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	M12p	M12t	M12t+Sat	M12Sat4GNB	M12u
AVAILABILITY	Q1 2018	NOW	NOW	Q2 2018	NOW
USE CASE	Ultra low cost tracker + pico HUMS	Tracker + nano HUMS	Tracker + Automotive + HUMS	Tracker + Automotive + Industrial + HUMS	Industrial controller
Physical location	Urban, rural	Urban, Rural	Urban, Rural, Wilderness	Indoors, Urban, Rural, Wilderness	Industrial
CERTIFICATION	TBD	In progress at UL Labs	In progress at UL Labs	TBD	TBD
SECURITY					
Trust anchor	✓	✓	✓	✓	✓
Anti-tamper	✓	✓	✓	✓	✓
Pre-placed 256 bit unique key	✓	✓	✓	✓	✓
Secure boot	N/A	✓	✓	✓	✓
Encrypted storage	N/A	✓	✓	✓	✓
OTP Key store size (256 bit keys)	4k	500k	500k	1M	500k
RNG	✗	✓	✓	✓	✓
BST QRNG	✗	✗	✗	✓	✓
BST QAnti-Tamper	✗	✗	✗	✓	✓
AES256	✗✓	✓	✓	✓	✓
BST256	✓✗	✓	✓	✓	✓

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SYSTEM					
Main processing element	Lattice XO3-4300	Microsemi M2S005-VFG256	Microsemi M2S005-VFG256	Microsemi M2S010/025-VFG256	Microsemi M2S050/060/090-FGG484
Number of pins	81	256	256	256	484
FPGA logic elements	4300	6k	6k	11k – 26k	50k – 90k
Processor	16 bit micro	Cortex M3 50 MHz	Cortex M3 50 MHz	Cortex M3 166 MHz	Cortex M3 166 MHz
Memory internal SRAM	8kByte	64kByte	128kByte	128kByte	256kByte
Memory external SRAM battery backed	128kByte	128kByte	128kByte	128kByte	128kByte
Memory DDR SDRAM system memory	✘	✘	✘	32Mbyte DDR-SDRAM	32Mbyte DDR-SDRAM
Memory Flash	32kByte	128 Mbyte	128 Mbyte	256 Mbyte	256 Mbyte
Operating system	✘	BareMetal FreeRTOS	BareMetal FreeRTOS,	FreeRTOS, VxWorks	FreeRTOS, VxWorks
OTA updates	✘	✓	✓	✓	✓
PHYSICAL					
Size (mm)	21x29	30x46	40x52x25 IRIDIUM SAT MODEM MODULE 9602	40x70x25 IRIDIUM SAT MODEM MODULE 9602	40x70
Power (run and charge)	5v ~ 6v	5v ~ 6v	5v & 6v ~ 24v	5v & 6v ~ 24v	5v ~ 24v

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battery)					
Built-in Li-ion power charge circuit up to 2.4Ah	✓	✓	✓	✓	N/A
Consumption (active)	<20mW	<100mW	<100mW – 1W (data dependent)	<200mW – 1W (data dependent)	<200mW
COMMUNICATIONS					
GSM/GPRS	✓	✓	✓	✓	✗
3G/4G/LTE NB	✗	✗	✗	✓	✗
Satellite	✗	✗	✓	✓	✗
CAN interface	✗	Option	✓	✓	Dual CAN
SigFox	Option	Option	✗	✓	✗
Bluetooth	✗	✓	✓	✓	✗
Industrial interface	✗	Option	1 x CAN 1 x RS485 1 x RS232	Dual CAN 1 x RS485 1 x RS232	4 x RS485, RS422, Ethernet, RS232, 10 x LVDS
Data speed	56kbps	56kbps - 400kbps	56kbps – 400kbps	56kbps – 100MBPS	9k6 – 20 GBPS
EXPANSION					
I2C	✓	✓	✓	✓	✓✓
SPI	✗	✓	✓	✓✓	✓✓
LVDS	✗	✓	✓	✓✓✓	✓✓✓✓✓✓
Digital	✓	✓✓	✓✓	✓✓✓✓	✓✓✓✓✓✓

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