

TECHNICAL BULLETIN

[Issue No.] T40-0009

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[Title] Device latch function of Universal model QCPUs

[Date of Issue] Aug., '07

[Relevant Models] Q02UCPU, Q03UDCPU, Q04UDHCPU,
Q06UDHCPU

Thank you for your continued support of Mitsubishi programmable controllers, MELSEC-Q series.

This bulletin provides information on how to use the latch function (*) of Universal model QCPUs, which has been enhanced compared with the former QCPUs.

*: The latch function is a function that allows device data retention even if power is turned off or the CPU module is reset.

1. Methods for the latch function

Device data of Universal model QCPUs can be latched by:

- Using large-capacity file registers (R, ZR)
- Writing/reading device data to the standard ROM (SP.DEVST/S(P).DEVLD instruction)
- Specifying internal user devices as latch ranges

2. Latch function details

(1) Large-capacity file registers (R, ZR)

File registers are the devices whose data can be latched by batteries.

Universal model QCPUs has file registers of larger capacities than the former QCPUs, offering a high-speed file register processing. If many device points are to be set for latching, it is advisable to use the file registers.

Table 1 shows capacities of file registers for each CPU module.

Table 1 Capacities of file registers (R, ZR) for each CPU module

Model	Q02UCPU	Q03UDCPU	Q04UDHCPU	Q06UDHCPU
Capacity of file register (R, ZR) in standard RAM *2	64k points	96k points	128k points	384k points

*2 : Use of a memory card can increase the number of points.

(2) Writing/reading device data to the standard ROM (SP.DEVST/S(P).DEVLD instruction)

Device data of Universal model QCPUs can be latched by writing or reading them to the standard ROM with the write/read instruction (SP.DEVST/S(P).DEVLD). Utilizing the standard ROM allows data backup without batteries. This method is effective for latching data that will be updated less frequently.

(3) Specifying internal user devices as latch ranges

In the same way as for the former QCPUs, latching is available for Universal model QCPUs by specifying internal user devices as latch ranges. To specify the ranges, select [PLC parameter] → [Device] in GX Developer. The following are internal user devices that can be latched.

- Latch relay (L)
- Link relay (B)
- Annunciator (F)
- Edge relay (V)
- Timer (T)
- Retentive timer (ST)
- Counter (C)
- Data register (D)
- Link register (W)

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POINT

- If latch ranges of internal user devices are specified in a Universal model QCPU, the scan time is increased in proportion to the device points set for latching.
If a shorter scan time is needed, remove unnecessary latch device points to minimize the latch range.
- Latch range specification of a file register (R, ZR) does not increase the scan time.

3. How to shorten the scan time

When data to be latched are stored in a file register (R or ZR), the scan time is shorter than that for latching internal user devices.

The following is an example where the scan time is shortened by reducing the internal user device points in the latch range and allocating some of them to a file register (R or ZR).

Example) Reducing the number of latch points for data register (D) from 8k points to 2k points, and using a file register (ZR) instead (When using the Q06UDHCPU)

Table 2 Differences between before and after moving latch points from data register (D) to file register (ZR)

Item		Before	After
Latch points for data register (D)		8192 (8k) points	2048 (2k) points (6k points are allocated to file register)
Number of device usages in the program	Data register (D) (Latch range)	400	100
	File register (ZR) (Standard RAM)	0	300
Additional scan time		0.41 ms	0.13 ms *
Number of steps increased		—	300 steps

*: Indicates the time added when file register data are stored in the standard RAM.

4. Reference manuals

(1) QCPU User's Manual (Function Explanation, Program Fundamentals): SH-080484ENG

- “6.3 Latch Function”
..... Describes the latch function details.
- “10.1.2 (11) Latch processing time of device data”
..... Provides formulas for calculating the latch processing time of internal user devices.
- “6.30 Write/Read Device Data to/from Standard ROM”
..... Describes device data writing/reading to the standard ROM by using the SP.DEVST and S(P).DEVLD instructions.

(2) QCPU (Q Mode)/QnACPU Programming Manual (Common Instructions): SH-080039

- “Appendix 1.4 Operation Processing Time of Universal Model QCPU”
..... Lists the operation processing times for respective instructions of Universal model QCPUs.