

A 3D rendering of a water wheel with water cascading over its spokes, positioned next to a 3D coordinate system with x, y, and z axes. A red banner is superimposed over the scene.

**This overview shows products from
former NEC Electronics only!**

MCU Scout Industrial

78K 8-/16-bit Microcontrollers

Issue April 2010

Device			Memory			Interfaces				Timers & Other Peripherals							Miscellaneous Information							
Core	Nickname	Part number	Size [KB]	Type	RAM [B]	I/O lines	CSH/UARTs (LIN)	CAN	I ² C	External bus	Timer channels [8-bit/16-bit]	Special timers	PWMs	Clock-speed [Hz]	Internal oscillator(s)	Subclock	LCD	A/D- / D/A-converter	Supply voltage [V]	Pins	Packages	Qualification	Other features	OCD
78K0 (8-bit)	HCD/LED MCU	μPD78F8024	8	Flash	512	23	1/1	–	1	–	5/1	WDT	4	20	240 KHz, 1 MHz, 8 MHz	–	–	4/–	1.8...5.5, 9...38	64	GK-GAJ-AX	STD	4 x HCD, POC, LVI, MUL, DIV, BCD, LIN	–
		μPD78F8025	32		1 K																			
	78K0/USB	μPD78F0730	16	Flash	3 K	19	1/1	–	–	–	4/1	WDT	4	16	15 MHz, 240 KHz	–	–	–/–	4.0...5.5	30	MC-CAB-AX	STD	USBF, MUL, DIV, POC, BCD, SVF	✓
	78K0/Motor Control	μPD78F0711	8	Flash	768	15	0/1	–	–	–	2/1	Inverter timer (10-bit) x 1	7	20	240 KHz, 8 MHz	✓	–	4 x 10-bit/–	4.0...5.5	30	MC-CAB-AX	STD	POC, LVI, MUL, DIV	✓
		μPD78F0712	16		1 K	54	1/1	–	–	–	3/2		4	–	–	8 x 10-bit/–	64	GK-9ET-A	–					
		μPD78F0714	32		1 K	54	1/1	–	–	–	3/2		4	–	–	8 x 10-bit/–	64	GK-9ET-A	–					
	78K0R/L33	μPD78F1201	16	Flash	1 K	23	1/2	–	1	–	–/12	1 x Inverter timer	12	20	30 KHz, 20 MHz, 40 MHz	✓	–	6 x 10-bit/–	2.7...5.5	30	MC-CAB-AX	STD	POC, LVI, MUL, DIV, DMA	✓
		μPD78F1203	32		1.5 K																			
		μPD78F1211	16	Flash	1 K	27, 33, 38	2/4	–	2	–	–/12	1 x Inverter timer	12	20	30 KHz, 20 MHz, 40MHz	✓	–	8 x 10-bit/–, 10 x 10-bit/–, 11 x 10-bit/–	2.7...5.5	38, 44, 48	MC-GAA-AX, GB-GAF-AX, GA-GAF-AX	STD	POC, LVI, MUL, DIV, DMA	✓
		μPD78F1213	32		1.5 K																			
		μPD78F1214	48		2 K																			
		μPD78F1215	64		3 K																			
		μPD78F1223	32	Flash	1.5 K	42	2/4	–	2	–	–/12	1 x Inverter timer	12	20	30 KHz, 20 MHz, 40MHz	✓	–	11 x 10-bit/–	2.7...5.5	52	GB-GAG-AX	STD	POC, LVI, MUL, DIV, DMA	✓
		μPD78F1224	48		2 K																			
		μPD78F1225	64		3 K																			
		μPD78F1233	32	Flash	1.5 K	52	2/4	–	2	–	–/12	1 x Inverter timer	12	20	30 KHz, 20 MHz, 40MHz	✓	–	12 x 10-bit/–	2.7...5.5	64	GB-GAH-AX, GK-GAJ-AX	STD	POC, LVI, MUL, DIV, DMA	✓
		μPD78F1234	48		2 K																			
		μPD78F1235	64		3 K																			
	78K0R/K33	μPD78F1142A	64	Flash	4 K	55	2/3 (1)	–	2	–	–/8	–	6	20	240 KHz, 8 MHz	✓	–	8 x 10-bit/–	1.8...5.5	64	GB-GAH-AX, GK-GAJ-AX	STD	POC, LVI, MUL	✓
		μPD78F1143A	96		6 K																			
		μPD78F1144A	128		8 K																			
		μPD78F1145A	192		10 K																			
		μPD78F1146A	256	Flash	12 K	70	4/4 (1)	–	3	–	–/8	–	7	20	240 KHz, 8 MHz	✓	–	8 x 10-bit, 2 x 8-bit/–	1.8...5.5	80	GC-GAD-AX, GK-GAK-AX	STD	POC, LVI, MUL	✓
		μPD78F1152A	64		4 K																			
		μPD78F1153A	96		6 K																			
		μPD78F1154A	128		8 K																			
		μPD78F1155A	192	10 K																				
		μPD78F1156A	256	12 K																				
		μPD78F1162A	64	Flash	4 K	88	4/4 (1)	–	3	✓	–/8	–	7	20	240 KHz, 8 MHz	✓	–	8 x 10-bit, 2 x 8-bit/–	1.8...5.5	100	GC-UEU-AX, GF-GAS-AX	STD	POC, LVI, MUL, DMA	✓
		μPD78F1163A	96		6 K																			
μPD78F1164A	128	8 K																						
μPD78F1165A	192	10 K																						
μPD78F1166A	256	12 K																						
μPD78F1167A	384	24 K																						
μPD78F1168A	512	30 K																						
μPD78F1174A	128	Flash	8 K	116	6/4 (1)	–	5	✓	–/12	–	10	20	240 KHz, 8 MHz	✓	–	16 x 10-bit, 2 x 8-bit/–	1.8...5.5	128	GF-GAT-AX	STD	POC, LVI, MUL, DMA	✓		
μPD78F1175A	192		10 K																					
μPD78F1176A	256		12 K																					
μPD78F1177A	384		24 K																					
μPD78F1178A	512	30 K																						
μPD78F1184A	128	Flash	8 K	132	6/4 (1)	–	5	✓	–/12	–	10	20	240 KHz, 8 MHz	✓	–	16 x 10-bit, 2 x 8-bit/–	1.8...5.5	144	GJ-GAE-AX	STD	POC, LVI, MUL, DMA	✓		
μPD78F1185A	192		10 K																					
μPD78F1186A	256		12 K																					
μPD78F1187A	384		24 K																					
μPD78F1188A	512	30 K																						
	78K0R/K33-L	μPD78F1000	16	Flash	1 K	37	3/2(1)	–	1	–	–/8	–	7	20	20 MHz, 8 MHz, 1 MHz	✓	–	10 x 10-bit/– or 11 x 10-bit/–	1.8...5.5	44, 48	GB-GAF-AX, GA-HAA-AX, K8-4B4-AX, F1-AN1-A, F1-AA2-A	STD	POC, LVI, MUL, DIV, DMA, BCD	✓
		μPD78F1001	32		1.5 K																			
		μPD78F1001	48		2 K																			
		μPD78F1002	64		3 K																			
		μPD78F1003	37		41																			
		μPD78F1003	41		37																			
		μPD78F1004	32	Flash	1.5 K	45	3/2(1)	–	1	–	–/8	–	7	20	20 MHz, 8 MHz, 1 MHz	✓	–	11 x 10-bit/–	1.8...5.5	52	GB-GAG-AX	STD	POC, LVI, MUL, DIV, DMA, BCD	✓
		μPD78F1005	48		2 K																			
		μPD78F1006	64		3 K																			
		μPD78F1007	32	Flash	1.5 K	55	3/2(1)	–	1	–	–/8	–	7	20	20 MHz, 8 MHz, 1 MHz	✓	–	12 x 10-bit/–	1.8...5.5	64	GK-GAJ-AX, GB-GAH-AX, GA-HAB-AX, F1-AN1-A, F1-AA2-A	STD	POC, LVI, MUL, DIV, DMA, BCD	✓
		μPD78F1008	48		2 K																			
		μPD78F1009	64		3 K																			
μPD78F1010	64	Flash	4 K	71	4/4(1)	–	1	–	–/12	–	10	20	20 MHz, 8 MHz, 1 MHz	✓	–	12 x 10-bit/–	1.8...5.5	80	GC-GAD-AX, GK-GAK-AX	STD	POC, LVI, MUL, DIV, DMA, BCD, RTC, Clock/ Buzzer output	✓		
μPD78F1011	96		6 K																					
μPD78F1012	128		8 K																					
μPD78F1027	192		10 K																					
μPD78F1028	256	12 K																						
μPD78F1013	96	Flash	6 K	89	4/4(1)	–	1	–	–/12	–	10	20	20 MHz, 8 MHz, 1 MHz	✓	–	16 x 10-bit/–	1.8...5.5	100	GF-GAS-AX, GC-UEU-AX, F1-BAK-A	STD	POC, LVI, MUL, DIV, DMA, BCD, RTC, Clock/ Buzzer output	✓		
μPD78F1014	128		8 K																					
μPD78F1029	192		10 K																					
μPD78F1030	256		12 K																					
μPD78F1022	64	Flash	6 K	30	2/2	–	2	–	–/8	–	2	20	20 MHz, 8 MHz, 1 MHz	✓	–	8 x 10-bit/–	1.8...3.6	48	GA-HAA-AX	STD	USBF, POC, LVI, MUL, DIV, DMA, BCD	✓		
μPD78F1023	96		8 K																					
μPD78F1024	128		8 K																					
μPD78F1025	96	Flash	8 K	43	3/3	–	3	–	–/8	–	2	20	20 MHz, 8 MHz, 1 MHz	✓	–	8 x 10-bit/–	1.8...3.6	64	GA-HAB-AX, GB-GAH-AX, F1-AN9-AX	STD	USBF, POC, LVI, MUL, DIV, DMA, BCD	✓		
μPD78F1026	128		8 K																					
μPD78F1016	64	Flash	4 K	53	3/4(2)	–	1	–	–/8	–	5	20	20MHz, 8MHz, 1MHz	✓	–	12 x 12-bit/ 2 x 12-bit	1.8...5.5	64	F1-BA4-A	STD	POC, LVI, MUL, DIV, DMA, BCD, 3ch x OpAmp, voltage reference	✓		
μPD78F1017	96		6 K																					
μPD78F1018	128		7 K																					
μPD78F8040	32	Flash	4 K	26	1/2(1)	–	1	–	–/12	–	6	20	20MHz, 8MHz, 1MHz, 30kHz	–	–	6 x 10-bit/	3.0...5.5	56	K8-9B4-AX	STD	IO Link interface, POC, LVI, MUL, DIV, DMA, BCD, integrated 5V regulator	✓		
μPD78F8041	64		4 K																					
μPD78F8042	96		6 K																					
μPD78F8043	128		7 K																					
	78K0R/L33	μPD78F1500A	64	Flash	4 K	51	2/3(1)	–	0	–	–/8	–	5	20	20MHz, 8MHz, 1MHz	✓	31 x 4, 27 x 8	8 x 12-bit/ 2 x 12-bit	1.8...5.5	80	GC-GAD-AX, GK-GAK-AX	STD	POC, LVI, MUL, DIV, DMA, BCD, 3ch x OpAmp, voltage reference, LCD voltage booster	✓
		μPD78F1501A	96		6 K																			
		μPD78F1502A	128		7 K																			
		μPD78F1503A	64	Flash	4 K	67	3/4(2)	–	1	–	–/10	–	7	20	20MHz, 8MHz, 1MHz	✓	40 x 4, 36 x 8	12 x 12-bit/ 2 x 12-bit	1.8...5.5	100	GC-UEU-AX	STD	POC, LVI, MUL, DIV, DMA, BCD, 3ch x OpAmp, voltage reference, LCD voltage booster	✓
		μPD78F1504A	96		6 K																			
		μPD78F1505A	128		7 K																			
		μPD78F1506A	64	Flash	4 K	83	5/4(2)	–	1	–	–/10	–	7	20	20MHz, 8MHz, 1MHz	✓	54 x 4, 50 x 8	12 x 12-bit/ 2 x 12-bit	1.8...5.5	128	GF-GAT-AX	STD	POC, LVI, MUL, DIV, DMA, BCD, 3ch x OpAmp, voltage reference, LCD voltage booster	✓
		μPD78F1507A	96		6 K																			

78K 8-/16-bit Microcontrollers

Issue April 2010

Software & Dongles

IAR Workbench (8-bit)

- Integrated development environment for 78K0S, 78K0 and 78K0R
- C/EC++ support
- Compiler, assembler, linker, debugger, simulator, project manager, editor
- Order code: EW78K-FULL-EE



IAR Dongles

- Optional, not mandatory
- Supports several installations for a single user
- Easy re-installation after a memory accident on the PC
- Order code:
 - IAR-DONGLE (Parallel port interface)
 - IAR-DONGLE-USB (USB interface)



NEC Debugger

- Free of charge download from our website

Demo / Starter

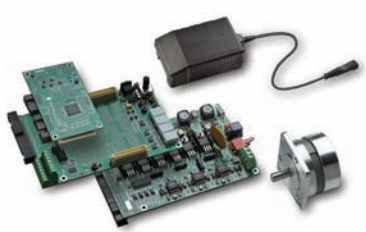
Low Pin Count – Do it!

- Main board
- PC connection via USB
- Prototyping space
- USB cable
- IAR Embedded Workbench (size limited)
- Order code: LPC-DOIT



Low Voltage Motor Control

- CPU board: μ PD78F0714
- Inverter board
- I/O board
- 12 V BLDC motor
- Dedicated GUI and sample programs
- Order code: MC-LVKIT-714 (Components also available separately)



78K0/Lx3 – See it!

- Main board
- 78K0/LF3 LCD MCU
- PC connection via USB
- Large segment display
- Prototyping space
- Application functions
- USB cable
- IAR Embedded Workbench (size limited)
- Order code: 78K0LX3-SEET



78K0R/Lx3 Motor Control Demonstration Kit

- Main board
- Complete and easy-to-use BLDC motor control tool
- 78K0R/Lx3 3-phase motor ASSP
- 12-18V BLDC motor drive
- Start / stop, direction and speed (RPM) control
- Fault detection
- USB and ZigBee™ interfaces
- IAR Embedded Workbench (size limited)
- Order code: 78K0RIX3-SPINIT



78K0/Kx2-L – Save it!

- Main board
- 78K0/KC2-L low power MCU
- PC connection and debug via USB
- USB cable
- Low power demo GUI and sample code
- IAR Embedded Workbench (size limited)
- Order code: 78K0-SAVEIT



HCD/LED MCU Demonstration Kit

- Main board
- Complete evaluation and development platform for LED lighting
- Dedicated 8-bit MCU with integrated current drive function
- Easy-to-use dedicated Appllet software generation tool
- IAR Embedded Workbench (size limited)
- Order code: 78K0-SHINEIT



78K0R – Cool it!

- Main board
- 78K0R/KG3 (μ PD78F1166GF)
- PC connection via USB
- LCD display
- USB cable
- IAR Embedded Workbench (size limited)
- Order code: 78K0R-COOLIT



78K0/USB Demonstration Kit

- Main board
- 78K0/USB (μ PD78F0730)
- PC connection and debug via USB
- Supports Full-Speed USB 2.2
- USB device full protocol stack
- HID and CCD class drivers
- USB device application examples
- IAR Embedded Workbench (size limited)
- Order code: 78K0USB



78K0R/Kx3-L – Save it!

- 78K0R/KE3-L low power MCU
- PC connection and debug via USB
- USB cable
- Low power demo GUI and sample code
- IAR Embedded Workbench (size limited)
- Order code: 78K0R-SAVEIT



ZigBee Starter Kit for 78K0

- 2 x 8-Bit ZigBee™ node boards
- MAC Software (object)
- Sample programs
- IAR Compiler Kickstart Version
- Flash programmer
- Order code: 78K0-ZIGBEE-SK



78K0R/Lx3 – Sense it!

- 78K0R/LH3 LCD MCU
- PC connection and debug via USB
- 400 segment LCD
- Temperature sensor and current consumption monitor
- ADPCM middleware & tools
- IAR Embedded Workbench (size limited)
- Order code: 78K0RLX3-SENSEIT



ZigBee Premium Development Kit for 78K0

- 4 x 8-Bit ZigBee™ node boards
- 8-Bit USB ZigBee™ node
- Air sniffer
- MAC Software (object)
- ZigBee™ Stack (object)
- Unlimited ZigBee™ license for the 78K0 family
- GUI Tools (SDK)
- Sample programs
- IAR Compiler Kickstart Version
- Flash programmer
- Order code: 78K0-ZIGBEE-PREM



78K0R – Say it!

- Main board
- 78K0R/KG3 (μ PD78F1166GC)
- PC connection and debug via USB
- Illuminance sensor
- On-board speaker
- Connector to external speakers
- Audio conversion and download tool
- Voice compression/decompression library
- USB cable
- IAR Embedded Workbench (size limited)
- Order code: 78K0R-SAYIT



ZigBee™ / ZigBee™ PRO Premium Development Kits for 78K0R

- 4 x 16-Bit ZigBee™ node boards
- 16-Bit USB ZigBee™ node
- Air sniffer
- MAC Software (object)
- ZigBee™ Stack (object)
- Unlimited ZigBee™ / ZigBee™ PRO license for the 78K0R family
- GUI Tools (SDK)
- Sample programs
- IAR Compiler Kickstart Version
- Flash programmer
- Order code ZigBee™ PRO: 78K0R-ZIGBEEPRO-PREM



78K0R IO-Link Demonstration Kit

- Main board
- For use with IO-Link industrial sensor and actuator applications
- 78K0R 16-bit MCU with 64 Kbytes Flash
- ELMOS 24 V IO-Link transceiver
- TMG Karlsruhe IO-Link device protocol stack (V1.0)
- M12 connector
- USB port
- IAR Embedded Workbench (size limited)
- Order code: 78K0R-LINKIT



78K Primer kit

- 78K0/KF2 and 78K0R/KG3 target boards
- Minicube2
- Components: temperature sensor, light sensor, buzzer
- Appllet 2 code generator
- IAR Embedded Workbench (size limited)
- Order code: 78K0IX2-LED



78K0/Lx2 LED Control

- 78K0/IB2 LED MCU
- Analog Dimming
- DALI & MMX512 communication
- Connects to Lighting Communications kit
- IAR Embedded Workbench (size limited)
- Order code: 78K0IX2-LED



Lighting Communications

- 78K0/KB2
- DALI & MMX512 communication
- DALI & DMX512 GUI controller tool
- IR control interface
- Order code: 78K0-LIGHTCOMMS



Programming

Flash programmer

- Supports all single voltage Flash devices
- Security flag supports
- 16 Mbytes internal memory for multiple codes
- PC connections via USB and RS-232
- Order code: PG-FP5-EE



MINICUBE 2

- Low price programmer
- Suitable for all single voltage flash devices
- Order code: QB-MINI2-EE



On-chip Debugging

QB-MINI2-EE On-chip debug



Size limited IAR workbench



USB cable ICE <-> PC (also for power supply)



78K0 conversion board



Target cables

Target system

Target boards

Simple boards that make the device's I/O available for quick evaluations. All target boards are supported by MINICUBE2. New target boards are being added on regular basis. Please contact your sales representative or visit our micro-controller web site for the latest details.

Common features

- Flash programming interface
- On-chip debugging supported
- Main and sub crystals mounted
- One switch, two LEDs
- User breadboard area

Core	Board	Devices	Flash	RAM	Order code
78K0S	UPD78F9234MC	78K0S/KB1+	8KB	256B	QB-78K0SKB1-TB
	UPD78F0547DGC	78K0/KF2	128KB	1KB	QB-78K0KF2-TB
	UPD78F0397DGC	78K0/LG2	128KB	1KB	QB-78K0LG2-TB
	UPD78F0730MC	78K0/USB	16KB	1KB	QB-78F0730-TB
	UPD78F0756MC	78K0/IB2	16KB	768B	QB-78K0IB2-TB
	UPD78F0588GA	78K0/KC2-L	32KB	1KB	QB-78K0KC2L-TB
78K0R	UPD78F0485GK	78K0/LF3	60KB	1KB	QB-78K0LF3-TB
	UPD78F1166GF	78K0R/KG3	256KB	12KB	QB-78K0RKG3-TB
	UPD78F1014GC	78K0R/KG3-L	128KB	8KB	QB-78K0RKG3L-TB
	UPD78F1009GC	78K0R/KE3-L	64KB	3KB	QB-78K0RKE3L-TB
	UPD78F1026GA	78K0R/KE3-L USB	128KB	8KB	QB-78F1026-TB
	UPD78F1508GF	78K0R/LH3	128KB	7KB	QB-78K0RLH3-TB
	UPD78F1235GK	78K0R/IE3	64KB	3KB	QB-78K0RIE3-TB

In-circuit Emulation

IECUBE In-circuit emulator



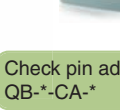
Size limited IAR workbench



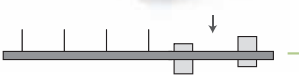
USB cable ICE <-> PC



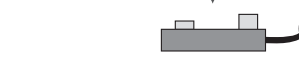
AC adapter cable



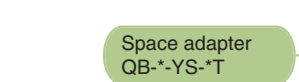
Flash programmer



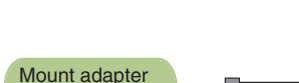
Check pin adapter QB-⁺CA-⁺



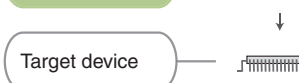
Extension probe QB-⁺EP-⁺



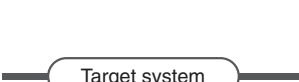
Exchange adapter QB-⁺EA-⁺T



Space adapter QB-⁺YS-⁺T



ICE Connector QB-⁺YQ-⁺T



Mount adapter QB-⁺HQ-⁺T



Target connector QB-⁺NQ-⁺T

Target system

See reverse for information on IECube adapters

- Mandatory
- Optional
- Included in delivery

78K 8-/16-bit Microcontrollers

Adapters, Sockets etc.

78K0 (8-bit)										
	Package	Device Series	78K0S/Kx1+	78K0/Lx3-M	78K0/Lx3	78K0/Kx2	Motor Control	78K0/Lx2	78K0/Kx2-L	78K0/USB
	10-pin MA	IECUBE	QB-78K0SK1-ZZZ-EE	QB-78K0LX3M-ZZZ-EE	QB-78K0LX3-ZZZ-EE	QB-78K0KX2-ZZZ-EE	QB-780714-ZZZ-EE	QB-78K0IX2-ZZZ-EE	QB-78K0KX2L-ZZZ-EE	QB-780731-ZZZ-EE
		Exchange adapter	QB-10MA-EA-01T							
		ICE connector	-							
		Target Connector	QB-10MA-NQ-01T							
		Mount adapter	-							
		Space adapter	-							
		Check pin adapter	-							
	16-pin GR	Extension probe	QB-50-EP-01T							
		Flash adapter	FA-78F9202MA-CACMX							
		Exchange adapter	QB-16GR-EA-01T							
		ICE connector	-							
		Target Connector	QB-16GR-NQ-01T							
		Mount adapter	-							
		Space adapter	-							
	16-pin MA	Check pin adapter	-							
		Extension probe	QB-50-EP-01T							
		Flash adapter	FA-78F9212GR-JIG-MX							
		Exchange adapter	QB-20MC-EA-01T					QB-78K0IY2-EA-01T	QB-78K0KY2L-EA-01T	
		ICE connector	-							
		Target Connector	QB-20MC-NQ-01T					QB-16GR-NQ-01T	QB-16GR-NQ-01T	
		Mount adapter	-							
20-pin MC	Space adapter	-								
	Check pin adapter	-								
	Extension probe	QB-50-EP-01T								
	Flash adapter	FA-78F9222MC-5A4-MX								
	Exchange adapter	QB-30MC-EA-04T								
	ICE connector	-								
	Target Connector	QB-30MC-NQ-02T								
30-pin MC	Mount adapter	-								
	Space adapter	-								
	Check pin adapter	-								
	Extension probe	QB-50-EP-01T								
	Flash adapter	FA-78F9234MC-5A4-MX								
	Exchange adapter	QB-30MC-EA-02T				QB-30MC-EA-03T	QB-78K0IB2-EA-01T	QB-78K0KB2L-EA-01T	QB-30MC-EA-01T	
	ICE connector	-				QB-30MC-YQ-01T	QB-30MC-YQ-01T	QB-30MC-YQ-01T	QB-30MC-YQ-01T	
36-pin FC	Target Connector	QB-30MC-NQ-02T				QB-30MC-NQ-01T	QB-30MC-NQ-01T	QB-30MC-NQ-01T	QB-30MC-NQ-01T	
	Mount adapter	-				QB-30MC-HQ-01T	QB-30MC-HQ-01T	QB-30MC-HQ-01T	QB-30MC-HQ-01T	
	Space adapter	-				QB-30MC-YQ-01T	QB-30MC-YQ-01T	QB-30MC-YQ-01T	QB-30MC-YQ-01T	
	Check pin adapter	-				QB-144-CA-01	QB-144-CA-01	QB-144-CA-01	QB-144-CA-01	
	Extension probe	QB-50-EP-01T				QB-80-EP-01T	QB-80-EP-01T	QB-80-EP-01T	QB-80-EP-01T	
	Flash adapter	FA-78F9234MC-5A4-MX				-	FA-78F0756MC-CAB-RX	FA-78F0578MC-CAB-RX	FA-30MC-CAB-B	
	Exchange adapter					QB-36FC-EA-01T				
38-pin MC	ICE connector					QB-36FC-NQ-01T				
	Target Connector									
	Mount adapter	-				-				
	Space adapter	-				-				
	Check pin adapter	-				QB-144-CA-01	QB-144-CA-01			
	Extension probe					QB-80-EP-01T	QB-80-EP-01T			
	Flash adapter					FA-78F0503FCAA3-MX				
44-pin GB	Exchange adapter					QB-38MC-EA-01T				
	ICE connector					QB-38MC-YQ-01T				
	Target Connector					QB-38MC-NQ-01T				
	Mount adapter	-				QB-38MC-HQ-01T				
	Space adapter	-				QB-38MC-YQ-01T				
	Check pin adapter	-				QB-144-CA-01				
	Extension probe					QB-80-EP-01T				
48-pin GA	Flash adapter					-				
	Exchange adapter					QB-44GB-EA-03T			QB-78K0KC2L-EA-02T	
	ICE connector					QB-44GB-YQ-01T			QB-44GB-YQ-01T	
	Target Connector					QB-44GB-NQ-01T			QB-44GB-NQ-01T	
	Mount adapter	-				QB-44GB-HQ-01T			QB-44GB-HQ-01T	
	Space adapter	-				QB-44GB-YQ-01T			QB-44GB-YQ-01T	
	Check pin adapter	-				QB-144-CA-01			QB-144-CA-01	
52-pin GB	Extension probe					QB-80-EP-01T			QB-80-EP-01T	
	Flash adapter					FA-78F0513GB-UES-MX			FA-78F0588GB-GAF-RX	
	Exchange adapter					QB-48GA-EA-03T			QB-78K0KC2L-EA-01T	
	ICE connector					QB-48GA-YQ-01T			QB-48GA-YQ-01T	
	Target Connector					QB-48GA-NQ-01T			QB-48GA-NQ-01T	
	Mount adapter	-				QB-48GA-HQ-01T			QB-48GA-HQ-01T	
	Space adapter	-				QB-48GA-YQ-01T			QB-48GA-YQ-01T	
64-pin GB	Check pin adapter	-				QB-144-CA-01			QB-144-CA-01	
	Extension probe					QB-80-EP-01T			QB-80-EP-01T	
	Flash adapter					FA-78F0413GAM-MX	FA-78F0515GA-8EU-MX		FA-78F0588GA-GAM-RX	
	Exchange adapter					QB-52GB-EA-03T	QB-52GB-EA-02T			
	ICE connector					QB-52GB-YQ-01T	QB-52GB-YQ-01T			
	Target Connector					QB-52GB-NQ-01T	QB-52GB-NQ-01T			
	Mount adapter	-				QB-52GB-HQ-01T	QB-52GB-HQ-01T			
64-pin GA	Space adapter	-				QB-52GB-YQ-01T	QB-52GB-YQ-01T			
	Check pin adapter	-				QB-144-CA-01	QB-144-CA-01			
	Extension probe					QB-80-EP-01T	QB-80-EP-01T			
	Flash adapter					FA-78F0433GB-GAG-MX	FA-78F0527GB-UET-MX			
	Exchange adapter					QB-64GA-EA-04T				
	ICE connector					QB-64GA-NQ-01T				
	Target Connector					-				
64-pin GK	Mount adapter	-				QB-144-CA-01	QB-144-CA-01			
	Space adapter	-				QB-80-EP-01T	QB-80-EP-01T			
	Check pin adapter	-				FA-78F0537GK-UET-MX				
	Extension probe					QB-64GB-EA-04T				
	Flash adapter					QB-64GB-YQ-01T				
	Exchange adapter					QB-64GB-NQ-01T				
	ICE connector					QB-64GB-HQ-01T				
80-pin GC	Target Connector					QB-64GB-YQ-01T				
	Mount adapter					QB-64GB-NQ-01T				
	Space adapter					QB-64GB-HQ-01T				
	Check pin adapter					QB-64GB-YQ-01T				
	Extension probe					QB-144-CA-01	QB-144-CA-01			
	Flash adapter					QB-80-EP-01T	QB-80-EP-01T			
	Exchange adapter					FA-78F0465GK-GAJ-MX	FA-78F0537GK-UET-MX		FA-64GK-9ET-A	
80-pin GK	ICE connector					QB-80GC-EA-01T	QB-80GC-EA-01T			
	Target Connector					QB-80GC-YQ-01T	QB-80GC-YQ-01T			
	Mount adapter					QB-80GC-NQ-01T	QB-80GC-NQ-01T			
	Space adapter					QB-80GC-HQ-01T	QB-80GC-HQ-01T			
	Check pin adapter					QB-80GC-YQ-01T	QB-80GC-YQ-01T			
	Extension probe					QB-144-CA-01	QB-144-CA-01			
	Flash adapter					QB-80-EP-01T	QB-80-EP-01T			
100-pin GC	Flash adapter					FA-78F0495GK-GAD-MX	FA-78F0547GK-UBT-MX			
	Exchange adapter					QB-80GK-EA-01T	QB-80GK-EA-01T			
	ICE connector					QB-80GK-YQ-01T	QB-80GK-YQ-01T			
	Target Connector					QB-80GK-NQ-01T	QB-80GK-NQ-01T			
	Mount adapter					QB-80GK-HQ-01T	QB-80GK-HQ-01T			
	Space adapter					QB-80GK-YQ-01T	QB-80GK-YQ-01T			
	Check pin adapter					QB-144-CA-01	QB-144-CA-01			
100-pin GF	Extension probe					QB-80-EP-01T	QB-80-EP-01T			
	Flash adapter					FA-78F0495GK-GAK-MX	FA-78F0547GK-8EU-MX			
	Exchange adapter					QB-100GC-EA-08T				
	ICE connector					QB-100GC-YQ-01T				
	Target Connector					QB-100GC-NQ-01T				
	Mount adapter					QB-100GC-HQ-01T				
	Space adapter					QB-144-CA-01				
128-pin GF	Check pin adapter					QB-144-EP-02S				
	Extension probe					Under development				
	Flash adapter									
	Exchange adapter									
	ICE connector									
	Target Connector									
	Mount adapter									
144-pin GJ	Space adapter									
	Check pin adapter									
	Extension probe									
	Flash adapter									
	Exchange adapter									
	ICE connector									
	Target Connector									

78K0R (16-bit)								
		78K0R/Lx3	78K0R/Kx3	78K0R/Lx3	78K0R/Kx3-L USB	78K0R/Kx3-L	78K0R/IO Link	
		QB-78K0R/KX3L-EE	QB-78K0RKX3-ZZZ-EE	QB-78K0RLX3-ZZZ-EE	QB-78F1026-ZZZ-EE	QB-78K0RKX3C-ZZZ-EE	QB-78K0RKX3C-ZZZ-EE	
	30-pin MC	Exchange adapter	QB-30MC-EA-05T					
		ICE connector	QB-30MC-YQ-01T					
		Target Connector	QB-30MC-NQ-01T					
		Mount adapter	QB-30MC-HQ-01T					

V850 32-bit Microcontrollers

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Device			Memory			Interfaces			Timers & other peripherals										Miscellaneous information																						
Core	Nickname	Part number	Size [Kb]	Type	RAM [B]	I/O lines	CSIs/UARtIs (LIN)	CAN	I ² C	External bus	Timer channels [8-bit/16-bit]	Special timers	PWMs	Clock speed [Hz]	Internal oscillator(s)	Subclock	LCD	A/D- / D/A-converter	Supply voltage [V]	Pins	Packages	Qualification	Other features	OC ^D																	
V850ES (32-bit) H Series	V850ES/HE2	μPD70F3700	64	Flash	6 K	51	2/2 (2)	–	–	–	–/6	–	5	20	200 kHz	✓	–	10 x 10-bit/–	3.5...5.5	64	GB-8EU-A	STD	POC, LVI, MUL	✓																	
		μPD70F3701	128																																						
		μPD70F3702	64																																						
	V850ES/HF2	μPD70F3703	128	Flash	12 K	67	2/2 (2)	–	–	–	–/6	–	5	20	200 kHz	✓	–	12 x 10-bit/–	3.5...5.5	80	GK-9EU-A	STD	POC, LVI, MUL	✓																	
		μPD70F3704	256																																						
		μPD70F3706	128																																						
	V850ES/HG2	μPD70F3707	256	Flash	12 K	84	3/2 (3)	–	–	–	–/7	–	6	20	200 kHz	✓	–	16 x 10-bit/–	3.5...5.5	100	GC-8EA-A	STD	POC, LVI, DMA, MUL	✓																	
		μPD70F3709	128																																						
		μPD70F3710	256																																						
	V850ES/HJ2	μPD70F3711	376	Flash	20 K	128	3/3 (3)	–	–	✓	–/8	–	7	20	200 kHz	✓	–	24 x 10-bit/–	3.5...5.5	144	GJ-UEN-A	STD	POC, LVI, DMA, MUL	✓																	
		μPD70F3712	512				3/4 (4)																																		
		μPD70F3712	512																																						
	V850ES/HK3	μPD70F3747	128	Flash	8 K	51	2/2 (2)	–	1	–	–/7	–	6	32	240 KHz, 8 MHz	✓	–	10 x 10-bit/–	3.5...5.5	64	GB-GAH-AX	STD	POC, LVI, DMA, MUL, DIV	✓																	
		μPD70F3750	256																																						
		μPD70F3752	256																																						
		μPD70F3755	256																																						
V850ES (32-bit) I Series	V850ES/IK1	μPD703327	64	Mask	4 K	39	1/2	–	–	–	–/7	Inverter timer (16-bit) x 1	12	32	–	–	–	8 x 10-bit/–	3.5...5.5	64	GC-8BS-A, K8-9BS-AX	STD	POC, MUL	✓																	
		μPD703329	128																																						
		μPD70F3713	64																																						
	V850ES/IE2	μPD70F3714	128	Flash	7 K	39	1/2	–	–	–	–/7	Inverter timer (16-bit) x 1	16	20	–	–	–	4 x 10-bit/–	3.5...5.5	64	GC-8BS-A	STD	POC, MUL	✓																	
		μPD70F3714	128																																						
	V850ES/IA3	μPD703183	128	Mask	6 K	50	2/2	–	–	–	–/8	Inverter timer (16-bit) x 1	8	64	–	–	–	12 x 10-bit/–	3.5...5.5	80	GC-8BT-A	STD	DMA, MUL	✓																	
		μPD703184	256																																						
	V850ES/IA4	μPD703185	128	Mask	6 K	64	2/2	–	–	–	–/9	Inverter timer (16-bit) x 2	18	64	–	–	–	16 x 10-bit/–	3.5...5.5	100	GC-8EU-A, GF-3BA-A	STD	DMA, MUL	✓																	
		μPD703186	256																																						
		μPD70F3186	256																																						
	V850ES/IF3	μPD70F3451	128	Flash	8 K	48	3/4	–	–	–	–/13	Inverter timer (TMQOP) x 2	64	64	–	–	–	4 x 10-bit, 10 x 12-bit/–	3.5...5.5	80	GC-UBT-A	STD	POV, LVI, DMA, MUL	✓																	
		μPD70F3452	256																																						
	V850ES/IG3	μPD70F3453	128	Flash	8 K	64	3/4	–	–	–	–/13	Inverter timer (TMQOP) x 3	64	64	–	–	–	8 x 10-bit, 10 x 12-bit/–	3.5...5.5	100	GC-8EA-A, GF-GAS-A	STD	POV, LVI, DMA, MUL	✓																	
		μPD70F3454	256																																						
V850E (32-bit) I Series	V850E/JG4	μPD70F3913	256	Flash	24 K	67	3/4(0)	–	1	–	–/13	2 x Motor control PWM	22	100	–	–	–	1 x 10-bit, 2 x 12-bit/–	1.35...1.65 4.0...5.5	100	GC-UEU-AX GF-GAS-AX	STD	POC, LVI, MUL, DMA (7ch), 6 x Opamp, 12 x Comparator	✓																	
		μPD70F3913	256																																						
		μPD70F3914	384																																						
		μPD70F3914	384																																						
		μPD70F3915	480																																						
		μPD70F3915	480																																						
	V850E/IH4	μPD70F3916	256	Flash	24 K	80	3/4(0)	–	1	–	–/13	2 x Motor control PWM	22	100	–	–	–	1 x 10-bit, 2 x 12-bit/–	1.35...1.65 4.0...5.5	128	GF-GAT-AX	STD	POC, LVI, MUL, DMA (7ch), 6 x Opamp, 12 x comparator	✓+trace																	
		μPD70F3917	384																																						
		μPD70F3918	480																																						
	V850E/JG4-H	μPD70F3919	256	Flash	24 K	63	3/4(0)	–	1	Y	–/13	2 x Motor control PWM	22	100	–	–	–	1 x 10-bit, 2 x 12-bit/–	1.35...1.65 4.0...5.5	100	GC-UEU-AX	STD	POC, LVI, MUL, DMA (7ch), 6 x Opamp, 12 x comparator USB Function	✓																	

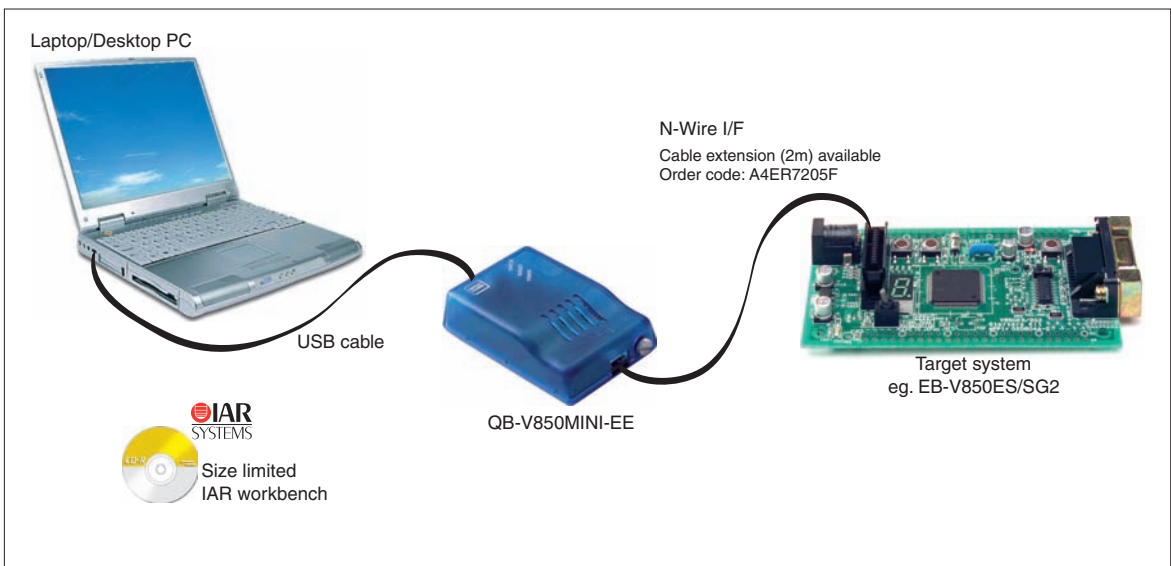
V850 32-bit Microcontrollers

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On-chip Debugging

N-Wire

Purpose	N-Wire based debugging system
Supported devices	ALL V850 devices with N-Wire interface
External power supply	Not required
Device interface	N-Wire
PC interface	USB
Order code	QB-V850MINI-EE



Target boards

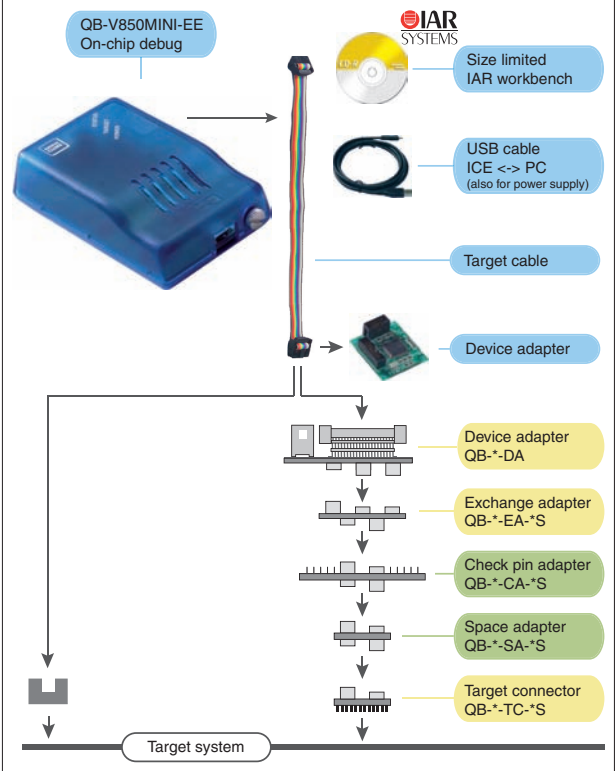
Simple boards that make the device's I/O available for quick evaluations. All target boards are supported by MINICUBE2. New target boards are being added on regular basis. Please contact your sales representative or visit our microcontroller web site for the latest details.

Common features:

- Flash programming interface
- On-chip debugging supported
- Main and sub crystals mounted
- One switch, two LEDs
- User breadboard area

Core	Board	Devices	Flash	RAM	Order code
V850	UPD70F3714GC	V850ES/IE2	128KB	6KB	QB-V850ESIE2-TB
	UPD70F3707GC	V850ES/HG2	256KB	12KB	QB-V850ESHG2-TB
	UPD70F3717GC	V850ES/JG2	384KB	32KB	QB-V850ESJG2-TB
	UPD70F3732GK	V850ES/KG2	256KB	16KB	QB-V850ESKG2-TB
	UPD70F3738GC	V850ES/JG3-L	256KB	16KB	QB-V850ESJG3L-TB
	UPD78F3764GF	V850ES/JG3-U	512KB	56KB	QB-V850ESJG3U-TB
	UPD70F3746GJ	V850ES/JJ3	1024KB	60KB	QB-V850ESJJ3-TB
	UPD70F3752GC	V850ES/HG3	256KB	16KB	QB-V850ESHG3-TB
	UPD70F3454GC	V850E/IG3	256KB	12KB	QB-V850EIG3-TB

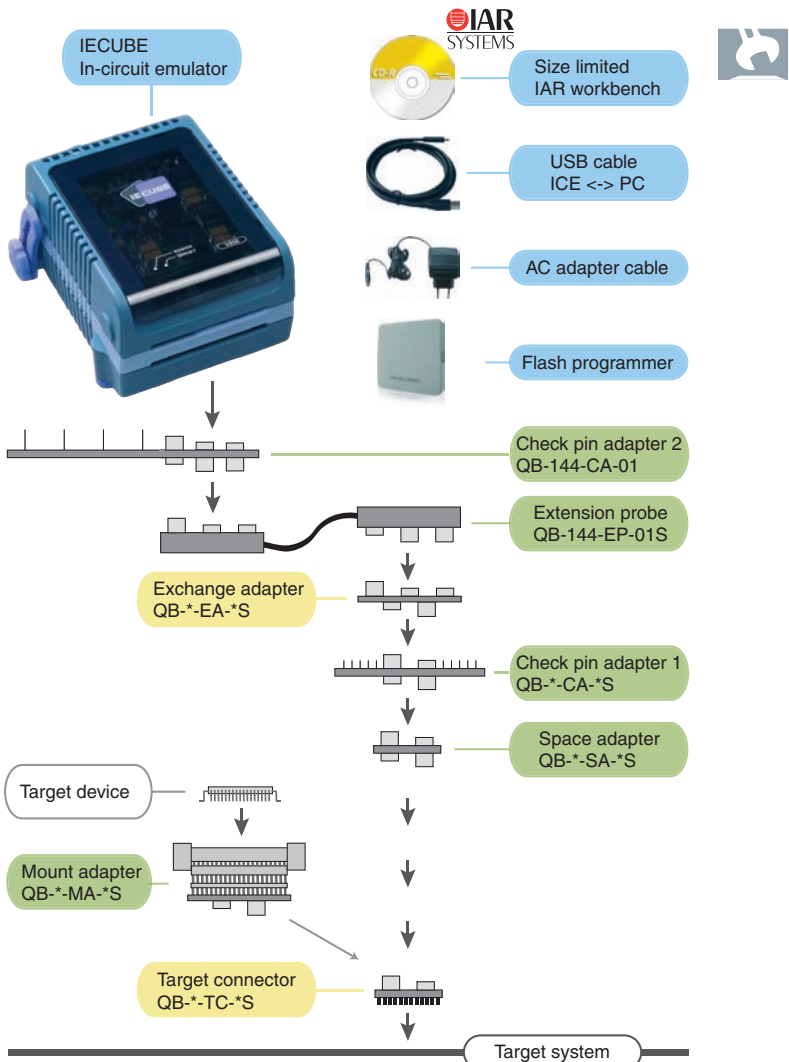
Nickname	MINICUBE	Device adapter
K Series	QB-V850MINI-EE	QB-V850ESKX1H-DA
F Series, H Series		use appropriate OCD device
S Series, J Series		
I Series		
... RS1, MA3, ME2, ME3		



In-circuit Emulation

IECUBE

							
Package	Device Subseries	V850ES/Hx3	V850E / Ix3	V850ES/Ix4	V850ES/Jx3	V850ES/Jx3-L	V850ES/Jx3-H V850ES/Jx3-U
	IECUBE	QB-V850ES/FX3-EE	QB-V850E/IX3-EE	QB-V850EMA3-ZZZ-EE	QB-V850ES/SX2-EE	QB-V850ES/SX2-EE	QB-V850ES/JX3H
64-pin GB	Exchange adapter	QB-64GB-EA-01S					
	Target connector	QB-64GB-TC-01S					
	Mount adapter	QB-64GB-MA-01S					
	Space adapter	QB-64-SA-01S					
	Check pin adapter 1	QB-64-CA-01S	-		-		-
	Check pin adapter 2	QB-144-CA-01					
	Extension probe	QB-144-EP-02S					
	Flash adapter	-					
80-pin GK	Exchange adapter	QB-80GK-EA-02S				QB-80GK-EA-03S	
	Target connector	QB-80GK-TC-01S				QB-80GK-TC-01S	
	Mount adapter	QB-80GK-MA-01S				QB-80GK-MA-01S	
	Space adapter	QB-80-SA-01S				QB-80-SA-01S	
	Check pin adapter 1	QB-80-CA-01S	-		-	QB-80-CA-01S	-
	Check pin adapter 2	QB-144-CA-01				QB-144-CA-01	
	Extension probe	QB-144-EP-02S				QB-144-EP-02S	
	Flash adapter	-				-	
80-pin GC	Exchange adapter		QB-80GC-EA-03S			QB-80GC-EA-04S	
	Target connector		QB-80GC-TC-01S			QB-80GC-TC-01S	
	Mount adapter		QB-80GC-MA-01S			QB-80GC-MA-01S	
	Space adapter	-	QB-100-SA-01S			QB-80-SA-01S	
	Check pin adapter 1		QB-80-CA-01S	-		QB-80-CA-01S	-
	Check pin adapter 2		QB-144-CA-01			QB-144-CA-01	
	Extension probe		QB-144-EP-02S			QB-144-EP-02S	
	Flash adapter		-			-	
100-pin GF	Exchange adapter		QB-100GF-EA-03S	QB-100GF-EA-02S		QB-100GF-EA-01S	
	Target connector		QB-100GF-TC-01S	QB-100GF-TC-01S		QB-100GF-TC-01S	
	Mount adapter		QB-100GF-MA-03S	QB-100GF-MA-02S		QB-100GF-MA-01S	
	Space adapter		QB-100-SA-01S	QB-100-SA-01S		QB-100-SA-01S	
	Check pin adapter 1	-	QB-100-CA-01S	QB-100-CA-01S		QB-100-CA-01S	-
	Check pin adapter 2		QB-144-CA-01			QB-144-CA-01	
	Extension probe		QB-144-EP-02S	QB-144-EP-02S		QB-144-EP-02S	
	Flash adapter			FA-100GF-3BA-A			
100-pin GC	Exchange adapter 1	QB-100GC-EA-01S	QB-100GC-EA-02S	QB-100GJ-EA-02S	QB-100GC-EA-01S	QB-100GC-EA-01S	QB-100GC-EA-04S
	Exchange adapter 2						QB-100GC-EA-05T
	Target connector 1	QB-100GC-TC-01S	QB-100GC-TC-01S	QB-100GC-TC-01S	QB-100GC-TC-01S	QB-100GC-TC-01S	QB-100GC-TC-01S
	Target connector 2						QB-100GC-NQ-01T
	Mount adapter 1	QB-100GC-MA-01S	QB-100GF-MA-01S	QB-100GC-MA-01S	QB-100GC-MA-01S	QB-100GC-MA-01S	QB-100GC-MA-01S
	Mount adapter 2						QB-100GC-HQ-01T
	Space adapter 1	QB-100-SA-01S	QB-100-SA-01S	QB-100-SA-01S	QB-100-SA-01S	QB-100-SA-01S	QB-100-SA-01S
	Space adapter 2						QB-100GC-YS-01T
128-pin GF	Check pin adapter 1	QB-100-CA-01S	QB-100-CA-01S	QB-100-CA-01S	QB-100-CA-01S	QB-100-CA-01S	QB-100-CA-01S
	Check pin adapter 2	QB-144-CA-01	QB-144-CA-01		QB-144-CA-01	QB-144-CA-01	
	Extension probe	QB-144-EP-02S	QB-144-EP-02S	QB-144-EP-02S	QB-144-EP-02S	QB-144-EP-02S	QB-144-EP-02S
	Flash adapter			FA-100GC-8EU-A			
	Exchange adapter 1						QB-128GF-EA-01S
	Exchange adapter 2						QB-128GF-EA-02T
	Target connector 1						QB-128GF-TC-01S
	Target connector 2						QB-128GF-NQ-01T
144-pin GJ	Mount adapter 1						QB-128GF-MA-01S
	Mount adapter 2	-	-		-	-	QB-128GF-HQ-01T
	Space adapter 1						QB-144-SA-01S
	Space adapter 2						QB-128GF-YS-01T
	Check in adapter 1						QB-128-CA-01S
	Extension probe						QB-144-EP-02S
	Flash adapter						-
	Exchange adapter	QB-144GJ-EA-03S			QB-144GJ-EA-01S		
144-pin GJ	Target connector	QB-144GJ-TC-01S			QB-144GJ-TC-01S		
	Mount adapter	QB-144GJ-MA-01S			QB-144GJ-MA-01S		
	Space adapter	QB-144-SA-01S			QB-144-SA-01S		
	Check pin adapter 1	QB-144-CA-01S	-		QB-144-CA-01S		-
	Check pin adapter 2	QB-144-CA-01			QB-144-CA-01		
	Extension probe	QB-144-EP-02S			QB-144-EP-02S		
	Flash adapter	-			-		



- Mandatory
- Optional
- Included in delivery

Software & Dongles

IAR Workbench

- Integrated development environment for V850
 - C/EC++ support
 - Compiler, assembler, linker, debugger, project manager, editor
- Order code: EWV850-FULL-EE



IAR Dongles

- Optional, not mandatory
- Support several installations for a single user
- Easy re-installation after a memory accident on the PC
- Order code:
 - IAR-DONGLE (Parallel port interface)
 - IAR-DONGLE-USB (USB interface)



GHS Workbench

- Integrated development environment for V850
 - C/EC++ support
 - Compiler, assembler, linker, debugger, project manager, editor
- Order code: CPDW9X/NT-CDR-V85X



GHS Dongles

- Optional, not mandatory
- Support several installations for a single user
- Easy re-installation after a memory accident on the PC
- Order code:
 - GHS-DONGLE (Parallel port interface)
 - GHS-DONGLE-USB (USB interface)



Demo / Starter



V850/Hx2 Demonstration Kit

- H Series device
 - uPD70F3707GC
- 100-pin
- 256 Kbytes Flash
- 12 Kbytes RAM
- Single board
- USB cable
- PC connection via USB
- IAR workbench (size limited)
- Order code: EB-V850ES/HG2-EE



V850 - Touch it! Demonstration Kit

- Complete touch controlled TFT user interface reference platform
- V850 All Flash 32-bit MCU board with large embedded Flash
- 3.5" TFT-LCD with touch screen
- Graphic interface sample code for fast evaluation
- Segger RTOS & graphics libraries (evaluation version)
- IAR Embedded Workbench (size limited)
- Order code: V850ES-TOUCHIT



V850/Jx3-L Demonstration Kit

- Main board
 - V850ES/Jx3-L (uPD70F3738GC)
- PC connection and debug via USB
- USB cable timer input/output signals
- 7 segment LED display
- Push buttons for external interrupt generation
- Piezo buzzer
- IAR embedded workbench (code size limited)
- Order code: EB-V850ES/JG3L-EE



V850 ZigBee™ / ZigBee™ PRO Gateway Starter Kits

- 1 x 32-bit ZigBee™ node board
- 1 x 8-bit USB ZigBee™ node programmed with Air sniffer software
- MAC software (object)
- ZigBee™ stack (object)
- Unlimited ZigBee™/ZigBee™ Pro license for V850 family
- GUI tools (SDK)
- TCP/IP libraries and web server
- Sample programs
- IAR compiler kickstart version
- Flash programmer
- Order code ZigBee™ PRO: V850-ZIGBEEPRO-GATE



V850 Ethernet Demonstration Kit

- Main board
- Complete evaluation and development platform for networking and MCU
- Dedicated 32-bit MCU with integrated Ethernet controller
- Multiple communication interfaces, USB, CAN, I2C and UART
- Free TCP/IP stack, web Server and mail client software
- IAR workbench (size limited)
- V850ES/JG3-E · Network it!
- Order Code: V850ES-NETWORKIT



Programming

Flash programmer

- Supports all single voltage Flash devices
- Security flag supports
- 16 Mbytes internal memory for multiple codes
- PC connections via USB and RS-232
- Order code: PG-FP5-EE



MINICUBE 2

- Low price programmer
- Suitable for all single voltage flash devices
- Order code: QB-MINI2-EE



Before purchasing or using any Renesas Electronics products listed herein, please refer to the latest product manual and/or data sheet in advance.

