by conventional simple totalization.
DXF (Data eXchange Format)	A file format used in the CAD software "AutoCAD" developed by Autodesk. This is, in effect, an industry standard file format for storing 2-D and 3-D vector data.
Dynamic brake	●A brake function for short-circuiting between terminals on a servo motor via a resistor to consume rotational energy as heat and immediately stop servo motor operation when protection circuit has been actuated at a power interruption or when at an emergency stop (EMG signal is issued). ●A brake torque greater than that of an electromagnetic brake can be obtained. ●However, note that there is no holding torque when axes stop so a mechanical brake must be applied to hold axis movement.
Dynamic scan	●Execution of scanning on individual modules separately from the CPU. ●This method is adopted for I/O composite modules capable of efficiently securing a number of points when there are many I/O points.

用語 （Term）	解説 （Description）
EBCDIC	●Extended Binary Coded Decimal Interchange Code ●Extended binary coded decimal code. ●A coding scheme for computers to express numbers, alphabet characters, special characters, and other information in 8 bits. ●After each digit of the decimalnumber is expressed in 4 bits to become BCD code, an additional 4 bits are appended to this code. As 8 bits, this represents 256 separate distinguishable variations.
EC (Electronic Commerce)	A form of commerce where networks such as the Internet are used to conclude contracts and settle payments, for example.
Edge relay (V)	The edge relay (V) is a device in which the on/off information of contacts from the beginning of the ladder block is memorized. The device can be used only at contacts (cannot be used as coils). ・Applications of the edge relay The edge relay can be utilized to detect the leading edge (off to on) in programs configured using index modification.
EDI (Electric Data Interchange)	The electronic execution of transactions such as order receipt/issue information between different companies.
EEP-ROM	●Electrically Erasable Programmable Read Only Memory (EEPROM, E2ROM) ●A type of read-only memory. ●This memory can be written by application of a voltage. ●Memory content does not disappear even in the event of a power interruption. ●The external shape is the same as an IC-RAM.
Effective load factor	Ratio of continuous effective load current to rated current.
EL	● Electroluminescence. ●A display device. ●Brightness is low like that of liquid crystal displays (LCDs), making it is easy on the eyes.
Electrical angle	An imaginary angle where one AC cycle is taken to be 360°.
Electromagnetic brake	●A brake for mechanically locking the output axes of the servo motor to prevent the machine from falling if a power interruption or alarm occurs. ●When machining with vertically operating axes, be sure to use a servo motor with an electromagnetic brake. ●This brake is for holding axes and cannot be used for servo motor deceleration (braking) applications.
Electromagnetic flowmeter	When conductive fluid flows across magnetic field, induces electromotive force in proportion to flow velocity. A flowmeter which detects a flow rate by this theory is called electromagnetic flowmeter.
Electromagnetic induced noise	●Noise that is generated by a magnetic field being formed when current flows on an electric lead, causing voltage to be induced on other electrical leads nearby. Electromagnetic induced noise is greatly influenced by current. ●A large voltage is induced and more likely to be relayed as noise the closer two electrical leads are near each other, the longer the distance these two leads are in parallel, or the larger the current or more intense changes in that current are. ●To prevent this, first decrease noise on the primary side and then cut off the source of the noise. ●Subsequent measures include routing electrical leads as far away from each other as possible, or not routing them in parallel and using twisted-pair cable on the side that is subjected to the noise.
Electromagnetic relay	●Switch used for relaying signals. This switch has a coil and contacts, and contacts turn ON/OFF when a voltage is applied to the coil. It has 2 to 10 contacts. ●Its features include isolated inputs and outputs, a capability to switch large currents ON/OFF by a small coil current, and many contacts. ●Though contacts are worn by repeated open/close operation and attention is required to the high rate of defective contacts, an advantage of this switch is that contacts are electrically isolated.
Electromagnetic switch	●A switch for a motor. It comprises an electromagnetic contactor and a thermal relay. ●Current is switched by an electromagnetic contactor, and motor burnout is protected by a thermal relay.
Electronic gear	●A function for simplifying the relationship between the number of input command pulses and the amount of actual movement of the machine in positioning. ●This differs from a mechanical gear in that motor torque does not change even if a higher reduction ratio is set.

用語 (Term)	解説 (Description)
Electronic thermal	A function for computing the thermal characteristics of a motor from the motor current value and operating frequency internally on an inverter or servo amplifier to protect these components from overheating.
Electro-pneumatic converter	A converter which converts a standardized signal (electrical signal) to a standardized signal (pneumatic signal). Electro-pneumatic transducer.
Electro-pneumatic converter	A converter which converts a standardized signal (electrical signal) to a standardized signal (pneumatic signal). Electro-pneumatic transducer.
Electrostatic induced noise	●Since electrostatic capacity (stray capacitance) exists between two electric leads, a voltage is generated on the other electric lead if voltage is applied on one lead. ●The degree to which voltage is generated increases the closer the two electric leads are to each other or the higher the frequency of the voltage (e.g. noise). ●To prevent this, the electric leads should be separated as far away from each other (at least 40x the lead thickness), or the electric leads should be shielded. ●Ordinarily, shielded cable is used, and the shielding is grounded.
EMC	●Electromagnetic Compatibility ●Compatibility with electromagnetic energy. ●Technology for minimizing electronic devices' sensitivity to noise.
EMI	●Electromagnetic Interference ●Noise generated from electronic devices that interferes with other equipment. Programmable controllers are often affected by interference, and sometimes also emit interference. ●In Japan there is the noise voluntary regulatory body, the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). ●Products with the VCCI mark comply with this voluntary regulation. ●Class 1 for commercial and industrial areas and Class 2 for residential areas are already determined.
Emulator	Hardware or software for executing equivalent running on a certain device without porting the software that is to be run to another device.
Encode	A 16→4 encoder expresses the position of the most significant bit that is ON in data that has been extended to 16 bits as a numerical value of 4 bits. An encoder is used, for example, in handling data between a programmable controller and a computer.
Encoder	●A unit that binarizes input data to ON and OFF states. A pulse generator is an example of an encoder. ●A sensor that is installed on a servo motor and that detects the rotation angle or rotation speed of the motor shaft. It is also called a detector. It operates by absolute system and incremental system.
EP-ROM	●Erasable Programmable Read Only Memory (EPROM) ●A type of read-only memory. ●This memory is written in a single operation. ●Memory can be written to after the entire content is erased by exposure to UV rays. (Recyclable) ●A window for exposure UV irradiation is located on its top surface and anti-erasure tape is affixed over this window at all times. ●Memory content does not disappear even in the event of a power interruption.
ER/DR control	●A communications control mode. ●The ER signal controls reception, and the DR signal controls transmission. ●When the receive buffer runs out of free space and the receiving side can no longer receive, the ER signal is set to OFF, and the DR signal on the sending side corresponding to this is set to OFF to cancel transmission. ●Alternatively, when the receive buffer frees up by receive processing being executed on the receive data and the receiving side can receive again, the ER signal is set to ON, and the DR signal on the sending side corresponding to this is set to ON to start transmission of data. ●Same as DTR/DSR control.
ERP (Enterprise Resource Planning)	A method/concept of managing an entire corporation in an integrated manner from the standpoint of effective utilization of enterprise resources to improve business efficiency.
Error control system	●A system where data is sent and checked on the receiving side with measures in place just in case an error is generated, for example, by noise during transmission. ●If necessary, a resend request is issued. ●This is widely used in long-distance digital communications.

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用語 （Term）	解説 （Description）
Error counter	●A counter built-into the drive module used in positioning. ●A counter of accumulated error pulses (deviation values) obtained by subtracting feedback pulses from the command pulse from the controller.
Error invalid station	Prevent the master station from detecting a slave station as a faulty station even if the slave station is disconnected during data link. This can be used when replacing a slave station during data link, for instance.
Ethernet	●A standard network communications protocol used on personal computers and workstations. ●It is established as the IEEE802.3 standard. ●Data link control is by CSMA/CD protocol, and the data transfer speed is 10 Mbps to 1 Gbps. ●According to cable standards, 10BASE5 Ethernet uses thick co-axial cable for wiring in a bus topology, 10BASE2 uses thin co-axial cable for wiring in a daisy chain topology, and 10BASE-T/100BASE-TX/1000BASE-T uses twisted-pair cable for wiring in a star topology.
Exclusive OR	Logic that enables detection of signal mismatch.
Execution cycle/Control cycle	Program type POU which consists of such as IN, PHPL, OUT1 starts at regular cycles. This cycle is called execution cycle. In PX Developer, the execution cycle of high-speed (100ms), normal speed (200 to 500ms), low-speed (500 to 5000ms) can be set. For control operation cycle such as PID, BPI, set as a control cycle (CT) differently from an execution cycle. Control cycle should be set to be the integral number multiple of execution cycle. The relation between execution cycle and control cycle Example: execution cycle of PID control is 0.2 seconds, and control cycle of PID instruction is 1.0 second.
Extension base	●This is a building block type programmable controller, the unit for attaching I/O modules and intelligent modules that cannot be attached by the main base alone. ●Since the CPU cannot be attached, the extension cable is used to connect to the main base to communicate information.
Extension cable	This cable is for communicating information between the main base CPU and programmable controller extension modules (extension base) or extension modules (extension base).
External fault diagnosis	●Comparison with preset condition data to execute fault diagnosis of an external control device in accordance with I/O signals from a control device or operation of a detection device such as an internal relay. ●Exclusive fault diagnosis software packages and modules are available for MELSEC. These are capable of performing 6 checks: sequence time check, count check, normal pattern check, illegal pattern check, higher/lower limit check, and reciprocal operation check.
F.H, F-HALF	●First Half ●The top 32 dots of the ON/OFF display LED of a 64-point I/O module.
F.ROOP	●Forward Loop ●The forward loop in a data link.
FA (Factory Automation)	The automation of factories using computer control technology. Also, equipment and devices used for automation. Overseas, FA is expressed as IA (Industrial Automation).
Fail-safe	The implementation of appropriate measures to enable operation on the safe side when a malfunction occurs.
Fall time	Time until an ON signal completely turns OFF.
Fast-blow fuse	●Fuse for protecting transistors and triacs. ●This fuse is exclusively for discrete semiconductor devices and has the property of blowing quickly.
FB conversion	An intelligent function module parameter (initial setting/auto refresh setting) is automatically converted into an FB.
Feed pulse	Pulse that is issued from a commanding device, such as a programmable controller positioning module, to a servo module or stepping motor.
Feed screw	●This is the basic screw mechanism that rotates to perform positioning. ●Ball screws are often used since they have less backlash and dimensional error.

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用語 （Term）	解説 （Description）
Feedback pulse	Pulse train that is returned to confirm that operation has been executed as instructed by an instruction given in automatic control.
FG	●Frame Ground ●The ground terminal on a programmable controller. ●A 5V or 24V noise filter ground terminal on a CPU, I/O or other module. ●It is also connected to the shield pattern on the printed circuit board.
Field	Corresponds to a column in a relational database and indicates a type of data (Record attribute).
FIFO (First In First Out)	A system whereby data is stored and then retrieved from that location. A method that allows data to be retrieved in the order that it was stored; that is, the newest stored data is retrieved last of all. Data is handled by this method in data structures called "queues."
File Register	The file register (R) is a device provided for extending the data register. The file register can be used at the same processing speed as the data register.
First order lag filter	This is used as filter for eliminating noise etc. of process variable (PV). Execute the first order lag operation by the following expression. Process FB (P_LLAG) of lead-lag compensation is applied.
Fixed lead time	The timing that parts used for a particular product is estimated from the product's deadline. The lead that is currently set to each individual product in the production management system at that time is deducted from the deadline. This lead time is called "fixed lead time."
Fixed value action	The operating status of when the set value (SV) is fixed
Flip-flop	●An element for storing information. ●A flip-flop uses two transistors, and has a function for continuously holding information when the ON signal is input.
Flowmeter	The following shows the representative measurement methods of flowmeter. Hydrometry is often applied in processes along with manometry, thermometry.
FLS SIGNAL (forward limit signal)	This is the input signal that notifies the user that the limit switch (b contact configuration, normally ON) installed at the upper limit of the positioning control enabled range has been activated. The positioning operation stops when the FLS signal turns.
FMS	●Flexible Manufacturing System ●A system that is compatible with the manufacture of small lots of many items. ●The overall system is managed by computer, and industrial robots and other industrial equipment are introduced with a view to providing a flexible response to changing products and manufacturing volume without major changes being made to the production line.
Free run	●A state where current is not supplied to the servo motor, both the dynamic brake and electromagnetic brake are disabled, and the servo motor is not controlled. ●In this state, the servo motor shaft operates by external force since no torque is generated.
FTP (File Transfer Protocol)	A protocol that is used to transfer files over a TCP/IP network such as the Internet or Intranet.
Full scale	A full input range. For example, when the selected input range is -200.0°C to 400.0°C, the full scale is 600.0.
Full-closed control	A positioning control that uses an encoder for detecting the position of machine end. It is used when high positioning precision is required.
Function Blocks (FBs)	An FB is designed to convert a ladder block, which is used repeatedly in a sequence program, into a component to be utilized in a sequence program.
G CODE	These are standardized (coded) 2-digit numerical values (00 to 99) designating various control functions of the NC module. Also called G functions. Example : G01 Linear interpolation G02 Circular interpolation CW (clockwise) G04 Dwell G28 OPR G50 Max. spi

用語 (Term)	解説 (Description)
Gain	●Altering the ratio when two values are in a proportional relationship. ●With an A/D conversion module, the analog input value (voltage or current) at which the digital output value becomes 1000. ●The 4 to 20 mA characteristic of current input refers to an offset of 4 mA and a gain of 20 mA. ●With a D/A conversion module, the value that is output as analog (voltage or current) when the digital input value is 1000. ●On a servo, the numerical value that indicates how much the instruction is tracked. Increasing gain improves response but makes oscillation easier to occur.
Gain drift	Gain variation caused by temperature
Gateway function	●Generally, if an attempt is made to connect to mutually different networks, protocol conversion is required since communications methods and functions are different. ●A function for bridging across different networks to enable mutual communications.
Gauge pressure	Pressure volume described based on atmosphere pressure (=0), and widely used. Pressure higher than atmosphere pressure is positive pressure, lower than atmosphere pressure is negative pressure. When differentiation from absolute pressure is needed, add G after the unit. Example: 3kg/cm^{2}G
GD^2	The inertia moment. The sum total of the mass (dm) of each small area configuring an object multiplied by the square of the distance (r) of each of those areas from a given straight line. The relation with $I = \int r2dm$ GD^2 is given by 4gI, with "g" being gravi
GI	●Graded index, a type of optical fiber. ●The diffraction index of the fiber core changes gently inside the cross-section, and communications distortion due to the incident angle of light is small.
GP-IB	●General Purpose Interface Bus ●Interface used for data transactions between a computer and measuring equipment and devices. It is also called the IEEE-488 bus. ●Up to 15 devices can be linked on this bus. ●Data transfer is bidirectional, half-duplex, 8-bit parallel transmission, and the maximum length is 20 m.
Gross requirement	If the production volume of a product is determined, parts expansion is performed on this volume, and the number of each parts that comprise the product is known. This number is called "gross requirement."
Gross weight output value	The A/D conversion output value converted in weight by two-point calibration and zero offset+C689
Group designation	●On a MELSECNET/10, H or CC-Link IE controller, a function for dividing up stations in a 1 network into multiple (1 to 9) groups and writing data simultaneously by transient transmission to multiple stations that belong to one group. ●Designation for executing this grouping is called "group designation," and this is executed according to switch settings on the network module.
Group No.	Number that is assigned for transient transmission to any given stations. By specifying a group of stations as transient transmission target, data can be sent to the stations of the same group No.
H level	●High level. ●State in which I/O voltage is high. ●If operation is guaranteed at low voltage up to 9V with respect to the reference voltage 24V, then 9V to 24V is H level.
H, HEX	●Hexadecimal ●Both express a number system using base 16.
Handshake	When data is communicated on a data link, first the send request and receive response signals are mutually exchanged between the receiver and sender, whether or not data transfer is possible is confirmed. If transfer is possible, the data is sent, and, if transfer is not possible, the data is not transmitted. Handshake refers to this exchange of signals for confirming communication.

用語 （Term）	解説 （Description）
Hard-wired	●Wiring. ●Hard-wiring is a method of joining coils (e.g. relays or timers) and contacts to configure a sequence. ●If a programmable controller is used, soft-wiring can be increased and hard-wiring can be decreased. ●Soft-wiring refers to connections that do not actually use wiring, as in programmable controller programs.
HDLC procedure	●High-level Data Link Control procedure ●A standard determined in JIS X 5104 to 6.
High alarm/High high alarm	High limit alarm (PH)/high high limit alarm (HH)
High-speed counter module	Counters on a programmable controller CPU are limited to about 10 counts per 1 second due to the relationship with switch scanning. High-speed counting above this rate is performed on a high-speed counter module provided separately from the programmable controller CPU.
High-speed retentive timer	This type of timer measures time in increments of 0.01 to 100ms. The timer starts time measurement when its coil is turned on, and when it times out, the contact is turned on. Even if the timer's coil is turned off, the current value and the on/off status of the contact are retained. When the coil is turned on again, the measurement restarts from the retained current value.
High-speed timer	This type of timer measures time in increments of 0.01 to 100ms. The timer starts time measurement when its coil is turned on, and when it times out, the contact is turned on. If the timer's coil is turned off, the current value is changed to "0" and the contact is turned off. The time increment is set in the PLC system tab of the PLC parameter dialog box. The default is 10.0ms, and it can be changed in increments of 0.01ms.
Host name	The name of a computer connected to the network which is easy for people to understand.
HOT STAND-BY mode	A mode in which a device is in the ON state and standing by so that it can be started up for operation at any time.
Hot start	A system which outputs from the previous values when restart after a power failure of control system
HTML (HyperText Markup Language)	A markup language for programming Web pages. HTML is used for programming logical structured documents and how they appear on the web, etc. It can also imbed images, audio, video, hyperlinks to other documents, and other objects in documents. Normally, a web browser is used to view documents programmed in HTML. However, since HTML documents are a type of text document themselves, they can be opened in a text editor and read as documents along with their tags.
HTTP (HyperText Transfer Protocol)	A protocol used by web servers and clients (web browsers, etc.) for sending and receiving data. HTML documents and image, audio, video and other files linked to documents can be sent and received including their representation system and other information.
Hysteresis	A characteristic which outputs variables depending on directivity past record of input variables.
I operation	Integral operation The action that continuously changes the manipulated variables, in order to eliminate deviation DV (difference between process variable and setting value). It can eliminate the offset caused by proportional action. The time interval from the moment when deviation occurs until the manipulated variable determined by integral action equals the manipulated variable determined by proportional control action is called Integral time "Ti"
I/O handover	●For the exchange of information between 2 or more programmable controllers, the output of one device is connected to the input of the other to convey ON/OFF states. ●A number of electric leads for the number of I/O points to transfer these states to is required.
I/O No.	With MELSEC, numbers appended to inputs X and outputs Y are hexadecimal numbers determined by module assignments.
I/O Refresh (Refresh Processing with Input/Output Modules)	The following process performed before sequence program operations. • On/off data input from the input module or intelligent function module to the CPU module • On/off data output from the CPU module to the output module or intelligent function module
IC	●Integrated circuit. ●A circuit that groups together transistors, diodes, resistors, capacitors, and other elements to provide various functions.

用語 （Term）	解説 （Description）
IC card	●Card with built-in IC memory. ●Production instructions and other memory content can be written or read by a card reader. ●These cards have a memory capacity larger than that of magnetic cards at 1, 000?6, 000characters. EP-ROM and EEP-ROM are often used as memory. ●When IC-RAM is used, a backup battery can be integrated in the card. ●These cards are more expensive than magnetic cards. ●Some cards have a built-in microprocessor in addition to memory.
IC tag/RF-ID tag	An IC chip, normally equipped with wireless communications functions, that is used for identification of commodities and goods, for example. To ensure wider use of this chip on the market, compatibility between a wireless system and its frequency (Radio Frequency = RF) and identification (Identification = ID) system must be secured. As a result, standardization of these chips is being promoted. These chips are also called RF tags or RFID tags. Compared with barcodes, large volumes of data can be read/written (i.e. additionally written) in a contactless manner. In addition, they are reusable and are in the process of being applied to product control by being attached to machined parts, etc. at production sites and being written in real time with machining conditions, inspection results and other information.
ID plate	●A magnetic card that holds code for identifying data or people, for example. ●These cards hold employee information and are used as ID cards to control admission and limit access to information in order to maintain the security of in-house information in companies and other institutions.
Identification	Find process parameter (PID constant) by Step response method.
IEC	●International Electrotechnical Commission ●An international private organization that produces international standards in the field of electricity and electronics. ●Effectively, this organization shares ISO's role in electricity and electronics. ●IEC's standards are intended to promote international cooperation regarding the solving of all problems in standardization in the technical fields of electrical equipment and electronics, and related matters such as the evaluation of compatibility with standards, and promoting international understanding by means of this. ●IEC has no compelling power, though every country is working to comply with these standards.
Imperfect derivative	If derivative is applied to deviation as it is, it may be affected by increase of high-frequency noise, and since the time range of MV is narrow (e.g. in case of step-shaped change, it will be output only at the moment like pulse shape.). There may be the bad influence that the energy which outputs final control element fully is not given. Therefore, normally the derivative term input with imperfect differentiation for which filter shall be applied once. The derivative action of QnPHCPU, QnPRHCPU is imperfect derivative.
Increment system	●A system of performing positioning control by a specified travel amount from the address of the current stop position. ●This system is used for constant rate feed, for example. ●In contrast, there is the absolute system.
Index modification	Index modification is indirect address specification using the index register. When the index register is used, the device number is (directly specified device number) + (index register contents).
Index table	An indexing table that rotates a rotating object in fixed angle increments.
Industrial unit data	Measured data expressed in actual industrial unit rather than expressed in percentage.
Initial communications	This refers to sending link parameters once to slave stations when the master station on a data link has been turned ON or CPU status has been changed from STOP to RUN.
In-line configuration	This refers to the relocation of manufacturing facilities in manufacturing process order.
In-line setup and off-line setup	A method for performing setup without stopping the line. Though the line must be momentarily stopped when it is switched, setup work itself can be performed separately from line work, thus eliminating lost time. This is called "off-line setup." Whereas, setup which involves stopping the line is called "in-line setup."
Inline ST	Inline structured text is a function to edit/monitor a program by creating an inline structured text box that displays a ST program, at the coil instruction area on the ladder editor of the project with labels. With this function, a numeric value operation or a character string process can be easily created in the ladder program.

用語 (Term)	解説 (Description)
In-position range	●The range in which the positioning completion signal (INP) is output
In-position signal	●The (INP) signal is output if the servo amplifier judges that positioning operation is completed when the number of accumulated error pulses has reached or fallen below the in-position range setting value. ●This is used as a warning for completion of positioning or signal indicating that positioning is within range.
Input override	A function which enables process variable (PV) simulated input when input signal fails. • Loop tag A function when cannot attain the proper PV input signal due to such as detecting sensor errors, the input status can be set on a screen. However, external output is executed. (It is used when batch sequence transition is to be executed.) • Status tag A function when cannot attain the correct input status due to such as imperfect contact of the switch, the input status can be set on a screen. However, external output is executed. (It is used when batch sequence transition is to be executed.)
Input range extended mode function	The analog input range, 4 to 20mA and 1 to 5V can be increased to the input range of 0 to 22mA and 0 to 5.5V, respectively.*3 A/D conversion can be performed even if the input range falls below 4mA or 1V, when sensors do not measure concrete values.
Input resistance	Resistance equivalent value held internally by a module at the input terminals of A/D conversion modules and input modules
Input signal error detection function	This function detects voltage or current input values exceeding the setting ranges. A channel set to averaging processing can be checked every sampling processing.
Instrumentation flow chart	A flow chart which shows entire control system and describes such as piping, detector, final control element, controller in symbols.
Integration timer	A timer that uses a system of integrating the time that the coil has been ON.
Intelligent device station	A station that exchanges I/O signals (bit data) and I/O data (word data) with the master station by cyclic transmission. This station responds to a transient transmission request from another station and also issues a transient transmission request to another station.
Intelligent function module	A MELSEC-Q/L series module that has functions other than input and output, such as an A/D converter module and D/A converter module
Intelligent function module device	The intelligent function module device allows direct access from the CPU module to the buffer memories of the intelligent function modules which are mounted on the main and extension base units. Example: U0\G20480 ..... Buffer memory addess 20480 (5000h) of I/O slot No.0
Interlink transmission	At a relay station, the link device of the master station is transferred to another network module.
Interlock	●A condition for locking machine operation to prevent it from advancing to the next operation until the currently executing operation ends. ●Interlock is used for preventing damage to units and runaway.
Internal relay	A relay exclusively for sequence programs.
Interpolation operation	Execution of motion by the combined simultaneous operation of two or three motors in positioning.
Interpreter type BASIC	●A type of BASIC where commands are read one word at a time and executed while being translated to machine language. ●Though execution is slower than compiler type BASIC, this type of BASIC has an advantage that debugging, etc. of programs is easier to perform.
Interrupt command	●Signal for preferentially inserting an interrupt during execution of the programmable controller program. ●When an interrupt command is input while the program is executing arithmetic operations, operations so far are canceled, and execution immediately switches over to the interrupt program. ●When execution of the interrupt program ends, execution returns to the step in the original program and is resumed from that step.

FA用語解説集

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用語 (Term)	解説 (Description)
Interrupt counter	●Counter used for the interrupt program. ●It can be used by setting in parameters in addition to regular counters.
Interrupt processing	The processing of temporarily canceling the currently executing sequence program when an interrupt request is generated and executing the interrupt program corresponding to that request.
Interrupt program	Program that is executed preferentially after canceling execution of the currently executing program when an interrupt request is written in the program.
Inter-station test	●In MELSECNET, a test that is performed to test the quality of the link module and cables between 2 stations. ●The station with the smaller No. is checked as the master station while the other one is checked as the slave station.
IRTB	●Industrial Real Time BASIC ●BASIC for industry. ●An expanded version of the computer programming language, BASIC, with a shorter processing time that is applied to industrial sites. ●M-IRTB for the Mitsubishi Electric Line Master also is available.
ISO	●International Organization for Standardization. ●A United Nations organization that unifies standards around the world with the intention of expanding trade, improving quality and lowering prices, amongst other things. ●ISO has no compelling force, though Japan's JIS also is attempting to comply with these standards. ●IEC deals with standards for the electrical and electronics industries in parallel.
Isolation transformer	●A transformer whose primary and secondary coils are isolated and are wound independently. ●Noise is hardly conveyed on this type of transformer. ●Noise is even more difficult to convey on shielded transformers since the primary and secondary coils are shielded.
JAN code	Japanese Article Number (JAN code)
JIS	●Japanese Industrial Standards (JIS). ●Electrical and electronic hardware is classified as JIS C, and information and software are classified as JIS X.
Job	Unit for accessing a database
JOG	●The action of moving a workpiece to a desired position in accordance with externally input signals. ●On a positioning module, JOG operation can be performed by entering parameters and JOG speed. Note, however, that when prolonged operation is set ON, JOG operation stops when the stroke range (high limit?low limit) is exceeded.
Just-In-Time	This is one of the two mainstays of the Toyota manufacturing system. This system refers to a mechanism and approach of manufacturing and transporting only required amounts of required items at the required time in order to respond to changes and improve business efficiency. It presumes standardization, and its three basic principles are a "pull system", "regard processes as flows" and "determine tact by required numbers."
Kanban	A management tool for achieving just-in-time production. It functions as "production, transportation instruction information," "see with your eyes management tool" and "process/work improvement tool."
KPPS	●Kilo-pulse per second ●Number of pulses per 1 second. ●80KPPS is 80,000 pulses per 1 second.
L level	●Low level. ●State in which I/O voltage is low. ●Actually, this is 0V. However, if 0V to 5V is regarded as 0V, then 0V to 5V is L level.
L.H, L-HALF	●Later Half (L-Half). ●The bottom 32 dots of the ON/OFF display LED of a programmable controller 64-point I/O module.

用語 (Term)	解説 (Description)
Ladder diagram	A drawing that expresses a program in the format of relay symbols, namely, a sequence.
LAN	●Local Area Network ●An on-site data network that links computers and devices on a high-speed transmission path in small local areas, such as buildings or factory sites. ●Optical fiber cable, co-axial cable and twisted-pair cable, for example, are used as the transmission medium. ●LAN connection is by bus topology in which devices are connected to 1 bus, star topology in which a hub is located at a center from which lines branch out to devices, and ring topology in which devices are connected on a ring-shaped transmission path.
Latch	●This is a function for holding the device ON state and data values if the programmable controller CPU power supply is turned OFF without the device ON state or data values being cleared until power is turned back ON. It is also called power interruption hold. ●The purpose of the latch is to remember the state before a power interruption and reproduce it after power is turned ON again.
Latch counter function	A function for storing the counter current value to buffer memory when the counter function select start command signal is input.
Latch relay	A relay that does not turn OFF when it is in an ON state even if there is a power interruption.
Lead time	This refers to the time from the work request up to completion.
Leakage current	●Small current that flows on contacts and thyristors, etc. when the power is OFF. ●Some of these have a surge absorber installed in parallel and a trace current is flowing at all times to this. For this reason, small relays sometimes do not turn OFF and neon lamps light in a power OFF state.
LED	●Light Emitting Diode ●To put it briefly, a semiconductor light source. ●Many of these can be arranged to make a text display device.
Level meter	The following shows the representative level meter types. Contact type：differential pressure (liquid-operated), float-type (buoyancy), purge, electrode, capacitance Non-contact type：ultrasonic、microwave type
Libraries	A library is an aggregation of data including POUs, global labels, and structures organized in a single file to be utilized in multiple projects.
Library	This refers to programs with specific functions being stored as parts so that they can be used by other programs and grouping of multiple programs parts into a single file, or library. Libraries themselves cannot be executed individually; they operate as parts of other programs.
LIFO (Last In First Out)	A system whereby data is stored and then retrieved from that location. A method that allows stored data to be retrieved starting with the newest stored data. The oldest stored data is retrieved last. Data is handled by this method in data structures called "stacks."
Line controller	A device that controls all or part of a production line.
Linear interpolation	●Arithmetic operation executed by the CPU to perform automatic operation to proceed along a straight line when two motors, one each for horizontal (X) and vertical (Y) direction feed, are operated simultaneously to execute positioning.
Linear servo motor	●A servo motor that provides linear motion as opposed to a servo motor that provides rotary motion by rotation of a shaft. ●On a linear servo system, high speed and high acceleration can be obtained compared with ballscrew systems. Linear servo systems are also longer life since there is no ball screw wear.
Linearize	●To make non-linear input linear. ●For example, non-linear input of thermocouples and resistance temperature detectors is changed to linear output.
Link data	Data that is communicated during refreshing on the data link.
Link device	Devices exclusively for the data link, or link relay B, link register W, link X, and link Y.
Link parameters	Parameters that set the overall configuration of the data link

用語 （Term）	解説 （Description）
Link refresh	Processing of data transfer between link devices of the network module and CPU module devices. Link refresh is performed in "END processing" of the sequence scan of the CPU module.
Link scan	●With MELSECNET, this refers to the operation of sending refreshed data to slave stations and capturing slave station information when refreshing of the master station is completed. ●Actually, the scan is executed 1 station at a time starting from station No.1. ●When the link scan ends, all local stations are refreshed and capture the information of the master station and output the information of their own station. ●When the link scan for 1 station ends, I/O refreshing is performed successively on the other remote I/O stations 1 station at a time starting from station No.1 and the information of their own station is output. ●The link scan is executed twice only at the start of the loopback. This is to detect loopback errors at the 1st scan and to perform transmission at the 2nd scan as part of the loopback.
Link scan time	Time required for all the stations on the network to transmit data. The link scan time depends on data volume and the number of transient transmission requests.
Link special register (SW)	Word data that indicates the operating status and data link status of a module on a network.
Link special relay (SB)	Bit data that indicates the operating status and data link status of a module on a network.
Load cell	A sensor that converts load (force, mass, torque, etc.) to an electrical signal Also known as a load transducer. When a load is deformed by a applied load while a current is passing on the input side, an electrical signal is converted to be output.
Load inertia moment ratio	●Ratio between the inertia moment of the servo motor itself and the inertia moment of the load. ●The recommended load inertia moment ratio differs according to the type of servo motor.
Loading	Attachment of workload to each production facility by individual periods. (Or, assignment of work to individual processes.)
Local station	Cyclic and transient transmission can be performed with the master station and other local stations. The station is controlled by programs in the CPU module or other equivalent modules on the station.
Logging report function	●A function of the graphic operation terminal. ●A function for saving data collected at each data collection trigger to memory card and printing out that data in the specified format whenever required at the specified timing.
Loop	Control loop which constitutes feedback loop such as PID control.
Loop tag	A tag which has the loop control functions such as PID control, and a faceplate.
Loopback	●A means for increasing the reliability of the data link. ●This prevents the entire system from crashing if a slave station enters an abnormal state due to a power interruption, etc. or a cable malfunction occurs. ●By adopting a duplex cable configuration, communication is performed on only one positive loop when the system is normal. However, in the event of an abnormality, only normal parts of the system can be operated by using the sub loop to perform loopback communications.
Lot	"Lot" is a group of products that have been manufactured at the same time together. For example, assuming that 10 pieces of product A have been manufactured together, then those 10 pieces are referred to as a "lot." The lot size at this time is said to be 10. The unit that is ordered at a single time when placing an order for parts or the unit by which products are delivered at a single time also are called a "lot." These lots are referred to individually as production lots, order lots and delivery lots.
Lot sizing	This is a technique and process for determining the lot size. For example, the minimum quantity of a production lot is sometimes predetermined due, for example, to the circumstances of the production facilities. There are also cases where orders of parts are placed with the parts manufacturer and the minimum order quantity is predetermined. On the other hand, with MRP, the requirement is calculated to calculate the number of manufactured products and partly-finished products , and the number of ordered parts is calculated. When the calculation result is smaller than the above minimum production quantity or minimum order quantity, multiple production lots and order lots are grouped together into a single lot to increase the lot size and meet the minimum quantity requirement. "Lot sizing" is the process of increasing the minimum quantity in this way.
Low alarm/Low low alarm	Low limit alarm (PL)/low low limit alarm (LL)

用語 （Term）	解説 （Description）
LSB	●Least Significant Bit ●The lowest bit. ●The highest bit is the MSB or Most Significant Bit.
M CODE (Machine Code)	These are sub functions that interlock with the positioning operation to replace drills, tighten and loosen clamps, raise and lower welding electrodes, display various data, etc. Either of two modes can be entered when the machine code turns ON: AFTER or WITH. The machine does not move to the next positioning when the machine code is ON. M codes are turned OFF by the program. Code Nos. from 1 to 65535 assigned by the user and used (1: Clamp, 2: Loosen, etc.). Comments can be written after 50 of the M codes, and they can be monitored using GX Works2 or displayed on an external display. Refer to "AFTER MODE" and "WITH MODE".
m sec	●Millisecond. ●1/1,000th of a second ●μs stands for microsecond (or 1/1-millionth second).
Machine analyzer	●A function of the setup software for servos that automatically checks the frequency characteristics of the resonance points, etc. of a machine. ●A function for applying random excitation commands to the servo amplifier from MR Configurator2 with the servo motor joined to the machine to measure the machine's response.
Machine controller	●A device that controls each single machine on a production line. Programmable controllers are widely used as machine controllers. ●Line controllers are positioned above machine controllers, and machine controllers execute control in accordance with commands received from the line controller.
Main base	This is a building block type programmable controller, the base unit for mounting power supply modules, CPU modules, I/O modules, and intelligent modules.
Main routine program	The program that executes processing of core parts in comparison with sub-routine programs and interrupt programs.
Manchester encoding	●A type of encoding system that is used in baseband methods. ●0 and 1 are distinguished by taking the code to be (a) in the figure below when the original signal is "1" and to be (b) when it is "0".
Manifold serial transfer device	●A signal distributor that is used in combination with a multidrop link module. ●When memory areas in the multidrop link module are turned ON, this is received by the manifold serial transfer device to turn internal corresponding bits ON. ●This turns solenoid valves ON. ●When transferring bits, bits are sent successively 1 bit at a time, so transfer is by serial transfer. A feature of this unit is that much information can be sent by twisted-pair lead.
Manometer	A device which measures pressure, the following shows the representative types. Manometer is used in a process along with thermometry and hydrometry. Electric type：Resistance type,piezoelectric type Elastic type：Bourdon-tube, diaphragm, bellows type Liquid column type：U-tube, single-pipe system
MANUAL mode	In automatic control such as PID control, a mode which can be set and changed the manipulated variables (MV) by an operator manually.
Manual pulser	A unit for generating pulses by manually turning a handle.
Manual reconnection	●A method of manually operating to recover an abnormality to restore a link state after an abnormality occurs at a local station or remote I/O station on a data link and the station is disconnected from the data link. ●With MELSECNET, the link module or CPU at each station must be "RESET", and essentially the data link system must be temporarily stopped.

用語 (Term)	解説 (Description)
MAP	●Manufacturing Automation Protocol (MAP). ●A LAN implementation protocol for FA advocated by General Motors of the United States. ●A standard that determines connection and transmission (send/receive) protocols to ensure the smooth exchange of information between programmable controllers, etc. and computers made by different manufacturers and that operate using different instruction languages on production lines comprising many machines. ●Since mutual communications would not be possible if each manufacturer made arrangements for their own command language, this protocol has been standardized and made public so that each manufacturer produces unified hardware and software for MAP. The purpose of this is to relay the MAP system created in this way to link machinery in factories. ●Though this system is a factory version of a LAN, it is particularly fast and resistant to noise.
Markup language	A programming language that describes sentence structure (titles, hyperlinks, etc.) and design/layout information (font size, page composition state, etc.) in sentences by enclosing parts of documents in special code strings called "tags." Since documents written using markup language are text files, people can write to and edit them using a text editor. Typical markup languages include SGML, HTML an extended version of SGML and TeX.
Mass flowmeter	One of flowmeters which measures fluid mass. When the fluid temperature or pressure changes drastically, the density of fluid also changes, temperature/pressure correction needs to be executed against volume flow, therefore, complicated systems and accidental error factors are caused. In this case, Mass hydrometry is preferred and recently, often used. Types of mass flowmeter are such as Coriolis type which utilizes that twisting power (Coriolis force) occurred in vibrating U-tube is proportional to mass flow rate which passes through the tube and thermal type which measures temperature rise of fluid in heating.
Master station	A station that controls the entire network. This station can perform cyclic transmission and transient transmission with all stations.
Match signal	●Signal that turns ON when input matches a setting value scheduled on the high-speed counter module.
Maximum and minimum values hold function	This function retains the maximum and minimum values of the digital output values and scaling values in the module.
Maximum conversion speed	The maximum time from input of digital values or analog values up to their conversion and output.
Maximum number of links	The maximum number of devices that can be linked on MELSECNET and CC-Link IE.
Maximum resolution	The voltage or current value equivalent to digital values on A/D and D/A conversion modules.
Mbps	●Mega-Bit per second ●Expresses the 1 million unit by the number of bits per 1 second. ●10 Mbps is 10 million bits per 1 second.
MC protocol	The abbreviation for the MELSEC communication protocol, a protocol to access a CPU module from a target device in the Ethernet or serial communication.
Memory protect	●A function for preventing changes to the content of RAM memory. ●Normally, when this function is ON, the content of memory cannot be changed.
MES (Manufacturing Execution System)	An integrated manufacturing information system for managing production processes. In addition to being generally equipped with a POP or Point of Production function, MES has various production support and management functions such as process control, spot goods control, quality control, production instructions, progress management, in-factory physical distribution management, manufacturing facilities control, and maintenance management.
Microprocessor	●A downsized version of a CPU. It is also called an MPU. ●This corresponds to the nerve core of a computer system. It integrates and controls the operations of all other devices in accordance with the OS and executes arithmetic operation or logic operations on all data. ●There are 8-bit, 16-bit and 32-bit MPUs, and they come in series such as the 8085, 8086, 80286, and Z80. ●Though MPUs are also called microcomputers, a microcomputer, strictly speaking, refers to a single chip that contains a microprocessor, memory, I/O control devices, and other devices.
Minimum load current	●The minimum value at which a fixed or higher current must be allowed to pass so that a triac is powered ON. ●Also, with contacts, the minimum current must be specified for contact defects.

用語 (Term)	解説 (Description)
Mnemonic language	A programmable controller program language comprising easy-to-remember mnemonic code.
Mock-up	A model that closely resembles the external appearance of a real object. For the purpose of testing electronic equipment, housings are omitted, and for exhibits such as PDAs, there are various functions that are simulated and omitted in mock-ups depending on their intended use. For example, only housings and weight are simulated.
Moment of inertia	●A physical quantity indicating the amount that an object attempts to maintain its state at a particular time. ●The larger the value of moment of inertia, the more energy is required at acceleration/deceleration. ●It is expressed as J[x10^(-4)kg/m^2] or GD2[kgf･m^2]. ●When selecting a servo motor, ensure that the moment of inertia of the load is the recommended number of times of the moment of inertia of the servo motor or less.
Momentary stoppage	A production site term. This refers to stoppage or idling of facilities or production due to temporary trouble or vague, unclear trouble. Though it refers to short stoppages, these greatly affect production. So, reducing momentary stoppages is an important issue.
Monitoring time	●On MELSECNET and CC-Link IE, this is the time that the interval from start of the link scan up to start of the next link scan is monitored. ●When this time is set in the link parameters, communications with slave stations will be canceled when the actual time is longer than the setting value. ●When setting the monitoring time, execute a loopback test in addition to checking the actual link scan time and set a value greater than the link scan time at that time.
Monitoring trace	●A function for debugging a sequence program. ●A peripheral device is used to specify trace count, target device, sampling time, and other parameters to execute this function. ●Each time that a specified device state is monitored, data is captured to and stored on the peripheral device, and results are displayed. ●Though this is a function like sampling trace, monitoring can be performed on a peripheral device without registering the sequence program to the CPU and CPU memory is not required. ●In spite of merits such as not being influenced by the CPU scan time, monitoring precision drops.
Movement display	Repeated overwriting of the previously displayed graphic with a new graphic at a specified position to create the effect as if the graphic is continually moving.
Moving average filter	Output the average value of 'SN' pieces of input data that are sampled at data collection interval. Process FB (P_FLT) of standard filter is applied.
MRP (Material Requirements Planning)	A method or mechanism/system where parts expansion is performed on products scheduled for manufacture to calculate the total amount of parts required for production, and the total number of parts that need to be ordered is calculated by deducting effective stock quantities and stock on order from that total amount of parts.
MRP II (Manufacturing Resource Planning)	Integration of all production-related elements (e.g. personnel, facilities, funds, etc.) into material requirements planning MRP for planning and management. Though the initial letter M of MRP means "material" in this case, it is called MRP II to distinguish it from MRP above, whose initial letter M stands for "manufacturing." ERP emerged based on the concept of this MRP II.
MSB	●Most Significant Bit ●The highest bit. ●The lowest bit is the LSB or Least Significant Bit.
MSP (Management Services Provider)	A provider who is contracted to operate, monitor, maintain, or perform other services on servers or networks owned by a corporation. The MSP periodically checks the state of the system to see if it can appropriately provide services, and performs recovery work if nonconformities are found. There are also MSPs who provide services of measuring the system load and notifying the customer of information that will serve as a reference for additional investment.
MTBF	●Mean Time Between Failures ●A scale for indicating the reliability of systems. ●This expresses the average time once a fault occurs up till when the next one occurs. That is, this is the average time that a system or device operates without malfunctioning; the greater this value, the higher the reliability. ●For example, at a factory that uses 15 devices with an MTBF of 3 years, there is the possibility that 5 of these units might malfunction in 1 year.

用語 (Term)	解説 (Description)
MTO (Make to Order)	MTO is the procurement and assembly of parts from when an order is placed without holding the product or parts in stock. So, basically, there is no burden of keeping stock. Parts must be procured and assembled within the deadline, and a high-grade system of procurement/management is mandatory.
MTS (Make to Stock)	MTS is a system of predicting customers' demand and manufacturing accordingly. Though production control is less difficult, the burden of keeping products and parts in stock increases. There is also the risk of dead stock.
Multidrop link	A type of data link system that uses the RS-422 interface.
Multi-phase pulse	2A combination of two or more pulses of different phases.
Multiplex element	An element that functions to divide a single channel in a time sharing manner into multiple channels, each of which controls a single I/O device.
Multitasking	To make a computer perform multiple jobs or tasks simultaneously. By executing multiple programs in parallel, tasks on the machine body and control of peripheral devices can be executed separately.
MV	Manipulated variable
NC LANGUAGE (Numerical Control Language)	This is the language punched into the paper tape that instructs the machining to the NC module. The NC language consists of EIA codes (EIA language), ISO codes (ISO standards), and JIS codes (JIS standards).
Negative logic	●A rule where Low level voltage is taken to be ON (1) and High level voltage is taken to be OFF (0). The opposite of this is positive logic. ●Positive/negative must be stipulated in transistors and other circuits.
Nest	One method of building a program in structured programming. Nested programs are configured by bundling multiple command groups in single block units and combining those blocks into several layers. These grouped layers are called nests. Layering another nest inside another nest in several levels is called "nesting."
Node	●A nodal point on a data link. ●With MELSECNET, this is the equivalent of a station.
Noise filter	●A component for preventing the influx of external noise and for reducing generated noise. ●Installing a noise filter at a socket such as the 100V power supply of an electronic device will absorb noise. ●Though there are various types of noise filters, they are basically a combination of a capacitor and a reactor with a protruding ground terminal. Grounding this terminal increases the effectiveness of noise filtering.
Noise margin	●An indication of how much margin there is against noise. ●With two circuits, a 24V circuit and a 12V circuit for the same noise, the 24V circuit has better noise margin. ●With TTL, the presence of a voltage difference between the input and output levels is to provide noise margin.
Noise simulator	●A device for testing the level of noise that an electronic device can withstand (i.e. up to what level the device operates normally). ●A noise generator is capable of varying the voltage, amplitude, frequency and other noise parameters.
Non-procedural mode	●A communications mode that does not require special rules when performing data transactions. ●Mode in which data is sent and received in its original state.
Non-procedure	●A protocol for communicating data between two computers or between a computer and a programmable controller. ●Connection and communication can be simply performed since there is no pre-determined procedure. Basically, characters are transmitted one at a time. ●Note, however, that a mechanism that allows the user to detect errors is required since this protocol has no stipulations for error checking, etc. ●BSC and HDLC are examples of protocols with predetermined procedures. ●With these protocols, data is transmitted not one character at a time but grouped together on a frame, and error control is possible.

用語 （Term）	解説 （Description）
Normal mode noise	●Noise that is generated between two signal leads. ●For example, this is surge that is generated when an inductive load is turned OFF. On programmable controllers, this is prevented by a noise filter, and on the load side, this is prevented by a noise killer. ●Noise is led to other leads when it is carried along electrical leads to become common mode noise.
Normal station	Station that performs cyclic transmission according to the range assignment of the control station.
NRZ method	●Non-Return to Zero ●A modulation system used when transferring digital signals. ●The signal state does not return to 0 level when a 1 or 0 signal state continues. ●This system is used, for example, when recording to floppy disks.
Number of loops	The number of feedback control systems (closed-loop control systems) that can be configured using one module. Under the standard control, one loop consists of one input and one output. Under the heating-cooling control, one loop consists of one input and two outputs.
Number of occupied I/Os	●With MELSEC, I/O numbers are automatically occupied when modules are positioned on the base module. ●For I/O modules, the number of respectively held I/O points are used, and for special function modules, the number of specified points are used. ●Also, for peripheral devices excluding special function modules, an "I/O assignment" function is available that allows the number of occupied points to be ignored when assigning I/O points.
Numeric keys	Number keys from 0 to 9. An arrangement of keys exclusively for number input.
Numerical control unit	●NC stands for Numerical Control. ●A unit that controls operation of a machine tool or robot, for example, by numerical information or servo mechanism.
OCR	1. Optical Character Reader ・A device for reading text, symbols and other information, and converting this to code. ・Postal code scanner, barcode reader, etc. 2. Over Current Relay ・When a large current flows, this relay is actuated to output an alarm.
ODBC（Open Database Connectivity）	Abbreviation for Open DataBase Connectivity Standard specifications for software to access databases
OFF voltage	The voltage at which an ON is recovered (turns OFF) when the voltage of the relay coil has been gradually lowered.
Off-delay timer	●The timer that is generates a time delay until the contact is opened after the coil has turned OFF. ●When this timer turns ON, the contact is immediately actuated, and when it turns OFF, ON delay operation is performed.
Offline switch	A function for forcibly disconnecting a coil that is not to be turned ON/OFF during programmable controller operation.
Offset	●This refers to vertical movement in an input—output characteristics diagram on an A/D conversion (D/A conversion) module. ●The analog value when the digital value is 0 can be altered and adjusted. ●With an A/D conversion module, the analog input value (voltage or current) at which the digital output value becomes 0. ●With a D/A conversion module, the value that is output as analog (voltage or current) when the digital input value is 0.
ON voltage	●Voltage at which a contact is actuated when the voltage applied to a coil is raised gradually ●The ON voltage is about 70V for an AC100V coil.
On-delay operation	The operation of starting timed operation when the input signal turns ON and the output signal is output after the preset time has elapsed.
On-delay timer	●The timer that generates a time delay until the contact is actuated after the coil has turned ON. ●When it turns OFF, the contact is immediately recovered.
online change	Part of a running program can be changed without the PLC CPU being stopped.
Online module change	Modules can be changed without the system being stopped.

用語 （Term）	解説 （Description）
Online monitor	This refers to the reading and monitoring of the operating status, device content, etc. of a currently running programmable controller CPU from a peripheral device connected to the programmable controller CPU.
OPC (OLE for Process Control)	OPC, established by the OPC Foundation in the United States, is an international standards specification for unifying the interface for communicating data between applications in the FA industry. When OPC is used, programmable controllers and other FA devices can easily be connected to various client applications, and even if the manufacturer of the programmable controller used on each unit is different, client applications can be recycled with almost no modification if they are built with an OPC-compliant interface.
Open collector method	●A non-contact output method exclusively for DC where the collector on the transistor is the output terminal and the transistor functions as a contact. ●Though signals can be transmitted by a single cable, it is more susceptible to noise compared with the differential method, which makes it unsuitable for long-distance wiring.
Operation progress	Progress information from the standpoint of the facilities with respect to production instructions to the production site. This indicates what kind of operation status the facilities are in as a result of having executed the instructed production.
Optical data link, optical link	A linked system used on the data link using optical fiber cables.
Optical fiber cable	●Cable for relaying optical signals. ●Since a programmable controller runs on electric signals, the sending side converts electricity ON/OFF states to light and sends this light through optical fiber cable. ●On the receiving side, light is converted back to the original electrical states. ●Normally, two optical fibers are needed, one each for sending and receiving. ●Compared with co-axial cable, signal attenuation is less and cables are resistant to noise. Though they are capable of sending signals over long distances, they are slightly expensive. ●Materials used in optical fiber cables include glass and plastic. There are several types such as SI and GI depending on their properties.
OR operation	When expressed as a sequence circuit, parallel contacts.
Oracle	The world's largest database manufacturer. It is also the name of the relational database management system that is the mainstay product of this company. It is available for various versions of UNIX and Windows, and accounts for an extremely high share of RDMSs worldwide.
Orifice	Drosselgerate (orifice plate) which is equipped in a conduit line for measuring differential pressure which occurs before and after throttling depending on the volume of flow rate.
Origin	●The point that forms the reference in positioning.
OSI	●Open System Interconnection ●A protocol for determining common communications specifications for linking computers, programmable controllers, robots, and other equipment, and for standardizing respectively independent command languages. ●MAP is one means of doing this.
Oval gear flowmeter	A positive displacement flowmeter which measures flow rate by turning oval gears.
P operation	Proportional operation The operation that obtains the manipulated variable in proportion to deviation DV (difference between process variable and setting value)
P rate	●Pulse rate ●In positioning, a coefficient for multiplying the feedback pulse per 1 rotation of the motor shaft to 2x or 3x or dividing it to 1/2 or 1/3. ●It is the ratio of the feed pulses and feedback pulses. ●For example, if the P rate is set to 2 in the case of 2400 pulses per 1 rotation, this becomes equivalent to 1200 pulses. Though shaft rotation per 1 pulse is 0.15° at 2400 pulses, this becomes 0.3° at 1200 pulses. ●Positioning precision drops when a larger P rate is set.
P RATE (Pulse Rate)	A coefficient that magnifies the feedback pulses per motor shaft rotation by 2-fold, 3-fold, 1/2 or 1/3. It is the ratio of the feed pulses and feedback pulses. For example, when the No. of pulses per motor shaft rotation is set to 2400 pulses, and the P
P&I flow chart	Piping and instrumentation flow chart which shows entire control system and describes such as piping, detector, final control element, controller in symbols.

用語 (Term)	解説 (Description)
Parallel off	●On a data link, exiting from the data link by a local station or remote I/O station so that it no longer operates when a station becomes abnormal on the data link. ●When returning the station to its original operation after the abnormality is recovered, it is automatically incorporated into the link if automatic connection is set.
Parallel transmission, parallel interface	●The transmission of many bits of data simultaneously in parallel when transferring data as binary numbers (0, 1). ●8 electrical leads are required to send 8 bits. ●The GP-IB and printer Centronics interface operate by parallel transmission.
PC MIX value	●The mean number of instructions that can be executed in 1 μs on a programmable controller when sequence instructions or basic application instructions are combined in a certain ratio. ●The higher the value, the faster processing becomes.
PDM (Product Data Management)	A data system that centrally manages complex and large volumes of data from product planning, development and design through to production, sales and maintenance in order to improve process efficiency and shorten processing times.
Pegging	One of the functions of an MRP. This refers to linking which product (partly-finished product) orders parts or materials are assigned to, and specifying product orders from part manufacturing/purchasing orders. There are two types of pegging, single pegging and full pegging. Single pegging shows only direct new orders for that part, while full pegging links between orders at many stages from parts through partly-finished products, and, moreover, up to that parent, the final product order. This is used to learn, for example, which product's manufacture will be affected when supplies of parts are late.
Photoelectric switch	●A unit that irradiates light rays to detect the presence of objects. ●A photoelectric switch operates as follows. "Light", such as visible light and infrared rays, is discharged as signal light from a light emitter, and the light reflected by the detection object is detected by the light sensor (reflection type), or changes in the amount of light blocked are detected by the light sensor (transmission type, retro-reflection type) to obtain an output signal. ●These switches operate by non-contact detection, and can detect almost all objects (glass, metal, plastic, wood, liquid, etc.). ●Since they have a long detection distance (transmission type: approx. 10 m, reflection type: approx. 1 m, retro-reflection type: approx. 50 m) and response is high (max. approx. 20μs), they are used in a wide range of fields. ●Some switches can distinguish color.
PID constants	A generic term for the proportional band (P), integral time (I), and derivative time (D)
PID control	●A type of control used for instrument control that enables 3 actions, Proportional, Integral and Derivative. ●PID control is used for controlling temperature, flow rate, speed, mixture, and other controlled process values. ●Exclusive programmable controller modules are available for PID control and PID control programs are made separately.
PID operation	This is the control operation which operates and outputs the manipulated variable (MV) to have the process variable (PV) approach the setting value (SV) rapidly and correctly by combining P control action, I control action and D control action. Besides, if P, I, D operation are not all included in the control, it is called P control or PI control according to the control action included. PI operation is mainly for flow rate control, pressure control, temperature control. PID operation is mainly for temperature control.
Plastic fiber	●Optical fiber cable with a core made of plastic. ●It is thicker than glass fiber (dia. approx. 1 mm) and has a short transmission distance, but it is cheap. ●It is used for MELSECNET/MINI.
PLM (Product Lifecycle Management)	A means of comprehensively managing "all processes throughout the product lifecycle" from the product development and planning stage through to design, procurement, manufacture, sales, customer service, and disposal. An assertion of PLM regarding PDM is that product and part data must be retained through the product's lifecycle. PLM is almost synonymous with PDM except that the scope of the product simply is not stated.
Polling	This refers to periodically going to look for a device or program. With communications equipment or devices, this term is sometimes used to indicate checking whether or not there is a queue when multiple devices are operating in collaboration. This technique is often used to run multiple devices using 1 channel.

用語 (Term)	解説 (Description)
POP	●Point of Production. ●A system where an ID plate, barcode reader or other device is used to grasp production information in a timely manner at each point in the production process so that the flow of goods and information is merged. ●The information obtained is put to use in various ways in process progress and inventory management in production control.
POP before SMTP	One type of authorization method specified when sending e-mail. By accessing the specified POP3 server in advance before sending an e-mail, this method grants permission to use the SMTP server.
Position control	●This is control that mainly uses position or dimensions (e.g. constant rate feed, positioning, numerical control). Control is performed by feed pulse at all times.
Position control gain	●The ratio of specified pulse frequency to the accumulated error pulse in an error counter in positioning operations. ●Improving stop precision increases gain, however increasing gain excessively results in overshoot (overtravel). ●Excessively lowering gain results in smoother stops, however, stop error increases.
Position control mode	●A servo control mode in positioning operations. ●Other servo control modes include speed control mode in which speed control is performed and torque control mode in which torque control (current control) is performed.
Position detection module	●A simple version of positioning. ●On MELSEC, the A61LS and A62LS are available. ●Positioning and limit switch functions are provided, for which a total of 16 channels can be used.
Position detection unit	●On a positioning module, this is the feed amount per 1 pulse. ●1 rotation of the motor shaft is converted to pulses to express the feed amount per 1 pulse. ●On a stepping motor, this is the feed amount per 1 pulse of the feed pulse. ●On a servo motor, this is equivalent to 1 pulse of the feedback pulse. ●On MELSEC-AD71, the range is 0.1 to 10.0 μm.
Position type PID control	Position type PID control is an operational method to find manipulated variable (MV) from the difference (deviation) between PID operational method setting value (SV) and process variable (PV). On the other hand, velocity type PID Control is an operational method to find a change volume of manipulated variable (ΔMV) from deviation.
Positioning	●Movement from a certain point to the next predetermined point. ●A servo motor or stepping motor are used as a positioning module for outputting position instructions and as the power.
Positioning completion signal	●Signal that is generated when the positioning dwell time ends. ●The preset timer starts at this time. ●The purpose of generation of this signal is to start other post-positioning operations (e.g. clamping).
Positioning data	●Data for positioning performed by the user. ●The number of points (number of addresses) to perform positioning on is specified based on parameters.
Positioning parameters	●The basic data for performing positioning control that includes data such as control unit, travel amount per 1 pulse, speed limit value, high/low stroke limit values, acceleration/deceleration time, and positioning method. ●Defaults are provided for parameters, so change their values to match control conditions.
Positioning pattern	Rules for specifying the operation to perform next after positioning ends.
Positioning start	●Start of positioning from a specified target positioning start No.
Positive logic	A rule where High level voltage is taken to be ON (1) and Low level voltage is taken to be OFF (0).
Positive loop	●Of the duplex loops, the loop on which communications is being performed normally for MELSECNET loopback. It is abbreviated as F.LOOP. ●If an abnormality occurs on the positive loop, the other sub loop is used. ●It is also the name of connectors for the optical fiber cable or co-axial cable on a link module. The side marked OUT is the positive loop sending side, and the side marked IN is the positive loop receiving side. ●The same cable type is used for the positive loop and sub loop.

用語 (Term)	解説 (Description)
Power rate	The rate of power increase that the servo motor can output. In the case of motors of the same capacity, trackability of acceleration/deceleration commands increases the larger the power rate becomes.
Power supply equipment capacity	●The capacity of the power supply required for devices using servos and inverters. A capacity sufficient for preventing the power supply voltage to drop even if a large load is applied is required. ●The power supply equipment capacity required for multi-axis machines changes according to the operation pattern.
Power-factor improvement reactor	A device for improving the power factor of an inverter or servo amplifier. Use of this device can reduce ripple in the power supply waveform and decrease the power source capacity.
PPS	●Pulse Per Second. Number of pulses per 1 second. ●kpps is 1,000 pulses/ second (kilo pps) ●Mpps is 1 million pulses/ second (mega pps).
Preset	Rewriting of the current values to specified defaults.
Preset counter	●A counter that sets a count value (normally, 0) for starting the count from and operation count values in advance, and using these values for counting. ●When the count reaches the operation count value, ON and OFF signals are output. The count value is set to 0 by the reset signal. ●Preset values other than 0 also are possible.
Pressure bias	Temperature/pressure correction operation is executed with absolute unit (absolute temperature, absolute pressure). Pressure bias is the correction values for converting design pressure/measured pressure to absolute pressure.
Process control	To adjust or control the variables which influence the operation status of industrial processes to meet the specified setting value.
Program capacity	●The total capacity of the sequence program and microcomputer program areas. ●The capacity of the sequence program indicates the maximum number of steps (program size) that can be stored in memory in K step units. ●1K steps means 1024 steps. ●The capacity of the microcomputer program indicates the maximum number of Kbytes (microcomputer program size) that can be stored in memory in Kbyte units. ●1Kbytes means 1024 bytes. ●Microcomputer programs cannot be used on some models depending on CPU.
Program Control	It is a control method to change the setting value by the pre-set program. It is used for such as temperature control. It needs to combine the program setter and PID control for using.
Program memory	This memory stores programs and parameters required in processing of the CPU module.
Programming tool	A generic term for GX Works2 and GX Developer
Project	A project is a generic term for data (such as programs and parameters) to be executed in a programmable controller CPU.
Proportional band	In proportional activity, input variation range (%) against the change of output effective variation range from 0% to 100%. For PLC, proportional gain Kp is applied, not proportional band. 100/Proportional gain Kp = Proportional band
Protocol	A collection of rules predetermined between two parties in communications between two computers over a network. It is also called communication procedures.
Proximity dog	●A switch placed in front of the origin in zero return. ●When a proximity dog turns ON, the feed speed is switched to creep speed. ●For this reason, the time that a proximity dog is ON must be the time that feed speed decelerates to creep speed or longer.
Proximity switch	●A switch that is actuated when an object approaches it. ●Often proximity switches are actuated contactlessly and often are non-contact type, so they are often used as inputs for programmable controllers. ●They adopt a method of using radio waves and magnetism to detect objects.

用語 (Term)	解説 (Description)
PTP	●Point To Point Control. ●Control where pass points on a route along which positioning is executed are designated in a stepped manner.
Pulse catch function	A function for capturing short pulses (having a minimum width of 0.5 ms) that cannot be caught on regular input modules.
Pulse generator	●A device that generates pulses. ●For example, it is attached to a motor shaft to create pulses by rotation of the shaft. ●In the case of a 1-phase system, 1 pulse train is output, and in the case of a 2-phase system, 2 pulse trains with a phase differences are output. ●The number of pulses per 1 rotation of a shaft is 600 to 1,000,000 pulses. ●Devices with a zero signal also have a function for outputting 1 or 2 pulses per 1 rotation of a shaft.
Pulse input module	Input module which counts metric pulse signal from flowmeter.
Pulse output mode	There are two forward rotation/reverse rotation command modes for when commands are issued to the positioning module. These differ according to the manufacturer.
Pulse, pulse train	●A position command method that can be accepted by a servo amplifier. An H/L level rectangular wave. ●There are three types of methods, forward rotation/ reverse rotation pulse train, pulse train + rotation direction and A-phase /B-phase pulse train, each with positive and negative logic.
PV	Process variable
Queue	A type of data structure whose feature is that data that is input first is output first. As a computer term, a queue refers to a mechanism, as in a print queue, where data is processed beginning with the data that arrived first. Opposite of a queue is a stack, a data structure where data that is input last is output first.
R/3	An ERP package made by the German software company SAP. Installed in over 10,000 of the world's major corporations, this is a pioneering product in this sector and boasts the world's largest share. The structure of R/3 is a 3-tier client server system comprising a database, application and presentation (clients) tiers, and it is in an open specification in which each of these tiers is not reliant on hardware or the OS. It is also equipped with a programming interface called BAPI (Business API) which allows expanded functions to be flexibly added on.
RAM	●Random Access Memory ●Memory that can be read or written to whenever required. ●RAM includes DRAM and SRAM.
Ramp action	The operating status of when the set value (SV) is constantly changed
RAS	Abbreviation for Reliability, Availability, and Serviceability. This term is used to express the overall usability of automation systems.
Rate of Operation	The rate of demand with respect to periodic capacity when facilities have been fully operated at their capacity to process the production volume required for post processes (tied to sales).
Rated load	Maximum load that can be applied to a load cell Tare weight is included in weighing.
Ratio Control	This control holds the proportional relation between more than 2 variables, such as a control that SV changes in a constant ratio to other variables. (Example) Air-fuel ratio control
Ratio metric method	A method for proportionating the reference voltage for an A/D converter to the variation in an input signal of a load cell Errors can be minimized by using the same power supply to the reference voltage for an A/D converter and the voltage to be applied to the load cell.
Realtime report function	●A function of the graphic operation terminal. ●A function for printing out data collected at each data collection trigger in the specified format whenever required.
Reception level	Value indicating the assurance level of optical power on the receiving side of the data link.
Reconnection	Processing of restarting data link when a faulty station becomes normal.

用語 (Term)	解説 (Description)
Record	Corresponds to a row in a relational database. One row (Record) stores the values of multiple columns (Fields).
Reduction ratio	●The ratio when deceleration is performed using gears by a positioning module, for example. ●The reduction ratio will be a number greater than 1.
Reed switch, reed relay	●A device for switching low voltages and small current that is actuated by magnetism. ●The contacts of this device are sealed inside a glass tube filled with inert gas to shut out outside air. ●The contacts are attached to a magnetic body, and are mutually attracted to contact each other if magnetism is applied from outside the glass tube. ●Contact reliability is extremely good.
Refresh method	●A method of processing programmable controller inputs and outputs, in contrast to the direct method. ●The refresh method operates as follows. Input X and output Y ON/OFF states are captured before scanning, the program is then scanned, and during a single scan, the ON/OFF states are not captured even if X and Y turn ON/OFF. ●The direct method differs in that X and Y ON/OFF states are captured during scanning. This is also called the batch input/output method. ●Though X and Y action may feel slower by the refresh method than the direct method, the overall delay with the refresh method is smaller than that of the direct method since the command processing time is small.
Regenerative brake	●Normally, to move the machine by motor, power is supplied to the motor from the amplifier. Whereas, to decrease the machine speed, for example, at motor deceleration or when driving a lowering load, braking force is obtained by allowing the rotational energy of the motor and machine escape to the amplifier side (i.e. be consumed). This is called the "regenerative brake." "Allowable regenerative electric power" refers to the maximum energy that can be consumed by regenerative brake operation. ●For example, on the MR-J3 servo amplifier, regenerative energy is consumed by capacitors and resistors to obtain the regenerative brake torque. ●When large regenerative energy must be consumed, a resistive circuit (external regeneration resistor) is provided outside the servo amplifier and the energy is consumed there.
Regenerative load factor	Ratio of regenerative electric power to allowable regenerative electric power.
Regenerative resistor	●Resistor used for the regenerative brake. ●Regenerative energy is consumed as heat.
Register	Memory for temporarily storing information. Information can be continually replaced in this memory.
Relay station	●A station that has no functions as a slave station on the data link and functions only to simply relay information. ●Stations can be connected up to 1 km in the case of optical fiber cable and up to 500 m in the case of co-axial cable. This station is used, for example, to extend this distance. ●It is only a CPU , and may have no I/O module.
Relay symbol language	●A sequence language itself based on coils and contacts. ●Ladder diagram.
Remote device station	A station that exchanges I/O signals (bit data) and I/O data (word data) with the master station by cyclic transmission. This station responds to a transient transmission request from another station.
Remote I/O station	A station that exchanges I/O signals (bit data) with the master station by cyclic transmission
Remote input (RX)	Bit data input from a slave station to the master station (For some areas in a local station, data are input in the opposite direction.)
Remote input (RY)	Bit data output from the master station to a slave station (For some areas in a local station, data are output in the opposite direction.)
Remote Operation	Remotely control RUN/PAUSE/STOP of the programmable controller CPU from a programming tool of MELSEC.
Remote Password	Remote Password is to prevent illegal access from remote users to a programmable controller CPU.

用語 (Term)	解説 (Description)
Remote register (RWr)	Word data input from a slave station to the master station (For some areas in a local station, data are input in the opposite direction.)
Remote register (RWw)	Word data output from the master station to a slave station (For some areas in a local station, data are output in the opposite direction.)
Remote RUN	To RUN-STOP the programmable controller from a remote location.
Remote sensing method	A method for stabilizing an applied voltage value near the load cell Variation in the applied voltage occurs by a change of a cable resistance value resulted from temperature change. Connecting two remote sensings on the device applying a voltage stabilizes the applied voltage value.
Reserved station	Station that is not actually connected to the network. It must be included in the total number of stations in the network, since it is to be connected in the future.
Reset Windup	Reset windup is a problem that deviation is accumulated continuously when an integral element exceeds saturation limit in the case of excessive deviation. Also called Integral windup. In order to reset the value to the high/low limit value when MV exceeds high/low limit, and to response immediately when the deviation is inverted, a measure against reset windup needs to be implemented to stop the integral action toward the exceeded direction when the value is exceeded the specific limit. (Bold line in the diagram below) A measure against reset windup is implemented for QnPHCPU, and QnPRHCPU.
Resistance temperature detector	●Electrical temperature sensor. ●Platinum is used in this sensor, and resistance value is converted to temperature by using changes in the resistance of the platinum caused by temperature. ●It is stipulated in JISC1604. ●Pt100 refers to a sensor having a resistance of 100Ω at 0℃, and is used with one of AC 2mA, 5mA and 10mA. ●There are many types of sensor depending on the temperature to be measured.
Resistive load	●A load having resistance only, such as an incandescent light bulb. In terms of AC, a load having a power factor of 1, and in terms of DC, a load having a constant of 0. Note, however, that incandescent light bulbs have a rush current when they are turned ON. ●The voltage and current rating of output modules are often indicated based on the resistive load. ●A rush current is present when inductive loads or capacitor loads, for example, are turned ON, so derating is required.
Resolution	An indication of how many numbers an analog amount in a certain range can be resolved to.
Resolver	●A device for resolving detected degrees of rotation into 2 voltages. ●It is also called a 2-phase synchro. This converts one rotation of the rotation angle of a shaft with respect to a 1-phase voltage input to right-angled 2-phase voltage (analog voltage) which is then output.
Response time	●Delay time from when an input device turns ON up to when input X in the program turns ON. ●Likewise, a delay time is also generated when input turns OFF. ●The delay time from when the program coil is switched ON/OFF for output Y up to when the output contact (or triac, transistor) turns ON/OFF.
Retooling	This refers to performing machine adjustments and replacing the tool to machine with to ensure that a wide variety of workpieces are processed under ideal conditions.
Reverse action	In PID control, an activity to increase manipulated variable (MV) against decrease of process variable (PV) compared to setting value (SV). (Example: heater)
RFB limiter	The RFB (Reset feed back) limiter suppresses overshoot which is liable to occur at a startup or when a temperature process value (PV) is increased.

用語 （Term）	解説 （Description）
RF-ID tag/IC tag	An IC chip, normally equipped with wireless communications functions, that is used for identification of commodities and goods, for example. To ensure wider use of this chip on the market, compatibility between a wireless system and its frequency (Radio Frequency = RF) and identification (Identification = ID) system must be secured. As a result, standardization of these chips is being promoted. These chips are also called IC tags. Compared with barcodes, large volumes of data can be read/written (i.e. additionally written) in a contactless manner. In addition, they are reusable, so are in the process of being applied to product control by being attached to machined parts, etc. at production sites and being written in real time with machining conditions, inspection results and other information.
RFP (Request For Proposal)	A document describing a summary of an installation system or procurement conditions to be provided to a vendor by the user who desires delivery of an information system.
RGB	●Terminal for color CRT. ●RGB stands for the three primary color signals: R for Red, G for Green and B for Blue. Each color is synthesized by mixing each of these signals.
Ring counter	This counter outputs a signal as well as automatically being preset when the counter advances and reaches the setting value.
Ripple	●The ratio that a wave is formed at DC voltage. Ideally, this should be 0. ●Large ripples cause erroneous operation.
Rise time	●Time until a signal turns ON and completely stabilizes. ●When counting a pulse, the moment in time that counting is started becomes a problem when the pulse rises slowly. ●This occurs, for example, because of long wiring distances.
RLS SIGNAL (reverse limit signal)	This is the input signal that notifies the user that the limit switch (b contact configuration, normally ON) installed at the lower limit of the positioning control enabled range is activated. The positioning operation stops when the RLS signal turns OFF
Rollback	Processing for canceling changes to a database
ROM	●Read Only Memory ●A type of read-only memory. ROM includes EP-ROM and EEP-ROM.
Routing function	●On multi-layer systems such as MELSECNET/10, H, CC-Link IE, and Ethernet, a function for transmitting data to a station in another network from a station on a certain network. ●To execute this function, routing parameters must be set at the requestor station and relay station.
RS-232C interface	●RS-232C is a standard determined by the Electronic Industries Association (EIA) of the United States. ●It defines the dimensions, names, signal timing, etc. of the 25 pins of the connector. ●The standard for communicating binary data between two connected electronic devices is JIS X 5101. ●RS-232C can perform communications in a 1:1 configuration, such as between a computer and a programmable controller. ●The interface cable is limited to 15 m because it is susceptible to noise. ●At 20 KBPS, its maximum communications speed is slow. ●The interface is sometimes called a "port" so it is also generally called the "serial port."
RS-422 interface	●A standard determined by the Electronic Industries Association (EIA). ●Although it is like RS-232C, communications can be performed in a 1:n configuration (where, n = 1 to 32), and its maximum cable extended length is 500 m. ●It uses differential signaling, which makes it resistant to noise, and it has a lower amplitude voltage (±2 to 5V) than RS-232C. ●The maximum communications speed is 29 KBPS. ●The configuration for communicating with multiple stations is also called "multidrop." ●RS-422 is used in industrial products where reliability is required and in applications where a fast communications speed or long communications range is required.
RS-485	●An interface standard for serial transmission. ●This interface allows up to 32 drivers and receivers to be connected. ●It supports a maximum transmission range of 1200 m, though this changes depending on the transmission speed. (10 Mbps: 12 m, 1 Mbps: 120 m, 100 Kbps: 1200 m). ●It is more resistant to noise than RS-232C, enabling high-speed transmission.
Rush current	●An excessive current about 5 to 6 times the rated current that flows when a power supply is applied to a motor. ●A large current that flows to charge a smoothing capacitor when an inverter or servo is turned ON.

用語 （Term）	解説 （Description）
RZ method	●Return Zero. ●A modulation system used when transferring digital signals. ●A 1 state signal is returned once to 0.
Sample PI Control	When PID control is applied on a system whose dead time is long, MV will be continuously updated before MV effect is confirmed. Sample PI control executes only for a control cycle in every control cycle, and then holds the output after that.
Sampling counter function	A function for counting the number of pulses input during the preset sampling time after when the counter function select start instruction signal is input, and storing this number in buffer memory.
Sampling processing	The A/D conversion for analog input values is performed successively, and the digital output value is output upon each conversion. The value is stored in buffer memory.
Sampling trace	●A function for making bugs in programmable controller programs or nonconformities on the machine easier to find. ●The ON/OFF states or data of specific devices are stored to memory for the specified number of scans, and this information can be monitored later on a peripheral device. ●In addition to the scan count, the time interval also can be specified.
SAP	The world's largest software company in the ERP market. It is also a solutions vendor providing various services primarily around its own software. The company's ERP package "R/3" is installed at over 10,000 of the world's major corporations.
SCADA (Supervisory Control and Data Acquisition)	The SCADA software tool is a measurement data control and monitoring system. It features distributed monitoring control and this can be built on a computer. Up till now, monitoring control systems were incorporated into expensive hardware and were also troublesome to maintain. Whereas, use of SCADA software allows control items or monitoring data items to be selected as desired. Screens also can be freely designed. Moreover, an attractive point of this software is that it can be built by the end user her/himself without having to rely on outside specialists.
Scaling function	Digital output values can be converted to scaling values (ratio (%)) and the converted values can be stored into buffer memory. In D/A conversion, an input range of digital input values can be changed to a setting range and the analog output can be performed.
Scan Time	A CPU module sequentially performs the following processing in the RUN status. Scan time is the time required for all processing and executions to be performed. - Refresh processing - Program operation - END processing
Schema	Generally, this is a description of a database that is executed using the definition language of a DBMS. A schema in XML describes the structure by which XML documents can be obtained. In other words, it means a clear definition in computer language of whether elements and attribute arrangements are arranged correctly or incorrectly.
Schema language	A language that defines the structure when creating documents in SGML or XML. A language for describing schema.
SCM (Supply Chain Management)	A management concept of integrating and managing the supply chain from parts/materials manufacturers and product manufacturers through to wholesale and retail with a view to eliminating waste and reducing costs. SCM viewed from a retail standpoint is also called DCM (Demand Chain Management). In terms of content, they are both the same.
SCP (Supply Chain Planning)	The formulation of business schedules from the standpoint of production and distribution based on predictions and actual demand.
S-CURVE ACCELERATION/DECELERATION	In this pattern, the acceleration and deceleration follow a sine curve, and the movement is smooth. The S-curve ratio can be set from 1 to 100%.
Seamless	The integrated use of two or more services by a user without any sense of incongruity. This means the lowering of hurdles between multiple services so that the user can use these multiple services as if he is using the same service.
Secondary loop	Secondary loop of cascade control
Segment length	The length between both ends of a bus communications path such as 10BSE5.

用語 （Term）	解説 （Description）
Select refresh	Select refresh is used to perform I/O refresh at any timing during execution of a sequence program by using COM or CCOM instruction.
Self diagnostics	●A function where a programmable controller CPU detects abnormalities on the CPU itself. ●The self diagnostics function outputs warnings for memory errors, watchdog timers, battery voltage errors, and other abnormalities.
Semi-graphic	Using prepared patterns to draw when drawing figures on screen.
Sequential Function Chart	●A type of sequence language standardized by IEC. ●A programming language for control specifications that enables the overall configuration to be ascertained and the execution sequence and execution conditions of the program to be clarified. It achieves this by expressing the series of control operations as a block diagram that resembles a flowchart.
Serial number access method	In the serial number access method, specify the file registers beyond 32k points with consecutive device numbers. The file registers of multiple blocks can be used as consecutive file registers. Use "ZR" as the device name.
Serial transmission, serial interface	●A method where data is transferred on a single electric lead in order (in series) 1 bit at a time when data is sent as binary numbers (0, 1).
Server computer	There are database server computers and application server computers. The database server computer is a personal computer with a relational database which links information with the MES interface module. The application server computer is a personal computer with a program that operates upon request from the MES interface module.
Service processing time	Service processing is the communication processing with a programming tool and external devices.
Servo amplifier	A control device for rotating the servo motor as instructed by instructions from a host device such as programmable controller, positioning module or motion controller.
Servo motor	●A motor that rotates exactly as instructed according to instructions. ●Servo motors have a high response, and can start and stop at high speed, precision and frequency. ●There are DC and AC servo motors, and large-capacity motors are possible. ●They are often equipped with an encoder for detecting position and can perform feedback control.
Servo parameters	●This data is determined according to the specifications of the connected servo motor and the control method of the machine, and is set for each axis. ●Defaults are provided for parameters, so change their values to match axis control conditions.
SFA (Sales Force Automation)	The utilization of information communications technology, such as computers and the Internet, to improve the efficiency of corporations' sales departments. Or, an information system for that purpose.
SFC (Sequential Function Chart)	A sequential function chart is a programming method optimally structured for running a machine's automatic control in sequence with the programmable controller.
SGML (Standard Generalized Markup Language)	A general-purpose metalanguage and markup language. Basically, it is easier to understand XML as being the result of removing frequently used functions from SGML and reworking it to be more manageable. Also, HTML is one of the languages created using SGML. Functions that are non-existent in SGML are often stipulated in XML. For this reason, it is correct to view XML as a new-age language replacement for SGML. It is expected that SGML will be sequentially replaced by XML and eventually disappear.
Shared group No.	Number that is assigned to a station to allow it to share cyclic data with any given stations. Cyclic data can be shared only with stations of the same group.
Shell	Software that conveys given instructions to the core part of an OS in response to user operations. Text input from a keyboard or mouse clicks and other operations are interpreted to relay instructions to the OS so that the corresponding function is executed. In Windows, the Explorer or the command prompt, in the Mac OS, the Finder and in UNIX-based OSs, bash or csh, respectively correspond to the shell.
Shielded cable	Electrical lead grouping together several leads for communications that are covered in shielding to prevent noise.

S

用語 （Term）	解説 （Description）
Shifting function	In A/D conversion, a given value is added to an A/D converted digital output value. In D/A conversion, a given value is added to a digital input value and an analog value is output. Changing a shifting quantity reflects the output value in real time. Therefore, the output value can be adjusted with the shifting function when the CPU is powered on.
SI	●Step Index Fiver ●Step index, a type of optical fiber. ●The diffraction index of the fiber core is uniform, and signal distortion due to the incident angle of light is large. ●It is used for MELSECNET.
SI (System Integrator)	A vendor who analyzes a customer's business operations and undertakes all work such as the planning, building and operation of an information system best suited to solve customer problems. An SI conducts everything from planning/origination of the system, development of programs, selection/installation of the required hardware/software, to maintenance/management of the completed system.
Sign bit	●Bit that appends a sign to indicate whether memory content is plus or minus. ●The basic rule is, when the most significant bit of 16 bits is 0, content is a plus number, and when it is 1, it is a minus number. ●Accordingly, 15 of 16 bits can be used for numerical values.
Simultaneous temperature rise	Temperatures of multiple loops can be adjusted to simultaneously reach the set value of each; temperatures are controlled evenly without any partial heat exaggeration. This function saves energy and cost.
Slave axis	The side where positioning data is partially ignored during interpolation operation by a positioning module.
Slave station	●A local station or remote I/O station on the MELSECNET data link. ●Slave stations are in a parent-child relationship with a master station.
Slave station	A generic term for stations other than a master station: local station, remote I/O station, remote device station, and intelligent device station
SMTP-Auth	One type of authorization method specified when sending e-mail. The user's account and password are authenticated between the SMTP server and user, and this method only sends e-mail if authenticated.
SNTP (Simple Network Time Protocol)	Protocol for synchronizing computer time over a TCP/IP network, a simplified version of NTP. The NTP protocol hierarchically configures a time information server and exchanges information to synchronize time. SNTP is NTP but with the complicated part of its specifications omitted, and is dedicated to applications where clients issue inquiries about the exact time to the server.
SOA (Service Oriented Architecture) NEW!	A method, in various business systems, of collaboratively using individual applications to integrate them into a large-scale system.
Software counter	Counter configured in the programmable controller's program.
Software timer	Timer configured in the programmable controller's program.
Solenoid	●A DC or AC electromagnet connected to the output side of a programmable controller. ●Since it is a coil, surge is generated when it is turned OFF, so a surge killer should be connected in parallel in the proximity of the solenoid valve. ●Provide extra margin in a solenoid's output capacity since rush current is present in the case of an AC power supply. ●Solenoids are used as apparatus for turning hydraulic and pneumatic valves ON and OFF when performing push and pull operations on a machine. ●A solenoid with an integrated oil or air switching valve is called a solenoid valve.
Solid-state	This refers to a unit configured by semiconductors, and has no mechanically wearing parts.
Solution	Information processing or communications technology is used to solve business issues confronted by companies. This term is mainly used by software developers who receive orders for customer management, e-commerce and supply chain management systems.
Source / Destination	Source is the data used for operations. The destination stores the data after the operation has been conducted.

用語 （Term）	解説 （Description）
Source load, source type	●An input/output type for DC using transistors ●With source input, when input turns ON, power is supplied to the input module. ●Because the plus side is the common lead, the input terminal does not turn ON in the event of an accident even if it is grounded. It is also called a voltage input, and is often used in Europe. ●With source input, a source output or a highly reliable contact is connected.
SPC/SQC (Statistical Process (Quality) Control)	A production process control technique where statistical methods (e.g. control charts) are used to process and analyze vast amounts of data relating to production and quality that is collected various checkpoints in production processes, so that products can be manufactured with consistent quality.
Special instruction	Generic term for module dedicated instructions, PID control instructions, socket communication function instructions, built-in I/O function instructions, and data logging function instructions
Speed frequency response	●The maximum frequency at which a motor can keep up with instructions when a sine wave instruction is issued to the motor. ●Frequency with a gain of -3db with respect to the amplitude of the instruction.
Sprite display	This refers to the display of any changing numerical value, text string, graphic, or other display element in accordance with programmable controller device data or program designations.
SQL (Structured Query Language)	A language developed by IBM for operating relational databases. A world-class standard standardized by the American National Standards Institute (ANSI) and JIS.
Square Root Extraction	√‾ (root) calculation function. When measuring flow rate through differential pressure of orifice or venturi tube, the signal which is obtained from sensor has square characteristics. This control linearizes the signals. Process FB "P_SQR" is applied to this function.
SRAM	●Static Random Access Memory ●A type of RAM widely used in programmable controllers since it has small holding power (battery backup). ●SRAM is also used as MELSEC user memory.
SSR	●Solid State Relay ●A non-contact switch that mainly uses a triac to turn current ON/OFF. ●It is long-life since it never wears down. ●Non-contact output exclusively for AC.
ST Program（structure text program）	ST programs are described in ST language.
Stabilized power supply	●Fixed DC voltage power supply. ●This power supply can output DC of fixed voltage when AC power is supplied. ●Stabilized power supplies are used for MELSEC power modules.
Stack	A type of data structure whose feature is that data that is input last is output first. Opposite to that of a stack, a data structure where data that is input first is output first is called a "queue" (pushup list).
Standard data/standard data management	"Standard data" is a physical amount per single unit. For example, assuming that 50,000 products are manufactured at certain production facilities, and the energy consumption of those facilities is 10,000,000 kcal, the energy standard data is calculated as 10,000,000 kcal / 50,000 items = 200 kcal / item. Management of production, for example, using the number of the standard data is called "standard data management."
Standard RAM	The memory built in the CPU module. This memory stores file register files, local device files, sampling trace files, and module error collection files.
Standard ROM	The memory built in the CPU module. This memory stores data such as device comments and PLC user data.
Standardized signal	An input/output process control signal (such as process variable signal or operation signal) whose range is standardized. Even in a minimum process variable limit, a failure or a disconnection of transmitter or converter can be detected by applying 4mA current.
Start bias speed	In positioning, large torque is required when the machine starts to be moved. However, with a stepping motor, since torque at speed 0 is sometimes unstable, machine startup can be made smoother if movement is started at a certain speed from the beginning. This is the speed that is set at this start.

用語 (Term)	解説 (Description)
Start completed	A signal that is issued by the positioning module where start was applied to indicate that positioning was started normally.
Start/stop synchronization method	●When data is sent, transactions must be performed with timing matched on the sending and receiving sides. This is called "synchronizing." ●Start/stop synchronization adopts a method where synchronization is performed one character at a time. At this time, one character is prefixed with a start bit that is sent as the start code and is appended with a stop bit to indicate the end of the data. ●Start/stop synchronization method is also used in both bit synchronization and frame synchronization.
Station, station No.	●Each single programmable controller that is connected on MELSECNET and CC-Link IE is called a station. ●Each of these stations is appended with a No. for management, which is called a "station No."
Status latch	●A storage function for all devices that makes bugs in programs or nonconformities on the machine easier to find. ●A peripheral device is used to store the ON/OFF states and data of all devices obtained by 1 scan to memory so that they can be monitored later. ●Though all devices can be viewed, memory storage is limited to states and data obtained in only 1 scan.
Status tag	A tag which contains a faceplate with the ON/OFF control function such as start/stop of electric motor or open/close of solenoid valve.
Step	●A unit of sequence program size. ●1 step = 2 bytes or 4 bytes. 1k step = 1024 steps. ●Step numbers are appended to the sequence program in the order of program execution. ●1 step is assigned to both 1 contact and 1 coil. ●With some commands, several steps are programmed for a single command. ●The CPU executes operations in the step number order.
Step operation	Generally, programmable controller operation is executed at high speed. This function, however, allows the programmable controller program to be executed at individual steps so that the execution state of the program and content of each device can be verified.
Step out	●Stepping motors rotate proportionately to the number of pulses (frequency), however, when the load placed on the motor is excessive, rotation cannot keep up that load and rotation becomes out of step. This is step out. To prevent this, a motor with a larger torque must be selected. ●When there is step out, positioning error increases.
Step run	A function for making programmable controller debugging and test running easier.
STL (Standard Template Library)	A C++ language standard template library. This library groups general-purpose data structures and algorithms that are frequently used when programming in C++. STL has an extremely high degree of freedom and is said to have good performance. Due to its being adopted as standard, many processing systems are implemented, and use of STL can improve portability.
STN liquid crystal display	●STN: Super Twisted Nematic ●A type of LCD that uses a simple matrix system where liquid crystals are enclosed in between numerous horizontally and vertically arranged transparent electrodes, and by application of a signal voltage to those electrodes the liquid crystal matrix state of those intersecting points is controlled to perform display. ●Pixels are turned ON/OFF by twisting and aligning liquid crystal molecules.
Stock turnover factor	The turnover rate (shipping sum divided by stock sum) is calculated for each commodity, and is used for judging superiority/inferiority of commodities. The larger the turnover factor, the quicker it enters and leaves stock. In other words, this is an indication that the commodity is selling well.
Stock turnover period	This is an inverse (stock sum divided by shipping sum) of stock turnover factor. The shipping sum is totalized in year, month, week, and day periods. Since the turnover period is expressed as the number of days still in stock when totalization is performed in day periods, it is intuitively easier to understand than stock turnover factor.
STOP SIGNAL	In positioning control, this is the input signal that directly stops the operation from an external source. The operation stops when the external stop signal (a-contact) turns ON (continuity).
Stopper stop	This is one of the methods of zero return in positioning. A stopper is provided at the origin and axis movement is stopped when the axis comes into contact with the stopper.

用語 （Term）	解説 （Description）
Strobe signal	A pulse signal emitted for synchronization and for removing the influence of noise before and after captured signals.
Stroke limit	Range in which positioning operation is possible or range in which axis movement beyond this range will result in machine damage.
Structured ladder/FBD:	The structured ladder/FBD language is a graphic language developed based on the relay ladder programming technique. Since it can be understood intuitively, it is commonly used for the sequence programming.
Subset Processing	Subset processing is used to place limits on bit devices used by basic instructions and application instructions in order to increase processing speed.
Summing box	An equipment required for the use of multiple load cells The outputs from multiple load cells are batch-output as one signal in parallel connection.
Supplier	The person or company who an order is placed with, the supplier of items (inventory) or resources (load).
Surge	●Abnormal voltage. ●Voltage that may occur the moment that the coil is turned OFF. ●Surge damages semiconductor elements and reduces their life. Surge also causes noise and so it is suppressed by a surge killer.
Surge killer	●An element used for the purpose of suppressing surge. ●A surge killer is connected when there is a coil or other inductive load on the output side of the programmable controller.
Surge ON	●An input signal on the servo amplifier. ●The servo amplifier energizes the servo motor to start control when the servo ON (SON) signal turns ON.
SV	Setting value
Switching regulator	●A stabilized power supply that turns AC into DC. ●50 Hz or 60 Hz AC is temporarily converted to high frequency, and after this it is rectified (switched) to become DC. ●Features of switching regulators include high efficiency, small size and resistance to voltage drops on the AC side, and they are often used as power supplies for electronic circuits. ●Rush current when the AC input side is turned ON is large.
Synchronization method	●Transmission of data after notifying the receiver of the timing that the data will be sent from the sender when sending data is referred to as "synchronizing." ●If the send/receive timing does not match, the receiver will start reading the data midway, making the data completely gibberish. ●There are two types of synchronization methods. 1. Bit synchronization method where timing is matched by individual bits 2. The frame synchronization method where timing is matched to a receptacle called a frame (block) which groups together a number of bits. The frame synchronization method is adopted on MELSEC data links.
System accuracy	●This indicates the range of variance of output with respect to input. ●This refers to the accuracy with respect to maximum values on both the A/D and D/A conversion modules. ●A condition of system accuracy is that ambient temperature, voltage fluctuation, etc. are within allowable ranges. ●On A/D conversion module A68AD, output 2000 must be within ±1% of input of 10V. ●On D/A conversion module A62DA, output 10V must be within ±1% of input of 2000.
T/D conversion	Conversion of temperature to digital values.
Table	Data management format managed with relational databases It is a two-dimensional table format composed of rows and columns.
Tact time	●The time from supply of materials to the production line up to completion of the product. ●This is also called "line tact." ●It sometimes simply refers to the time required for executing work predetermined in production processes. ●Tact time is the value obtained by multiplying operating time (working hours) by the number of production schedule units.

用語 (Term)	解説 (Description)
Tag	Tags for identification attached to process control equipment.
Tag	A format for writing commands and comments in an HTML document that expresses how a home page looks and behaves. Enclosing text in tags determines the design, etc. when a page is displayed in a web browser. With XML documents, text strings that are programmed to clearly indicate the position of elements and store attributes are called "tags." There are three types of tags: start tag, end tag and empty element tag.
Tag number	Tag numbers are unique management numbers used for identifying process control equipment. A tag number consists of the variable symbols, function symbols, and individual numbers. Prescribed by JIS Z8204.
Task	A task is an element that contains multiple POUs, and it is registered to a program file. One or more program blocks of POU need to be registered in a task. (Functions and function blocks cannot be registered in a task.)
TCO (Total Cost of Ownership)	The total sum of costs incurred to install, maintain/manage, etc. a computer system.
TCP/IP protocol	●A network protocol. ●TCP takes charge of layer 4 (transport layer) of the OSI reference model, while IP takes charge of layer 3 (network layer). ●Layer 1 (physical layer) and layer 2 (data link layer) are not specified, and different networks such as wired and wireless networks can be grouped together, for example, to form a single network. ●Since TCP/IP has been adopted in UNIX BSD4.3, it is essentially the standard protocol in networks that link workstations. ●It is the standard protocol used on the Internet and LANs.
Teaching	●The action of an operator memorizing information needed for the required work to machine memory. ●Teaching mainly teaches operating positions, while programming teaches operating sequences.
Temperature bias	Temperature/pressure correction operation uses absolute unit (absolute temperature, absolute pressure). Temperature bias is a corrected value to convert design temperature/measured temperature to absolute temperature.
Temperature sensor	A generic term for thermocouples and platinum resistance thermometers
Temperature/Pressure Correction	When the fluid conditions (temperature, pressure), of which the differential pressure measured by equipment which has diagram such as orifice, are not the same as the design conditions, it shall be corrected. Correction shall be performed by process variable to multiply the temperature/pressure correction coefficient. In addition, when equipment with diaphragm such as orifice is used, the obtained value is square of the flow rate. So that extraction of square root shall be applied.
TFT liquid crystal display	●Thin-Film transistor ●An active matrix type LCD where individual transistors are located at the intersections of numerous horizontally and vertically arranged transparent electrodes, and each pixel is driven and turned ON/OFF by these thin-film transistors (TFT). TFT has fast response. ●For color display, each single pixel has 3 TFTs. Color display is enabled by filtering through respective R, G and B color filters. ●Compared with simple matrix LCDs, TFT LCDs do not cause a drop in contrast, the number of scanlines can be increased, and mid-tones can be easily reproduced, thus enabling high-definition display.
Thermal sensor	A device for protecting a servo motor from burning caused by temperature rise.
Thermocouple	●Electrical temperature sensor. ●A voltage is generated when heat is applied to two different types of metal in contact with each, and that voltage is measured and converted to temperature.
Thermometer	A device which measures temperature. Representative types are described in the following table. Many thermometers are used in process control. Thermocouple (B, S, R, K, E, J) -180℃～1550℃ (Temperature range as reference) Resistance bulb (pt. 3-wire type, 4-wire type) -180℃～500℃ Contact type Thermistor -50℃～200℃ Optical pyrometer 700℃～3000℃ Radiation thermometer -50℃～4000℃

用語 (Term)	解説 (Description)
Throughput	This is a TOC term referring to the periodic income, which is calculated by subtracting direct costs (material expenses only) from selling price. It indicates how efficiently a plant is generating profit. A feature of this approach is that fixed costs such as facilities are not factored in.
Time Proportioning Control	Time proportioning control changes the ON/OFF ratio in proportion to the PID operation result, controls such as heater.
Time stump	This refers to the information (e.g. file creation date/time, file update date/time) that is saved to record the time that an object was operated. Normally, the date stamp often refers to the attributes of the file that is recorded on disk, however, it is used to refer to date and other information in cases other than this.
Time zone	Standard time zone for each region of the world Each nation uses the time difference (12 hours maximum) from the time at the Greenwich Observatory in the United Kingdom (GMT) as the standard time. The region using the same time difference is called a time zone. The standard time for Japan is 9 hours ahead of the GMT. In some nations, daylight time in which the clock is advanced for one hour is used in summer.
TOC (Theory Of Constraints)	A theory of constraints in production control conceived by the Israeli E. Goldratt that gives priority to bottleneck processes in scheduling.
Token-bus method	●Generally, the topology of the physical transmission path is a ring. With this method, however, a bus topology is applied. ●This is the same as the token-ring method in that tokens are used to acquire transmission rights. ●Note, however, that since terminals are connected to a bus topology line, the order in which tokens are made to go round the ring is not determined as it is. So, numbers indicating the order that token pass along the ring are assigned to terminals so that token pass along the ring in that number order.
Token-ring method	●A network access method developed by IBM Corporation. It is stipulated in IEEE802.5. ●By this method, the transmission path is connected in a ring topology, special data expressing transmission rights called "tokens" are passed along this transmission path in 1 direction to be sent to terminal devices, and only terminal devices that have transmission rights are allowed to send. ●When a token with a corresponding number arrives at a terminal, terminals with data to send obtain transmission rights to send that data. The sent data is received by the destination terminal and then returned again to the terminal that sent the data. ●The terminal that sent the data absorbs the returned data and at the same time sends the token onto the transmission path. ●Tokens are received and handed back in order and go around the terminal devices on the ring. ●Since only a single item of data is on the line, communications can be performed efficiently without any collisions.
Tolerance	A minute dimensional error allowed in specifications.
Torque ripple	The fluctuation margin of torque
Total length of loop extension	●The total length of the cable in a data link. ●Viewed from the master station, this is the distance from the transmission terminal to the reception terminal after making a complete round of the slave stations.
Traceability	This refers to the production information that is left behind so that causes can be looked into, for example, in the event of a product defect.
Tracking	Tracking is a function to follow-up a specific signal to accord with another signal.
Tracking function (servo)	A function for executing positioning at relative speed on a moving object by input travel amount from an external encoder and adding that travel amount to the servo command value.
Traffic	Digital data, such as audio, documents and images, moving on a network. It can also refer to the amount of information of these data that move on a network.
Transducer	●A device for converting analog amounts. ●A transducer can convert analog values to an easy-to-handle level (10V, 20mA, etc.) so that temperature, pressure, etc. is converted to DC0 to 10V and current 5A is converted to 10mA. ●Transducers are connected before the inputs of programmable controller A/D converters.
Transient transmission	A function of communication with another station, which is used when requested by dedicated instruction or engineering tool

用語 (Term)	解説 (Description)
Transistor output	Non-contact output exclusively for DC. Transistor output has a fast ON/OFF time.
Transmission band	Speed range in which transmission on optical fiber cables is possible.
Transmission delay	●Though this differs slightly on MELSECNET and in a multidrop configuration, this refers to the delay in information transactions between the master station and slave station. ●On MELSECNET, information is transmitted once to the slave station per 1 scan of the master station, and the slave station batch loads and outputs information. ●Actual delay differs considerably according to the scan times and link scan times of the master and slave stations, and the combination of link points. ●In a multidrop link, the master station transmits data in series in the setting order of the slave stations, and repeats this operation. In this case, the transmission delay time differs according to the number of links.
Transmission level	Value indicating the assurance level of optical power on the sending side of the data link.
Transmission line type	●The "duplex loop type" in MELSECNET refers to a method where cables are doubly routed in a circular shape. This enables a loopback. ●Otherwise, there is also a simplex bus type.
Transmission loss	Energy that is lost midway when signals are sent.
Transmission method	●In transmitting binary numbers 0 and 1 like data, key points are speed, accuracy and economy. Broadly speaking, there are 2 methods. 1. Serial transmission: A method used on programmable controller data links. It requires few cables and is economical. 2. Parallel transmission: A method used for transmitting data to printers and other output devices. It is expensive on long distances since it requires many cables.
Triac output	●Non-contact output exclusively for AC. ●This output method uses triacs instead of contacts as programmable controller outputs. ●It is long-life.
Trigger buffering	When trigger conditions (conditions for data transmission) of multiple jobs are met in a concentrated manner, their data and trigger times are buffered in the module's internal memory so that actions (data operation/transmission) can be executed later using the buffered data. Even if the frequency of data transmission triggers is high, jobs are executed without missing any trigger.
Tuning trend	A trend screen which displays a tuning status of loop in real time. It displays PV, SV, and MV.
Twisted cable	●This refers to two twisted unshielded insulated leads. These are thin, easy-to-bend and cheap. ●It is used for telephone lines.
Twisted pair lead	Electrical lead made by twisting two insulated leads. This lead is mainly used because it can prevent electromagnetic induced noise by the reciprocal motion of current along these two leads.
Twisted shielded cable	●Electrical lead comprising twisted pair lead with a shielded covering on the outside. The shield is grounded. ●The purpose of this cable is to prevent electromagnetic induced noise and electrostatic induced noise.
Undefined station	Station to which a station No. is to be set in the sequence program, however, that has presently no station No. because the UINI instruction has not been executed yet.
Upload	Generally, this refers to sending data to a server or other host computer. With programmable controllers, however, this means using a peripheral device or computer to read the program from the programmable controller. This means the opposite of download.
URL encode	Converts character strings into characters can be used in URLs. This designates percent encoding defined by RFC3986.
URL(Uniform Resource Locator)	Abbreviation for Uniform Resource Locator Notation method for indicating the locations of information resources on the Internet

用語 （Term）	解説 （Description）
Varistor	●A kind of electrical resistor. ●Varistors have the property where resistance value suddenly decreases when the voltage applied at both ends increases. ●This property is used to connect contacts and transistors in parallel for the purpose of absorbing high voltage surges. ●Compared with CR absorbers, varistors have slightly weaker effect against sudden (high frequency) surge, and so both CR absorbers and varistors are used for triacs and other components. ●Varistors are used also in parallel with inductive loads. ●They can be used one either AC or DC.
Vendor	A company that sells a product. It refers to a product manufacturer or sales agent. Building of a system using only the products made by a specific company is called a "single vendor," while building of a system using a combination of products made by two or more companies is called a "multi-vendor."
Voltage stabilizer	●A unit that makes the AC or DC voltage constant. ●An AC voltage for a programmable controller preferably should have a small constant voltage and waveform distortion. ●For DC, a stabilized power supply is used, and one with a small ripple factor is better.
VRAM	●Video RAM. ●A RAM exclusively for text, graphics and similar information that is displayed on CRTs, LCDs and other display devices.
Watchdog timer	●A timer for detecting abnormalities in the programmable controller's computation time. ●This timer monitors the time of a single scan of the program and outputs an alarm when the scan does not complete within the scheduled time.
Watchdog timer error alarm	An alarm which occurs when a status answer back time takes longer than the specified time after the control command such as open/close is output. A disconnection of control line, control power OFF, and contactor failure are possible causes.
Web browser	Abbreviation for the software used to view web pages.
Wiring	Wiring to programmable controllers basically conforms to the following rules: 1. Wiring is isolated and not routed in parallel to the power line. If wiring must be in parallel, allow at least 100 mm between the wiring and the power line. 2. Programmable controller 100V, 200V and DC24V power supply leads must be shortest distances and twisted. Also, thick power leads with extra capacity must be used. 3. Input wiring must be isolated from output wiring. Wiring must be at least 100 mm. AC leads must be isolated from DC leads. 4. A surge killer must be attached to generation sources on I/O devices where surge occurs easily.
WITH MODE	This is the mode that outputs the M code before the start of the positioning. This mode turns ON at the positioning start, enabling voltage to be applied to the welding electrodes, display of positioning speeds, etc. Refer to the term "AFTER MODE".
Word	A unit of amount of information. Broadly speaking, there are three types of frequently used term usages, "2 bytes", "standard size determined by OS" and "data volume of 1 address." When it is used as a unit expressing 2 bytes, 4 bytes are also expressed as a "double word." The names of WORD and DWORD types defined in Windows and API derive from this meaning.
Word device	●One of the devices in a programmable controller that holds data. ●A device where 1 point is configured by 1 word.
Word device SET function	●A function of the graphic operation terminal. ●A function for writing preset fixed values or the current values of specified word devices to a specified device by numeric key input from a touch panel or similar input device.
Work	Goods in process or parts that are to be worked on. This term is used in machine plants.
Work in process	This refers to products that currently in the process of being manufactured in factory lines.
Work leveling	Movement of loading that is loaded in each production facility to periods that still have extra capacity. (The equalization of workload matched to the load capacity of each process.)
Workspace	A workspace manages multiple projects at once.

用語 （Term）	解説 （Description）
XML (eXtensible Markup Language)	A programming language that is used for exchange of data between different programs on the Internet. A feature of XML is that identification codes called "tags" are inserted at various locations in data so that the other party can understand the data content.
XML Document	Documents and data created using language programmed in XML are called XML documents. Even if the document is a mass of data that looks like numerical enumerations and not at all resembling a document, it is called an XML document.
XY TABLE	This is a device that moves a table in the X (latitudinal) and Y (longitudinal) directions so that positioning can be carried out easily. There are also commercially available products.
Z PHASE	Also called "PG zero". Refer to "ZERO SIGNAL".
Zero cross switching	●On a thyristor for AC switching, turning conductivity ON and OFF at the vicinity of the 0 point of a sine wave current. ●The purpose of this is to control rush current. ●Moreover, it is simpler to control conductivity of a triac at the current 0 point due to its properties.
Zero drift	Zero-point variation caused by temperature
Zero point signal	One pulse generated per one rotation of the encoder shaft.
Zero return data	●Data that is required for a programmable controller positioning module for return to origin. ●Since this data is determined in design of the machine, changing this data later on involves design changes on the machine. ●The origin forms the point of reference in positioning. Therefore, a zero return should be executed, for example, when there is a power interruption or the power is turned OFF to manually move the machine, because the current value of the positioning module will deviate. ●When a zero return is applied, the machine moves to find a proximity dog regardless of the current value, changes travel speed to creep speed and overwrites the origin address at the position where it comes to a stop. ●Even if axis coordinates are monitored during a zero return, the current value does not change, and the position where movement stops when zero return is completed becomes the origin address.
Zero return method	There are 3 zero return methods in positioning depending on the structure of the machine and stopping precision: 1. According to the zero point signal from the pulse generator 2. Axis stop by stopper and motor stop by dwell timer 3. Axis stop by stopper and motor stop by detection of motor torque
Zero return request	The signal that turns ON when an abnormal state has occurred on the programmable controller positioning module. It turns ON in the following instances: 1. When the power is turned ON 2. When the stop (READY signal OFF) is applied during positioning 3. When the programmable controller READY signal turns ON 4. When parameters and zero return data are written from a peripheral device 5. When "zero return", "positioning", "JOG operation" and "manual pulser" are selected in the peripheral device test mode 6. When zero return is started

FA用語解説集

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