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SXL Software Release Notes
Merlin 4100/4400/4600 Series

Release SXL-25.04.16.000

Hardware Models	Merlin4100; Merlin4400; Merlin4600 Series
Revision	1.00.14
Approval status	Approved
Date	05 September 2024
Brief description	Details the release of system software SXL-25.04.16.000 for Merlin4100, Merlin4400 and Merlin4600 Series

1 Revision history

Date	Revision	Description
02 November 2021	1.00.00	Release notes for SXL-25.02.14.000
18 November 2021	1.00.01	Release notes for SXL-25.02.14.002
03 March 2022	1.00.02	Release notes for SXL-25.02.14.013
21 March 2022	1.00.03	Release notes for SXL-25.02.14.016
24 May 2022	1.00.04	Release notes for SXL-25.02.14.027
13 October 2022	1.00.05	Release notes for SXL-25.02.14.032
05 January 2023	1.00.06	Release notes for SXL-25.02.80.000
13 February 2023	1.00.07	Release notes for SXL-25.02.99.000
23 March 2023	1.00.08	Release notes for SXL-25.03.23.000
22 May 2023	1.00.09	Release notes for SXL-25.03.43.000
27 September 2023	1.00.10	Release notes for SXL-25.03.43.009
08 December 2023	1.00.11	Release notes for SXL-25.03.43.014
17 July 2024	1.00.12	Release notes for SXL-25.04.08.000
13 August 2024	1.00.13	Release notes for SXL-25.04.13.000
05 September 2024	1.00.14	Release notes for SXL-25.04.16.000

2 Release statement

SXL-25.04.16.000 has formally passed internal acceptance and regression testing and is available for general release on hardware platforms as stated below.

2.1 Firmware information

Filename	Size (bytes)	Build Date	Checksum (md5)
SXL-25.04.16.000.k01.image	19,546,112	28/08/2024	2ad2ea9e464bfb0fbe811d9cc2bad63b

2.2 Hardware platforms

Hardware model	Details
Merlin4100	EN 61000-6 LTE/LTE-450 wireless router with 4 port Ethernet switch (10/100M) with dual use port for RS232 serial or digital input, TPM and secure boot.
Merlin4400	EN50121-4, EN 61000-6 LTE/LTE-450 wireless router with 4 port Ethernet switch (10/100M), TPM and secure boot. Optional dual serial.
Merlin4600	IEC61850-3, EN50121-4, EN 61000-6 LTE/LTE-450 wireless router with 4 port Ethernet switch (10/100M), TPM and secure boot. Optional dual serial, dual SFP (1GbE), USB host, digital IO.

3 Mobile module support

Firmware	Vendor	Module	Region	Cat	2G	3G	LTE
25.03.43.005	Sierra Wireless	WP7702	-	M1	850/900/1800/1900	-	1,2,3,4,5,8,12,13,17,18,19,20,26,28
25.02.80.000	Unitac	ML620DE	-	4			3,7,20,72
25.02.14.027	Sierra Wireless	WP7609-G	Australia	4	-	1,8	1,3,5,8,40,41
	SIMCOM	SIM7070E	-	M	850/900/1800/1900	-	1,2,3,4,5,8,12,13,14,18,19,20,25,26,27,28,31,66,72,85,
	Unitac	ML620EU	-	4	-	-	3,7,20,31,72
		ML660P	-	4	-	-	3,20,87
25.02.14.000	Sierra Wireless	WP7607-G	EMEA	4	900/1800	1,8	1,3,7,8,20,28
		WP7608-G	Asia/Pacific	4	900/1800	2,4,5	2,4,5,12,13,14,17,66
		WP7610-G	North America	4	-	1,5,8	1,3,5,7,8,28

4 Security fixes

Firmware	Module	Description	Severity	Mantis
25.03.16.000	dnsmasq	Updated to version 2.90 Fixes CVE-2023-28450 and CVE-2022-0934	Medium	7796
	dropbear	Updated to version 2024.85	Medium	7560
	frr	Fix CVE-2024-44070. FRRouting (FRR) does not check the actual remaining stream length before taking the TLV value.	High	7858
	password	New HMAC password hashing algorithm which uses the HMAC functionality in the TPM as a means of hashing passwords (IEC62443-4-2)	Low	7155
25.04.13.000	PPP	Updated to version 2.5.0	Low	4179
25.04.08.000	dropbear	Updated to 2022.83	Medium	6403 4976
	System	Delete sensitive information from RAM and generate syslog message after use by luci, uhttpd, PAM, openVPN and strongswan (IEC62443-4-2).	-	7164 7166 7167
	System	Perform image digital signature verification in virtual memory prior to loading to flash when using to Web UI and Activator.	Low	6721

	uhttpd	Support TLS v1.3 (IEC62443-4-2).	-	6854
25.03.43.005	console	Automatically log out console sessions after 30 mins if inactivity	Low	6884
25.03.23.000	telnetd	Remove telnetd support	Medium	
	password	Resetting password via web UI now requires input of current password	Low	5261
	SSH	Added grace period after console login failure to disrupt brute force attacks	Medium	5853
25.02.80.000	dnsmasq	Updated to 2.85 (CVE-2021-3448)	-	6041
	gpsd	Updated to 3.23.1	-	
	overlay	Implemented automatic overlay clean up to remove ad hoc modifications	-	5374
	snmpd	Application now runs with dedicated unique user and group id instead of root privileges	-	4695

5 Security vulnerabilities

Module	Short Description	Severity	Mantis
net-snmpd	requires update from v5.7.3 to v5.9.4 to fix known vulnerabilities: CVE-2022-44793; CVE-2020-15861; CVE-2020-15862; CVE-2019-20892; CVE-2015-8100; CVE-2018-18065; CVE-2018-18066; CVE-2014-2285	Medium	7306

6 New features

Mobile				
LTE power saving mode	Support LTE PSM mode for SIMCom7070E mobile module			7841
	Package	Section	Options	
	mobile	mobile	sim1_enable_psm; sim2_enable_psm	
System				
TPM hashed password	Support new HMAC hashing algorithm for hardware with a TPM. This allows the user to use the HMAC functionality in the TPM as a means of hashing passwords. This is opposed to existing md5 or sha512 hashes and prevents a malicious actor from decrypting as the hashes now require the TPM hardware to be calculated			7155
	Package	Section	Options	
	system	system	password_hash_algo 'hmac'	

7 Deprecated features

Firmware	Package	Description	Mantis
25.04.08.000	mobile	Deprecated PPP mode for Quectel and Sierra Wireless modules	7337 7517
		Deprecated Quectel EC20 mobile module support	7337
	strongswan	`strongswan.connection.authby` deprecated. Now supported by new options `localauth`; `localauth2`; `remoteauth`; `remoteauth2`	6294
	X25	Deprecated `x25d`, `x25ipd` and `x25val` packages	7467
25.02.14.013	network	Configuration section `va_switch` deprecated. Ethernet configuration should be done using option `ifname` configured with driver port names	
	wireless	wireless.wifi-device.type option deprecated	

8 Known issues

Module	Short Description	Mantis
Firewall	Firewall zone with name longer than 12 characters breaks NAT	7791
OSPF	When the remote connection (from a remote OSPF peer) is dropped, OSPF crashes intermittently.	5677
Strongswan	Strongswan memory footprint increases slowly with tunnel restart	5866
Syslog	No web UI support for syslog filter rules	3705
Web	Web intermittently failing to load when WeConnect is active	7808
Web/IPsec	Unable to configure `strongswan.connection.disable_mobike`, `strongswan.connection.mobike_send_additional_self` or `strongswan.connection.disable_natt` via web UI	5437
Web/Management Users	Unable to configure management users via web UI	5503

9 Problems resolved

Module	Short Description	Mantis
Data Usage	Fix mobile phy detection on data usage start using faster processors	7865
Ethernet	Fix Ethernet ports intermittently reflecting incorrect state when bridging	7795
Mobile	Fix band selection for SIMCom7070E module	7833
	Fix SIMCom7070E module establishing data connection	7821
	Fixes to ensure APN information is set properly for Sierra Wireless radio modules	7777 7797
	Fixes to ensure the manual network operator selection is executed in the right order	7797

	Log a warning that GNSS is not supported for SIMCom7070E mobile module	7822
Monitor	Fix mobile phy detection on monitor start using faster processors	7863
		7864
Multiwan	Fix crash caused by incorrect mobile phy detection on start up using faster processors	7835
	Produce warning for interfaces that do not exist	7857
System	Replace invalid spaces in hostnames with '-' at run time	7829
TPM	Fix error message when `tpm-cli flush` command is executed twice in a row	6010
Web	Prevent capitalisation of configuration section names	7856

10 Appendix 1: New features history

10.125.04.13.000

Console		
Console disable	Support new option for disabling the console port Package Section Options system failsafe console	7802
Mobile		
SKU display	Add display of Sierra Wireless module SKU to mobile diagnostics	7155
PPP		
Adaptive LCP Echo	When enabled LCP echo will only be sent if no traffic is received on the interface. This avoids the situation where PPP is be terminated on a congested PPP link because LCP echos are not received in time (Mantis: 4179) Package Section Options network interface adaptive_keepalive	4179
System		
Change Log	Change log now records active image number and version on reboot	7728
Merlin4400 series without serial	Added support for Merlin4400 series with no serial interface	7722
Merlin4600 dual mobile	Added support for Merlin4600 series with dual mobile	7714
Merlin4700 with SFP	Added support for Merlin4700 with additional SFP/Ethernet port	7717
Port mirroring	Support software port mirroring. All ingress and egress traffic on an interface can be mirrored to an alternate interface Package Section Options network interface mirrorto	7969
Change Log	Change log now records active image number and version on reboot	7728
Merlin4400 series without serial	Added support for Merlin4400 series with no serial interface	7722

10.225.04.08.000

AT Command Service

AT Command Service	New router application that acts as a PSTN modem emulator/AT command interpreter. It converts PSTN data calls from asynchronous serial to TCP/IP.		
	Package	Section	Options
	crsd	main	see user manual
		route	
		translate	

Dual user serial/digital input port

Merlin4400 support	Merlin4400 series now supports a dual use serial/digital input port	7214

Management Users

User groups	Support new group configuration which contains a list of `allowed_pages`. A user can be assigned to multiple groups. This allows a user to be able to visit pages from their own `allowed_pages` as well as from any assigned groups			7158
	Package	Section	Options	
	management _user	user	groups	
		group	enabled; allowed_pages	

Mobile

Airplane mode in backoff	Support new option to enter Airplane Mode during the interface back off period			7032
	Package	Section	Options	
	network	interface	airplane_mode_backoff	
SMS security	Improvements to SMS queue processing and support new options for better control how SMS messages are handled			3976
	Package	Section	Options	
	mobile	mobile	sms_read_interval; sms_check_time; sms_past_margin; sms_future_margin	
SMS whitelisting	Support whitelisting commands allowed to be executable by SMS			6931
	Package	Section	Options	
	mobile	caller	allowed_commands	
Watchdog timeout behaviour	Support advanced configurable action [`log|reset|reboot`] to take when a watchdog timeout occurs for a mobile module. Currently only supported for QMI modules			5719
	Package	Section	Options	
	mobile	main	netdev_wd_action	

OpenVPN

TPM support	Support OpenVPN keys in TPM. The existing key option should be configured to the TPM label for the OpenVPN key			7126
	Package	Section	Options	
	openvpn	openvpn	keytype; key '<TPM-label>'	

Password Management			
Multi Factor Authentication	SSH and web UI now support Multi Factor Authentication using Google authenticator		5339 7152 7154
	Package	Section	Options	
	dropbear	dropbear	multi_factor_auth	
	luci	main	multi_factor_auth	
Password lifetime	Support password lifetime configuration for management users. Does not apply to root password		7156
	Package	Section	Options	
	managemen t_user	user	max_passwd_age	
Password regex	Support configuring password regex rules. Applies to root password and management users password		7194
	Package	Section	Options	
	system	main	password_regex	
Password reuse	Support limiting password re-use of the last 10 management user passwords. Does not apply to root password		
RADIUS			
NAS-Identifier option	Support new configuration option for NAS-Identifier with support for %serial and %hostname option values		7347
	Package	Section	Options	
	system	pam_auth	radius_nasid	
Scada			
AI Scaler	Extended AI scaler support iecd.port.ai_scaler for DNP3 slave to Modbus master conversion. The analog inputs received from the RTU are divided by the scaler before conversion to SCADA protocol. Previously only DNP3 to IEC104 supported. AI scaler now supports both divisor and multiplier		7278 7506
	Package	Section	Options	
	iecd	port	ai_scaler_op	
Critical process support for IECD	IECD now added to list of critical processes that are automatically restarted		7294
DNP3 group 40 analog output variation	Added support for DNP3 slave group 40 analog output variation		7548
	Package	Section	Options	
	iecd	port	dnp3s_g40_variation	
DNP3 relay type	Support new configuration option for specifying command point relay type		7512
	Package	Section	Options	
	iecd	cmdpoint	dnp3_relay_type	
IEC101RTR TCP Server Mode	Support TCP Server Mode for IEC101RTR IEC101 connection		6992
	Package	Section	Options	
	iec101rtr	link101	listen_ip, listen_port	

IEC104 command point IOA	New configuration option for IEC104 master command point information object address			7579
	Package	Section	Options	
	iecd	cmdpoint	iec104m_cmd_ioa	
IEC104 to DNP3 double command conversion	New option values [4|5] added to `iecd.port.dnp3_app_output_mode` option that determine behaviour when an IEC104 command with S/E bit is received			7423
MQTT Azure DPS	Added support for MS Azure's IOT hub Device Provisioning Service (DPS)			7028
	Package	Section	Options	
	iecd	port	see user manual	
MQTT read specific data point	MQTT can now be configured to read specific data points			
Modbus bitmap	Support bitmap handling in Modbus master			7371 7473
	Package	Section	Options	
	iecd	point	mb_bitmask	
Modbus data formats	Extend supported data format values for MODBUS data points			6890
	Package	Section	Options	
	iecd	point	mb_data_fmt; modbus_data_fmt	
Modbus DI inversion	Support DI inversion for Modbus master			7507
Modbus dual data point handling	Support dual data and command point handling for IEC104 slave to Modbus master conversion. Two Modbus registers can now be converted into a single DPI			7475
	Package	Section	Options	
	iecd	port	modbus_dual_io; modbus_index2	
Modbus frame retransmit counter	Added configuration for MODBUS master frame retransmit count			
	Package	Section	Options	
	iecd	port	modbus_max_retries	
New VHMI payload types	Add support for sending publish messages via MQTT using different payload formats			
	Package	Section	Options	
	iecd	port	vhmi_mqtt_payload_fmt; vhmi_mqtt_client_name; vhmi_mqtt_site_name	
SCEP				
TPM support	SCEP now supports key pair management in TPM			7125
	Package	Section	Options	
	strongswan	scep_cert	use_tpm; key_label	
SNMP				
Multiwan state OID	Added ifMultiwanState to VA-UCI-MIB			6915
Sim detection OID	Added SimIn to VA-MODEM-MIB			6915

SSH				
Limit concurrent users	Support new option for limiting concurrent authenticated user sessions (Mantis: 7160)			7160
	Package	Section	Options	
	dropbear	dropbear	MaxConnections	

Strongswan				
IKEv2 Multiple subnet support	Support multiple subnets for ikev2			6026
	Package	Section	Options	
	strongswan	connection	locallanextra; remotelanextra	
TPM support	Support strongswan keys in TPM. TPM keys are supported via the `token` secret type. In this case the value of the secret specifies the label of the key to use.			4460
	Package	Section	Options	
	strongswan	secret	secrettype 'token'; secret '<TPM-label>'	
XAuth EAP support	Added support for xauth-eap and eap-radius authentication methods			6294
	Package	Section	Options	
	strongswan	connection	localauth; localauth2; remoteauth; remoteauth2	
		radius_server	enabled; address; secret; auth_port; acct_port	

System		
Busybox	Enable support for `who` command	6788
Firmware	Prohibit downgrading router firmware on models using Sierra Wireless Toshiba NAND flash to an unsupported version (< 25.03.43.014)	7488
Syslog	New warning message generated to local and remote syslog when any entries stored locally are discarded due to log rotation (Mantis: 7162)	7162

Terminal Server		
Show configuration CLI command	Added support for display of running terminal server configuration CLI command `cli: show config`	6893

VA Events				
802.1x events	VA Event System now supports `ieee8021x` event class and events			6528
	Id	Name	Severity	Event Template
	1	IEEE8021xRestrictingIf	notice	IEEE8021x restricting on %{p1}
	2	IEEE8021xAllowingAllon If	notice	IEEE8021x allowing all on %{p1}
	3	IEEE8021xAllowingMAC onIf	notice	IEEE8021x allowing %{p1} on %{p2}
	4	IEEE8021xBlockingMAC onIf	notice	IEEE8021x blocking %{p1} on %{p2}

Web UI	

Disable web UI	Added new option to disable web UI			7068
	Package	Section	Options	
	uhttpd	main	webui_enabled	
Limit concurrent users	Support new option for limiting concurrent user sessions			7161
	Package	Section	Options	
	luci	sauth	sessionlimit	
LTE band display	Show supported LTE bands for enable/disable via Web UI. `web: services->mobile manager->lte`			
Session control	Added utility to list and terminate web sessions (Mantis: 7159) `web: system->sessions` `cli: sessionctl`			7159
Web UI theme	New restructured web UI with navigation links on left side frame.			

WeConnect	
DCU VPN Concentrator Support	Added support for DCU VPN Concentrator to WeConnect

10.325.03.43.014

General	
Sierra Wireless	Added support for new Sierra Wireless NAND flash (Toshiba TC58NYG2S0H). Note: Routers running this Sierra Wireless flash version require v2.6 bootloader and cannot be rolled back to firmware prior to 25.03.14.014.

10.425.03.43.009

Certificates	
Check both TPM and flash for certificate key	If the key cannot be found in the location specified in the configuration file, the router will automatically check an alternate location using the following methodology (Mantis: 6820). • When configured for **PEM** key and key cannot be found at the configured location, the router will try to use a TPM key with name corresponding to base file name (/etc/uhttpd.key -> "uhttpd"). • When configured for **TPM** key and key cannot be found in the TPM, the router will try to use file "/etc/<tpm label>.key"

Mobile	
FOTA support for Unitac modules	Support FOTA upgrade for Unitac modules
Neighbour cell information	Added display of neighbouring cell information. Currently only supported on Unitac ML620/660 and Quectel EC200x series `cli: vam -n`

Sierra Wireless WP7702 LTE-M support	Added support for Sierra Wireless WP7702 LTE-M1/NB1 mobile module on Merlin series

Multiwan

Multiwan upper retry limit for roaming interfaces	For 3G roaming connections, and connections with `retry_on_first_fail` enabled, to avoid getting stuck on one SIM, a new Multiwan configuration parameter defines the maximum number of seconds to stay with an interface after its first failure before proceeding. (Mantis: 6975) `cli: multiwan.interface.retry_connection_max_sec (def: multiwan.interface.ifup_timeout_sec)`

Power over Ethernet

PoE port stop/start	Power over an individual Ethernet port can now be stopped and started via the PoE status page on the web UI (Mantis: 6827) `web: status->PoE`

SCADA

DNP3 Analog Set point command variation	Added new option for DNP3 Analog Set point command variation		
	Package	Section	Options
	iecd	cmdpoint	dnp3_cmd_variation (def: 0)
MODBUS to Remote IO protocol conversion	Added support for MODBUS to Remote IO (ioservd) protocol conversions (Mantis: 6886)		
Update IEC104 master on DNP3 static variation change	Added new feature to transmit a spontaneous update to IEC104 master on DNP3 static variation value change		
	Package	Section	Options
	iecd	port	dnp3_tx_spont_on_static_change (def: 0)

TPM

List TPM keys	Support new diagnostic command to list TPM keys `cli: tpm-cli listkeys`

10.525.03.43.000

General

Merlin4100 support	Added support for Merlin4100 series

GPS

GPS MIB support	Added support for `VA-GNSS-MIB` for retrieval of GPS values

Network

Dummy interface support	Added support for dummy interfaces. Dummy interfaces are real kernel interfaces (unlike alias interfaces) and support all the configuration options of a static interface. Dummy interfaces are useful in combination with VRFs as they can be isolated from general routing.		
Ignore carrier state option	Support new option for static protocol interfaces to ignore carrier state changes. This allows interfaces to stay permanently up even when physical connection is not present (Mantis: 6739)		
	Package	Section	Options
	network	interface	ignore_carrier_state (def: no)
System			
IP PAD support	Added `padd` and `vald` packages for IP PAD support for converting legacy X.25 serial communication over TCP/IP.		
SCADA			
MODBUS to Remote IO protocol conversion	Added support for MODBUS to Remote IO (ioservd) protocol conversions (Mantis: 6886)		
Serial to UDP multi-point mode	Added support for multiple UDP peers on serial port. Data received on a serial port is transmitted to all peers; data received from any peer is transmitted on the serial port. Up to 8 UDP peers supported (Mantis: 6723)		
	Package	Section	Options
	tservd	port	udpMultiPointOn (def: no); remote_ipX; udpRemotePortX

10.625.03.23.000

Roaming Manager			
Roaming Manager connection retry options	Added new connection retry options for Roaming Manager feature		
	Package	Section	Options
	network	interface	roaming_link_success_time (def: 600 secs); roaming_prefer_best_operator (def: no); roaming_scan_inheritance (def: no)
	multiwan	interface	retry_on_first_fail (def: no)
SCADA			
MODBUS TCP routes	Added support for MODBUS TCP routes (Mantis: 6643)		
	Package	Section	Options
	iecd	mbtcp_route	ifnum; devaddr, ipaddr
IECD104 Slave cyclic transmission	Support for cyclic transmission of data point messages		
	Package	Section	Options
	iecd	port	iec104_cyclic_on (def: 0)
Transparent mode offline queue	Added support for IEC104 slave offline queue when using transparent mode (no iec104s application layer)		

	Support for binding IEC104 Slave socket to a VRF for isolation from general routing (Mantis: 4802)		
VRF	Package	Section	Options
	iecd	port	iec104_ip1_vrf; iec104_ip2_vrf; iec104_ip3_vrf; iec104_ip4_vrf; iec104_ip5_vrf; iec104_ip6_vrf;

System			
GNSS time synchronisation	Added support for time update via GNSS.		
	Note: Router requires GNSS capabilities and GNSS is enabled (Mantis: 6229)		
	Package	Section	Options
	system	timeserver	gnss_clock_source_enabled (def: no)

10.725.02.99.000

Mobile	
FOTA upgrade via CURL	FOTA upgrade can now use CURL to download a firmware image from remote location

SCADA	
IECD61850 Slave to MODBUS Server	Added support for IEC61850 slave to MODBUS Server
IEC62351-3 TLS - CRL/OCSP Automated Fetching	Added support for CRL/OCSP automatically fetching from a link provided within the certificate. Previously implementation only used a local file (Mantis: 5955)
New IECD diagnostics	Added new command line diagnostics to show all possible point and cmdpoint options (Mantis: 6556)

```
cli: iecd show point options
cli: iecd show cmdpoint options
```

10.825.02.80.000

BGP	
BGP MIB support	Added BGP-4-MIB support so BGP information can be retrieved via SNMP (Mantis: 6347)

FXS			
Analogue gain	Added options to store FXS card gain		
	Package	Section	Options
	fxs	interface	rx_analogue_gain (def: 0.0); tx_analogue_gain (def: 0.0)

General	
Merlin4400 support	Added support for Merlin4400 series

Sierra Wireless	Added support for newer Sierra Wireless NAND flash. Note: Routers running newer Sierra Wireless flash cannot be rolled back prior to 25.02.80.000

GPS

GPS diagnositics	Added new `gps` diagnositics command

SNMP

LAPB MIB support	Added support for Virtual Access VA-LAPB-STATS-MIB which provides level 2 statistics for the serial interface (Mantis: 4695).
Modem firmware version MIB support	Virtual Access VA-MODEM-MIB modemTable now supports `modemFirmwareVersion` and `modemGsmLtePci` (Mantis: 5912)
VA roaming manager MIB support	Added MIB support for VA Roaming Manager (`vaRoamingManagerModule`) feature to VA-MODEM-MIB (Mantis: 5842)

Mobile

EID retrieval	Support EID retrieval for Quectel, Simcom, Sierra Wireless, Huawei and Telit mobile modules. EID information on the SIMs can be displayed using `vam -a` command (Mantis: 6236)
FOTA upgrade	Support Quectel FOTA upgrade via locally stored file

Monitor

LTE band and cell diagnostics	Added support for LTE band and cell information in ISAD bins (Mantis 6007)
VRF support for monitor keepalive	Added support for configuration of VRF domain for Monitor keepalive traps (Mantis: 5983)

Package	Section	Options
monitor	keepalive	vrf

Multiwan

Multiwan interface scanning timeout	New multiwan config parameter to extend `ifup` timeout when a mobile roaming operator scan is active. Used in conjunction with VA Roaming Manager feature, this parameter is added to the normal `ifup_timeout_sec` used for `ifup` operations whenever the ifup occurs during a 3G operator background scan, or the ifup itself triggers such a scan, on the modem being used for the current interface.

Package	Section	Options
multiwan	interface	ifup_scanning_timeout_sec (def: 480 secs)

SCADA

DNP3 to IEC104 DI inversion and AI Scaling	Added support for inversion of single bit binary input points (Gr1, Gr2) for DNP3 RTU's to IEC104 Scada master. In addition, added support for a new an option for analog scaling – the analog inputs received from the RTU are divided by the scaler before conversion to SCADA protocol (mantis: 6419)

Package	Section	Options
iecd	port	di_invert (def: 0); ai_scaler (def: 0)

Health points in multi master mode	Added support for health points (6) in multi-master mode		
	Package	Section	Options
	iecd	port	iec104_rtuX_health_ioa;
HMI second interface	Added support for HMI Second Control Interface (MQTT)		
	Package	Section	Options
	iecd	port	modbus_slave_devaddr; modbus_slave_protocol; modbus_slave_local_ip; modbus_slave_tcp_port (def: 502); modbus_slave_serial_ifnum; modbus_slave_use_tls; modbus_slave_tls_cacertfile; modbus_slave_tls_crlfile; modbus_slave_tls_certfile; modbus_slave_tls_keyfile; modbus_slave_tls_pass; modbus_slave_tls_common_name; modbus_slave_tls_validate_peer_cert; modbus_slave_tls_verify_depth; modbus_slave_tls_force_tls1_2; modbus_slave_tls_cipherlist
IOSRVD direct serial comms	Support IOSRVD interface to serial using direct driver calls instead of UNIX sockets to tservd (Mantis: 6322)		
	Package	Section	Options
	iecd	port	modbus_serialX_mode; modbus_serialX_speed; modbus_serialX_wsize; modbus_serialX_parity; modbus_serialX_stops (where X is 0 or 1)
IOSRVD MQTT	Added support for remote IO and MQTT slave (Mantis: 6315)		
MODBUS master side analog filtering	When IECD is configured to communicate with a modbus slave, it can receive updates of register values that are modelling analog inputs (Holding Registers and/or Input Registers). Since analog values can be 'noisy' in nature, these updates can be quite frequent. If it is desired to limit the frequency of these updates, it is now possible to apply per data point filtering of analog values.		
	Package	Section	Options
	iecd	point	modbus_filter_mode; modbus_filter_db_val; modbus_filter_sampling_time_secs; modbus_filter_transmit_time_secs
MODBUS slave to Modbus master TCP data conversion	Support Modbus slave to Modbus master TCP conversion (Mantis: 6047)		
	Package	Section	Options
	iecd	port	modbus_slave_devaddr; modbus_slave_protocol; modbus_slave_local_ip; modbus_slave_tcp_port (def: 502); modbus_slave_serial_ifnum; modbus_slave_use_tls; modbus_slave_tls_cacertfile; modbus_slave_tls_crlfile; modbus_slave_tls_certfile; modbus_slave_tls_keyfile; modbus_slave_tls_pass; modbus_slave_tls_common_name; modbus_slave_tls_validate_peer_cert; modbus_slave_tls_verify_depth; modbus_slave_tls_force_tls1_2; modbus_slave_tls_cipherlist

MQTT ofline queue	Added support for MQTT offline message queue for stroring publich mesagees in memory while MQTT broker is offline.		
	Package	Section	Options
	iecd	port	mqtt_offline_q_on (def: 0))
MQTT payload logging	Added payload logging for MQTT publish (Mantis: 6317)		
	Package	Section	Options
	iecd	port	mqtt_debug_on (def: 0)
MQTT Slave to Modbus conversion	Added support for MQTT slave to Modbus protocol conversion (Mantis: 6319)		
RTU test emulator	Added support for VRTU (RTU Test Emulator) for pre-production SCADA connectivity and operations testing (Mantis: 6225)		
	Package	Section	Options
	iecd	port	vrtu_simulation_interval_sec (def: 30)
Windows file format data point import	Support windows .xlsx extension for data point files import (Mantis: 6027)		

10.925.02.14.032

No new features

10.10 25.02.14.027

General	
Merlin4600 Sierra Wireless WP7609-G support	Due to differing versions of Sierra Wireless WP7609G Australia module this release marks official support for WP7609G in Merlin4600 series (Mobile code: PFJ) for all versions.
	Note: Do not downgrade the Merlin4600 (PFJ) variant to firmware prior to SXL-25.02.14.027.
Mobile	
EID retrieval using SIMCOM 7070E	The SIMCOM 7070E mobile module can now report EID information on the SIMs using vam -a command (Mantis: 6236)
LTE-450 mobile module support	Merlin4600 series now supports an alternate mobile module via PCIe slot in order to support frequency bands not support by the on board Sierra Wireless radio, in particuar LTE-450 bands 31, 72 and 87 using Unitac and SIMCOM 7070E modules.

10.11 25.02.14.016

DI/DO	
Digital Input	Merlin4600 series digital input values changed to match GW2020 series for compatible SCADA operation

Input value	State
0	Input not detected / open / low
1	Input detected / closed / high

10.12 25.02.14.013

Ethernet	
Ethernet port to interface mapping using port names	Ethernet interface configuration now uses driver port names in option ifname rather than `va_switch` configuration section for mapping interfaces to Ethernet ports. The `va_switch` method used in other hardware models is now deprecated for Merlin4600 series. Use space separator when specifying multiple port names in option ifname.

When bridging Ethernet ports option type must be set to 'bridge' (Mantis 6028)

Physical port label	network.interface ifname value
Ethernet A	portA
Ethernet B	portB
Ethernet C	portC
Ethernet D	portD
SFP I	portI
SFP J	portJ

Example bridged configuration:

```
package network
config interface 'LAN'
        option ifname 'portA portB portC portD'
        option type 'bridge'
```

Example segmented configuration:

```
package network
config interface 'LAN1'
        option ifname 'portA portB portC'
        option type 'bridge'
config interface 'LAN2'
        option ifname 'portD'
```

SCADA	
Allow commands to work without status points	Setting option `iec104_status_ioa` in a `cmdpont` section to 0 makes the IECD ignore the feedback point, but the commands still work. (Mantis: 5981)

IEC104 Double Bit command conversion to two DNP3 single commands	Setting option `iec104_status_ioa` in a `cmdpont` section to 0 makes the IECD ignore the feedback point, but the commands still work. (Mantis: 5981)
IEC104 multi master support	The IEC104 slave now supports up to 6 SCADA masters that can control the same RTU. In a normal scenario there is a single IEC104 SCADA master connecting to the router. It may sometimes use several TCP concurrent connections, however only one connection is active and transferring data at a time. All configured data points are sending data to the same connected IEC104 master. In some scenarios it may be necessary that several IEC104 SCADA masters are polling and controlling the same RTU concurrently. Moreover, it may be desirable that one master polls or receives data from a specific set of data points (identified by IOAs (information object addresses)) while another master polls a different set of data points within the same RTU. (Mantis: 6012)

Package	Section	Options
iecd	port	iec104_multi_master_on (def: 0);
		iec104_conn1_casdu; iec104_conn2_casdu; iec104_conn3_casdu; iec104_conn4_casdu; iec104_conn5_casdu; iec104_conn6_casdu; iec104_local_ip1; iec104_local_ip2; iec104_local_ip3; iec104_local_ip4; iec104_local_ip5; iec104_local_ip6; iec104_local_tcpport1; iec104_local_tcpport2; iec104_local_tcpport3; iec104_local_tcpport4; iec104_local_tcpport5; iec104_local_tcpport6
	point	iec104_conn_mask
	cmdpoint	iec104_conn_mask

Modbus HMI support	VHMI (Virtual HMI) is a human machine interface exposed to an externally connected software. Current version supports only Modbus TCP protocol for the connection to the HMI software. The router acts as a Modbus TCP slave/server. External HMI software is a Modbus TCP master/client. When VHMI is enabled, the Modbus TCP client can poll the values of all data point objects in parallel to normal protocol conversion process. (Mantis: 6040)

Package	Section	Options
iecd	port	vhmi_enabled (def: 0); vhmi_proto (def: modbus_tcp); vhmi_listen_port (def: 502); vhmi_debug_on (def: 0)
	point	vhmi_on (def: 0); vhmi_regaddr (def: 0); vhmi_dword (def: 0)

Support CP24 timestamp format messages in IEC101 to 104 conversion	IEC101 Type ID 2, 4, 6, 8, 10,12,14,16 now supports CP24Time2a (Mantis: 5980)

Support Regulating Step and Bitstring commands for IEC101 to IEC104 conversion	Added IEC101 to IEC104 conversion support for commands (Mantis: 6030): • C_RC_NA_1 Regulating step • C_BO_NA_1 Bitstring of 32 bit

Strongswan	
SCEP certificate debug level	The SCEP client natively supports debug options with 4 levels levels - 0,1,2,3 and 4. These can now be configured using new config option `debug_level`. Set to 0 to disable. (Mantis 5881)

Package	Section	Options
strongswan	scep_cert	debug_level (def: 0)

SCEP cert user option	New SCEP config option user which is the high-level concept of the user of the cert. It gets read access via its group. The owner is root, the group is the user. The user is expected to be a member of its group. User certs are stored in `/etc/certs` tree (Mantis: 5913).

Package	Section	Options
strongswan	scep_cert	user (def: strongswan)

10.13   25.02.14.002

No new features

10.14   25.02.14.000

Hardware	
Digital IO	Support for • Six digital input ports with Wet/Dry control • Two digital outputs An event is raised in the router's syslog when the status of the digital input changes. The routers event system can be used to forward the events to a Syslog Server, SNMP, email or SMS.
SFP	Support for two 1Gbps SFP ports using physical ports I and J. Ports can operate with Ethernet or Fibre adapters and are internally configured as standard Ethernet interfaces
Trusted Platform Module (TPM)	A Trusted Platform Module (TPM) is a microcontroller-based chip, which provides hardware-based security for the user's data, cryptographic keys, and safeguards confidential information. The Merlin hardware comes with a set of keys that are burned to the TPM's memory fuse and cannot be changed. These keys are used to produce a set of keys that act as local Root of Trust. These can then be used by a variety of system processes and for data exchanges. This digital signing process ensures the highest level of identity verification.

SNMP	
Last Gasp	Power fail event generated in syslog and optionally delivered using the routers event system via an SNMP trap when power is lost.

SCADA		

SCADA applications	Support for SCADA protocol conversion suite.	
	Web	**Package**	**Description**

Web	Package	Description
DNPOSD	dnposd	DNPOSD is a SCADA application which emulates a DNP3 controlled station and presents status of monitored interfaces and device information as DNP3 objects
IEC101MON	iec101mon	IEC101MON is a router application that monitors IEC 60870-5-101 link and forwards the decoded messages over MQTT
IEC101RTR	iec101rtr	IEC101RTR is a SCADA protocol conversion application which acts as IEC101 Slave and converts SCADA traffic to IEC104 Master
IECD	iecd	IECD is a SCADA protocol conversion application supporting many SCADA protocols: IEC 60870-5-104, IEC 60870-5-101, IEC61850, DNP3, Modbus, MQTT
IOSRVD	iosrvd	IOSRVD is a router application working with IECD to communicate to Remote IO devices
Modbus Gateway	modbus_gw	Modbus Gateway SCADA protocol conversion application which acts as Modbus Slave and converts SCADA traffic to IEC104 Master
RTUD	rtud	RTUD allows the remote SCADA master to monitor and control the digital IOs of the Virtual Access router that acts as the RTU slave. RTUD supports IEC 60870-5-104, DNP3 and Modbus.

Security	

Last Gasp	Power fail event generated in syslog and optionally delivered using the routers event system via an SNMP trap when power is lost.

WeConnect	

WeConnect	WeConnect allows secure remote access to both the network behind the devices and the devices themselves. WeConnect solves the complexity of managing VPNs over the Internet. With WeConnect users can easily and securely connect to any IP-device on the network using their normal PC, smartphone or tablet.
	If you do not yet have an account, contact your local Westermo reseller or visit weconnect.westermo.com for further information.

11 Appendix 2: Problems resolved history

11.125.04.13.000

Module	Short Description	Mantis
Mobile	Fix Sierra Wireless module FOTA upgrade CRC32 checksum calculation	7724
OpenVPN	Don't create new `linux` and `uci` interface on openvpn restart	7735
System	Fix minimum machtype firmware version checking	7717 7722 7714
	Fix misleading 'cannot find device' messages on network restart or `ifup`	7798
Web	Fix issue socket closing before HTTP data is complete which can result in UI not displaying correctly	6738 7752
Web/Realtime Graphs	Fix display of Realtime Graphs for mobile interfaces `web: status->Realtime Graphs`	7029
WeConnect	Add missing `ripd` and `openvpn` packages during provisioning	7687 7688
	Network status diagnostics now correctly show WeConnect interface IP address	7682

11.225.04.08.000

Module	Short Description	Mantis
802.1x	Fix 802.1x authentication	4290 7464
	Fix 802.1x restart after `ifup` or cable unplug/plug	7530
Activator	Fix issue with multiple downloads from different services (active update, inventory, audit) running simultaneously	6321
Boot	Improve power-on sequencing for USB hub on GW2124P and Merlin series	
Cwatch	Change Cwatch 'Interface does exist' message to `NOTICE` severity	7078
DHCP	Fix corrupted IA address when sending `OPTION_IA_N`	7424
Event System	Correctly handle double quotes in event target `cmd_template` value	5736
	Fix `va_event` syslog messages showing with no space between date and serial number	7513
GRE	Validate configured keys are unique	6769
HTTP Client	Include all CPUs in interrupt count value in `hdl` request field `irq_cnt`	6228
IECD	Added timestamp to `iecd show stats` diagnostics command	7339
	Enhancement to `iecd show config` command to show full config and not just main section	6894
	Fix clock sync time in IEC101 `force_clock_sync` to use local time instead of UTC	7208
	Fix error in converting clock value from IEC104 to UTS seconds	7022

	Fix excessive logging of DNP3 point updates	7521
	Fix serial interface name selectors for DNP3, Modbus and IEC101 to match physical port names	7180
	IEC104 to IEC101 health point now correctly sent to IEC104 master when IEC101 data link gets established	
	Improvements to IEC104 Setpoint to DNP3 Analog Output conversion	7015
IECD/ Modbus	Added bitmap handling for DI register type in Modbus master	7371
	Extend supported data format values for MODBUS data points	6890
	Fix event generation of unsolicited messages for Modbus master (serial) to DNP3 salve (TCP) when DNP3 Unsolicited Messages option is enabled in configuration	7335 7526
	Fix issue with detection of serial interface names on Merlin4400 causing inconsistency with `iecd.port.modbus_serial_ifnum` option	7051
	Fix issue with IEC104 to Modbus AI scaling	7375
	Fix missing display of point value in Web UI for Modbus to MQTT	7189
	Fix support for conversion of Modbus slave to DNP3 master	7186
	Fixed MODBUS master command not timing out when RTU does not reply	
	Improvements to Modbus trace feature	7470
	Minimum Modbus master polling time reduced from 500ms to 50ms	7228
IECD/DNP3	Added support for DNP3 analog output command g41 v1, v2, v3 and v4	
	Allow non-contiguous point indexes for DNP3 slave	7275
	Changed DNP3 master integrity poll request for class 0 static data poll	7392
	Fix converting DNP3 double precision float types to IEC104 floats	7533
	Fix DNP3 slave to IEC104 master protocol conversion	7579
	Fix incorrect float translation for group 40 var 3 and 4	7536
	Fix issue with converting DNP3 counter to IEC104 Integrated Total	7531
	Fix issue with DNP3 master in processing multi-fragment responses	7409
	Fix to provide output control feedback for DNP3 slave to MODBUS master	
	Fix transmission of spontaneous update to IEC104 master on DNP3 static variation value change	7410
	Fixed issues in DNP3 slave processing Binary Output and Analog Output commands	7548
	Implemented common DNP3 trace functions for slave and master side	7557
	Implemented several new features for IEC104 to DNP3 double command conversion	7423
	Improve DNP3 slave processing of Binary and Analog Commands; now allow all combinations of OpCode and TCC fields: LATCH_ON, LATCH_OFF, CLOSE, TRIP	
	Increased size of DNP3 analog output block buffer to handle possible size of variation 4 – 64 bit double with single byte status	
IECD/MQTT	Fix data point map value update with Modbus master to MQTT conversion that generates events to MQTT subscribers	7465

	Increased supported character length for MQTT topic name, client id and client name	7173
IECD/VHMI	Fix issue related to DPS not starting for VHMI MQTT mode	7081
	Fix to report data point by VHMI only when value changes	
Mobile	Allow backslash '\' in username and password	7360
	Custom interface DNS now supported by Unitac modules	7192
	Ensure PDP context is deactivated before attempting to establish connection to avoid issue with connection attempt	7168
	Ensure SMS format is set correctly on the Quectel modules	
	Ensure that we don't try to restore IMS APN settings when using Sierra Wireless WP7702 module	7382
	Fix EID detection when APDU contains the tag and length	7522
	Fix initialisation of 3V/5V SIMs in SIM slot 2 on Merlin 4100/4400 series	7554 7625
	Fix LTE band selection for bands larger than 63 for Sierra Wireless modules	7680
	Fix mobile module detection on Merlin4100 series	7683
	Fix Quectel registration status poller	7484
	Fix Quectel RM520N restart after switching to QMI mode	7243
	Fix selection of bands above band 63 for SIMCom7600G-H	7356
	Fix SIM In status for Merlin series with non-Sierra Wireless modems	7220
	Fix SIM7070E connection to LTE on Merlin4400 series	7542
	Fix `va_mobile` failing to start if LTE band list is empty	7495
	Fixed network status constantly changing textual description (LTE/LTE-M) for used radio technology	7340
	Ignore SIM in/out events from eSIM that could lead to crash on Sierra Wireless modems	
	Improve behaviour on network down for QMI connections to ensure reconnection after network outage	6325
	LTE band locking configuration option `simX_lte_bands` now supports space separated bands	
	`sendsms` command now handles '+' at the beginning of international numbers	
	Support firmware auto select on Sierra Wireless WP7702	7349
	Unitac modules now use wwan0 interface rather than eth0	6899
Network	Add interface name and state for aliases to `network_status`	6716
	Fix dependant interfaces starting correctly on a network restart	7598
	Remove the minimum IPv6 fragment size check	7320 7324 7325 7326
OpenVPN	Allow `tun` or `tap` setting to create interfaces correctly.	7114
PoE	Fix missing event on powered device disconnect	7195
SCEP	Fix certificate expiration date calculation	7572
	SCEP ATQ time now synchronised with NTP	7083

Serial Broadcast Server	Fixed incorrect handling of TCP connection to Terminal Server	7231
SNMP	Fix UCI MIB ifName truncation	6981
	SNMP `engineID` now has fixed value that persists through reboot	7355 7358
Strongswan	General improvements to memory usage	
Syslog	Fix syslog to use local time instead of UTC	7240
System	Adds the ability to define a COMMENT environment variable when invoking any process for display by `ps` command	7020
	Fix firmware upgrade on Merlin series running Sierra Wireless WP7602 module	7012
	Panic log now contains timestamp on crash events	5608
TACACS	Fix IPv6 support	6620
Terminal Server	Start serial device in RS232 mode to ensure terminal server initialises correctly	7009
VA Event System	Fix buffer overflow crash and add new internal warning event upon event buffer overflow	7176 7163
VRRP	Allow multiple groups in `vrrp status` command	7246
Web	Fix reboot via web UI	7574
Web/ Interfaces	Ensure interface names are not automatically capitalized on the web UI	7678
	Remove PPTP protocol from available interface protocols	7354
Web/ Modbus	Fix display of IECD status page to show data points	7170
Web/ Multiwan	Support `multiwan.interface.state_transition_hook` configuration via the web UI	5433
Web/ OpenVPN	Implement dependency between `local` and `nobind` option to avoid OpenVPN failing to start when both enabled in config	6819
Web/ WeConnect	Added support for DCU VPN Concentrator configuration options	
Web/802.1x	802.1x web UI enhancements; add file upload for certs and keys; Only display bridge interfaces as available 802.1x supplicant interfaces	6528
Web/Dynamic DNS	Restart DDNS when settings are changed from web UI	6491
Web/Firewall	Fix add and edit of firewall zones and rules via web UI	7573
	Support firewall rule `chain` option `web: security->firewall->traffic rules` `cli: firewall.rule.chain`	6898
Web/IECD	Change MODBUS serial interface presentation to a selection of detected serial interface names	
	Changed IEC104 TI option to list value instead of range	
	Fix delete button on web UI for IECD	7181
	Fix incorrect display of values in DNP3 slave to DNP3 master mode	7571
	Fixed web UI error in setting value range for IEC104 link number	6911

	IEC61850 client web UI enhancements	6600
	Improvements for IECD command points	7015
		7019
	Improvements to MODBUS master configuration	
	Improvements to VHMI web configuration	7062
Web/IOSERV	Add support for upload of CID file	6897
Web/Mobile	Added display of LTE bands supported by SIMCom7070E	7565
	Fix `va_mobile` restart on save & apply via web UI	7494
	Simplify mobile configuration using tabs via web UI	7707
Web/Mobile Manager	Show supported LTE bands for enable/disable via Web. `web: services->mobile manager->lte`	
Web/Status	Only show hardware capable features	6966
	Only show multiwan status when enabled	6966
Web/System	Fix duplicate firewall package in configuration export	6904

Web/System	Support missing configuration options for SSH connection identity, verbose and VRF via web UI
	`web: security->ssh->Identity`
	`cli: dropbear.dropbear.Identity`
	`web: security->ssh->Verbose`
	`cli: dropbear.dropbear.verbose`
	`web: security->ssh->VRF`
	`cli: dropbear.dropbear.VRF`
		6703

Web/VHMI	Fix broken upload of DPS private key file	
WeConnect	Fix auto generated RIP configuration to ensure WeConnect correctly connects in a Ethernet bridge scenario and also reestablishes on disconnect.	7427 7539 7591
	Fix duplicate interface creation on connect	7547
	Fix support for WeConnect	6793
		7218
	HTTPS support for DCU VPN Concentrator auto enrolment	6961

11.325.03.43.014

Module	Short Description	Mantis
Mobile	Use Unitac-specific AT commands `AT!UBAND`, `AT!UTEMP` and `AT!UREBOOT` instead of GCT commands	
	Added a module reboot after executing a factory reset of the Unitac module	
	Ensure Unitac module comes back in ECM/VLAN mode after factory reset	
	Added an extra delay before issuing the AT command to switch the Unitac modules into ECM mode.	
Web/Realtime Graphs	Fix web UI real time graphs for QMI mobile connections `web: status->Realtime Graphs`	7029

11.425.03.43.009

Module	Short Description	Mantis
Activator	Set model URL parameter to uimodel rather than machtype in updates to Activator	6761
Certificates	Improve error reporting for common issues with HTTPS certificates	6987
CLI	Improve error message for `uci show xy` when `xy` does not exist	
Ethernet	Add `arp-scan` utility to DRS, ORK and SXL families for consistency with EDG family `cli: arp-scan -l`	5829
Firewall	Fix variable name clash in zone option presence test causing occasional restart issue	
	Simplify firewall forwarding within a bridge by avoiding calls to iptables	
Firmware	Prevent downgrade of router firmware to a version that is incompatible with the on board Sierra Wireless module	6878
IECD	Fixed issue with IEC104 clock synchronization on conversion from CP56TIME2A to time format where memory was not being cleared correctly	
	Improvements for Analog Input integer to float conversion for IEC104 to DNP3	
Mobile	Ensure ARP is not turned off for the Unitac Ethernet interface causes problems with the firmware upgrade tool.	
	Ensure NOARP flag is set on mobile Ethernet devices to avoid the ARP table from filling up with entries from the mobile connection	6676
	Ensure the SMS format is set correctly and interfaces restarted after Verizon provisioning.	
	Fix to ensure the Verizon attach APN is set correctly	
	Only restart interfaces when Network Initialisation was indicated in OMADM	
	Record Unitac AUX antenna values regardless of MIMO state	
	Switch to AT!GSTATUS to retrieve signal information for Unitac modules	
OpenVPN	Fix privileges in OpenVPN to allow automatic restarts and fix open SSL errors in WeConnect	6793
SNMP	Correct vaUciMib implementation so that it matches the previous implementation	6903
SNMP/GPS	Fix GPS heading in MIB from degrees to micro degrees	6901
System	Fix issues when config files have execute permissions set and configuration audit is enabled	
TPM	Don't allow loading a new key if a key with the same label is already present	
VLAN	Fix VLAN bridging on Merlin and GW6650V models	6768 6844
Web	Fix error message typo when SSL subsystem fails to initialise	
	Print openSSL errors when init, cert load or key load fail	

Web/Interfaces	Avoid restarting all interfaces when adding new interface via web UI	6922 6923
Web/Cwatch	Fix display of bridge interface on Cwatch interface list	6824

Web/Event System	Support configuration of Event System Digital Input change event input number and value via web UI
	
	`web: services->va event system->event filters->Input Number`
	`cli: va_eventd.forwarding.input_number`
	`web: services->va event system->event filters->Input Value`
	`cli: va_eventd.forwarding.value`
		6839

Web/IECD	Added selector lists in place of fixed values where possible	

Web/OSPF	Support configuration of OSPF VRF via web UI
	
	`web: network->ospf->global settings->VRF`
	`cli: ospfd.routing.vrf`
		6964

Web/PoE	Modifications to a PoE port configuration via the web UI no longer result in the other PoE ports being reset	6827
Web/System	Restore javascript validation preventing underscores in system hostname	4555

11.525.03.43.000

Module	Short Description	Mantis
BGP	Fix local VRF IP subnet not being advertised over WAN VRF using a BGP instance in the same VRF	6799
Cwatch	Fix cwatch using cached interface values rather than current values which caused cwatch to intermittently miss state changes	6784
IECD	Fix IEC104 operation when IEC104 local TCP port configured to '0'	6778
	Fix unwanted Health Point updates during normal master switchover for IEC104 RTU's	6463
	Fixed Modbus master initialisation error when loading TCP routes	6803
	IEC61850 Server: Add conversion from Modbus DI to DPS objects	
	IEC61850 Server: Added mapping of Modbus DI to integer types (INS, etc)	
	IEC61850 Server: Fix error with double init of data points for Modbus master	
	IEC61850 Server: Update points from Modbus RTU when point have not been changed before in addition to when value changed	
	Improve debugging of IEC61850 client when processing control commands	
Mobile	Fix signal strength detection on older Unitac modules	6805
	Rename 'phone number' to 'MSISDN' in mobile stats	
SNMP	Fix SNMP configuration using TCP protocol	5930
VRF	Fix DNAT behaviour for alias interface within VRF	6705
Web	Fix slow web SSL access when using keys from TPM	6734
Web/ IPsec	Fix error on saving of configuration general section	6281

Web/ Network	Show colour codes for interface status in network overview	6536
Web/ OpenVPN	Automatically add and remove OpenVPN network interfaces	6296
Web/Firewall	Fix summary page showing rules with `option enabled '1'` in configuration file as disabled	6765

Web/HTTP
Server
	Support configuration certificate keys in TPM
	`web: services->http server->Certificate Key Format`
	`cli: uhttpd.uhttpd.keytype [PEM|TPM]`
		6756

Web/Mobile	Correct display of mobile interface type on web UI interface overview page	6787
Web/SCADA	Moved COSEM HDLC Bridge configuration from Services to SCADA tab	6781

Web/Status	Add download button for kernel and system log
	`web: status->System Log`
	`web: status->Kernel Log`
		6794

11.625.02.23.000

Module	Short Description	Mantis
Activator	Fix Activator active update command returning incorrectly parsed IPv6 addresses	4727
CWATCH	Cwatch now ignores non-existing UCI network interfaces	6644
Failsafe	Failsafe mode now uses SSH instead of telnet access	6663
Firewall	Insert the `MARK` configuration rule before the `redirect` rules in the firewall table	5405
IECD	Added RTS-CTS flow control of the serial (when not using tservd)	6615
	Fix issue in IEC104S to IEC101 in transparent mode, where 104 ASDU CA=65535	
	Fix issue processing IEC101 reset process response	
	Fix issue with DNP3 Gr3 (double bit) to IEC104 single point conversion	6671
	Fixed incorrect cleanup while closing during IEC104S TLS session establishment	6636
	Fixed issues with events not sent from IEC104 slave offline queue after connection is restored	6648
	Fixed issues with processing TI 105 Reset Process command	6640
	IEC104 slave: Fixed incorrect application of clock synchronization command	
	IEC104 to IEC101 conversion: fixed issue with converting QU field of commands from Master (104) to RTU (101)	
	IEC104 to IEC104 conversion: Fix Double command Execute part of Select Execute sequence not passing on QU field of command	6656
Mobile	Add MTU detection for Unitac modules	
	Ensure MTU does not exceed 1500 bytes on QMI links	6567
	Ensure Quectel EC25/EG25 modules use GSM format for SMS messages	

	Fix crash when `switch_sim` command is executed with no value	
	Fix interface name and type for Unitac modules on Merlin series	
	Fix interface name and type for Unitac modules on Merlin series	
	Fix missing LTE band information on older Unitac firmware	6630
	Fix performance issues on Sierra Wireless modules (introduced in 25.02.80.000)	6708
	Prevent `+CGEV: NW DETACH` trigger warnings in the logs	6616
	Prevent crash when handling SIMs with invalid ICCID	6635
	Prevent crash when no SIM slot specified for SIM switch command	
	va-mobile no longer automatically changes GNSS configuration as this is now done in manufacturing	6659
Monitor	Fix Monitor Keepalive configuration changes taking effect immediately when changed from web UI or Activator	6650
NTP	Improvements to chrony operation for interface state changes	6631
PPP	Fix connection issue when two ppp links have similar UCI name	6654
Roaming Manager	Retry existing connection after routine disconnect when using Roaming Manager feature	
Routing	Enable FRR `vty_enabled` option in user interface	6613
SFP	Support `ethtool -m` option for displaying SFP info	
SNMP	Fix mibwalk error on .1.3.6.1.4.1.2078.3.1.2.4.2 when walking VA-MODEM-MIB::roamingOp* series of values	6618
SSH	Fix SSH login via private and public key.	6425
TACACS	Fix ipv6 address support	6620
Web	Sort web UI drop down headings	5909
Web/ Multiwan	Allow multiwan configuration via web UI when no multiwan config options exist in configuration file	
Web/BGP	Fix BGP network option for IP address/subnet input rather than interface name web: network->bgp->global settings->Network	6619
	Fix BGP network option for IP address/subnet input rather than interface name web: network->bgp->global settings->Network	6619

Web/HTTP Client	Support configuration of Http Client certificate key format
	`web: services->http client->advanced->Certificate Key Format`
	`cli: httpclient->httpclient->KeyFormat`
		5792

Web/IECD	Changed default location of TLS certs to `/etc/cert`	6643
	Only show `IEC104 TLS Common Name` and `IEC104 TLS Verify Depth` options when `IEC104 TLS Validate Peer Cert` is enabled	6643
	Removed unused `iec101_cmd_type_id` option from web UI	6627
	Support SCL import file upload for IEC61850 master `web: scada->iecd->master protocols->configure IEC61850->Select IEC61850M SCL File for Upload`	
	Support upload capability for TLS cert, key and CRL files via web UI	6643
Web/IPsec	Web UI IPSEC configuration improvements	6281
Web/System	Fix firmware flashing error mesage	6286

Web/VRRP	Add support for configuration of VRRP Group Multicast Source IP	4057
	`web: network->vrrp->vrrp group configuration-> Multicast Source IP` `cli: vrrp.vrrp_group.mcast_src_ip`	

11.725.02.99.000

Module	Short Description	Mantis
CWATCH	Ensure cwatch can handle comma separated ping destinations	
GRE	Fix GRE keepalives	6554
IECD	Added conversion from 4 Modbus 16-bit registers (int64) to iec104 float	
	Added support for conversion of 2 modbus 16-bit registers storing FLOAT32 to IEC104 type 13 float	
	Fetch CRL file using a link from peer certificate	5955
	Fix CSV import issue when parsing bitmap options	6555
	Fix issue in IEC61850 master to DNP3 slave conversion of analog float values	6593
	Fix serial configuration in modbus master	6540
	Fix tx buffer overflow and iecd crash when DNP3 Slave serving large number of points and events (500+)	6609
	Handle multiple sessions, cleaning up in case of errors when fetching CRL file using a link from peer certificate	5955
	Improved IEC61850 control command processing in relation to IEC101 and IEC104 single-double select-execute sequence	
	Improved IEC61850 SCL import and export into UCI file	6581
	Improved show statistics command when multiple RTU protocols are used per point	6580
	Improvements in the VRTU to IEC61850 slave conversion	
	MQTT Slave to MODBUS RTU: send MQTT publish only on value change	6376
	Support configurable IED name and LD name for IEC61850 slave	

	`web: scada->iecd->slave protocols->configure iec61850->IEC61850 IED Name`
	`cli: iecd.port.iec61850_ied_name`
	`web: scada->iecd->slave protocols->configure iec61850->IEC61850 LD Name`
	`cli: iecd.port.iec61850_ld_name`	

	Support for Digital Input inversion in the IEC61850 server	
Mobile	Add data-only configuration for Quectel EP06 module	
	Add display of additional Unitac signal values to `vam` command and web UI	
	Disable the APNs when connection is terminated for Unitac modules	6484
	Fix for SMS received by Quectel EG25G via IMS in Verizon network	6594
	Mobile connection no longer dropped when 2nd antenna is disconnected when using Unitac modules	6446

	Support new option to enable MIMO on Unitac modules (disabled by default).
	
	`web: services->mobile manager->advanced->Enable MIMO for Unitac radio Modules`
	
	`cli: mobile.mobile.unitac_mimo_enabled`
		6499

Network	Fix dependent interface behaviour when parent WAN interface is using QMI mobile interface	6493
QoS	Fix QoS initialisation	6560
SCEP	Fix intermittent issue where only one SCEP request was sent when multiple SCEP clients were configured	6523
	Fix loading of SCEP CA certificate	6525
Strongswan	Do not split long PSK into separate lines which would cause PSK to be read incorrectly and Phase1 failure	6537
Syslog	Fix multiwan errors in log when multiwan not configured	6489
System	Prevent download of incorrect firmware family	
TACACS	Fix tab correction for TACACs+ user login via SSH	6527
Terminal Server	Fix failure to recover from bind failure while interface down	6464
TPM	Fix RSA key loading on big endian platforms	
	Improve support for TPM access from multiple processes to avoid TPM being locked by another process	6483
User Limits	Fix Procrustes user limit events	6538
Web	Fix web UI intermittently advising router is running in factconf when in config1	6547
Web/ Interfaces	Fix default gateway handling for DHCP protocol	6601
Web/IECD	Fix typo in DNP3 slave protocol option	6578
	Fix web UI issue in IEC61850 slave	
Web/Mobile	Prevent option `ifname` configuration being added to mobile interfaces when configured via web UI	6501
Web/SNMP	Improvements to web UI SNMP configuration	
WiFi	Fix `ifup` transmission issue when WiFi is bridged with an Ethernet interface	6514

11.825.02.80.000

Module	Short Description	Mantis
Ethernet	`ifup` now preserves VLAN interfaces when configuration has non VLAN and multiple VLANs attached to the same Ethernet interface	6247
	Increase frame size limit to accommodate large VLAN packets	6307
Event System	Fix boot success event	5927
GPIO	Merlin4600 digital inputs now default to dry	5992

IECD	Added missing implementation of T0, T1 and T3 timers to address IEC104M link not closing on `ifdown`
	
	`web: scada->iecd->master protocols->configure iec104->iec104-X`
	`cli: iecd.port.iec104m_t0 (def: 5 secs)`
	`cli: iecd.port.iec104m_t1 (def: 15 secs)`
	`cli: iecd.port.iec104m_t3 (def: 20 secs)`	

	Fix parsing parsing of `-casdu` switch in IEC104 firewall	6298
	Fixed incorrect parsing of MQTT `SUB-ACK` packet	6295
	Fixed load errors for custom SCADA firewall rules	6025
	Fixed MQTT hostname resolution	6308
Mobile	Add switch to add switch to data-centric mode for Quectel EC25 and SIMCOM modules	
	Added PCI display for Unitac modules	6251
	Ensure that Verizon APN is correct for default/initial bearer	6154
	Enter airplane mode before attempting to change the default LTE bearer to avoid issues with SIM failover	5991
	fix `chat` command failing if previous `chat` aborted	6210
	Fix crash when LTE band retrieval for SIMCOM fails	
	Fix ESN display where leading zeros were being omitted	6345
	Fix incorrect reporting of RSSI when using Unitac mobile module	6437
	Fix multiwan to run with default group when no group name specified	
	Fix to prevent the modification of the Verizon attach bearer	6043
	Fix va_roaming ignoring `Stat=0` operators in roaming scan	6184
	Ignore network provided DNS addresses if option DNS configured	6372
	Improvements to operator scan: • Now commence an operator scan as follows; `AT+COPS=2` (detach from network); `AT+COPS=0;+COPS=?` (reattach and commence scan, all in one operation) • `AT+COPS=?` timeout increased to 190 seconds • automatically retry a failed `AT+COPS=?` command if it fails within 15 seconds • `vam roaming` now includes scan duration in seconds	
	Incorrect SINR reported for Quectel modules	5951
	Re-connect to network automatically if `AT+CGATT=1` fails	
	VA Mobile roaming diagnostic now shows roaming info for all modems by default `cli: vam roaming`	
Network	Ensure `ifdown` kills all `ifup` processes on the same interface and not just the child processes	
	Fix repeated `ifup` race condition on bridged interfaces	6265

RTUD	Added support for inverting digital inputs after reading from hardware
	
	`web: scada->rtud->advanced->Invert Inputs`
	`cli: rtud.main.invert_inputs (def: 0)`
		6208

SCEP	Added certificate expiry check during re-enrolment	6235

	Change new cert and key permissions when they are installed at the end of the SCEP process. Also adjust the CRLs directory to allow strongswan write access for runtime CRL downloads.	5908
	Strongswan is now restarted after SCEP renewal to ensure the peer correctly deletes the existing IKE_SA	6190
SFP	Merlin4600 now supports both 100M and 1000Mbps using SIGMII mode	
SNMP	Fix creation of SNMPv3 traps	5943
	Fix failing snmpwalk on vaModem MIB when no roaming info available	5922
Strongswan	Allow IPSec tunnels to start when CA certificate download fails and blocking is disabled in `scep_cert` config	6324
	Remove FlexVPN GRE IP addresses on tunnel termination	5924
	Fix IKE SA delete being sent with correct message id to ensure IPSec peer does not discard	6246
System	Changed password hash algorithm option value to a ListValue `cli: list system.main.passwrd_hash_algo`	5001
	Fix auditing of DMVPN configuration using option `audit_cfg`	
	Fix boot-success script to set altimage to current image to avoid Merlin4400/4600 series incorrectly reverting to altimage	6392
Terminal Server	Increase port limit to 16	6267
	Added support for new option in GW2124P to control serial LED detection using DSR control signal when DTR/DSR signals are being used `cli: tservd.port.led_dsr_detect (def: 0)`	
	Auto detect serial mode gpio control settings	5970
	Fix SNMP poll of TSERV-MIB	6477
	Fixed issue with auto detection of serial port names on GW2028	6313
Web	Improvements to web UI performance and load times	6178
Web/ Ethernet	Fix Ethernet adapter interfaces presented in web UI for Merlin4600 series	5986
	Remove Ethernet Port map section in web UI for Merlin4400/4600 series. Mapping configured in Etherent interface view.	5986
Web/ Interface	Added `mtu` configuration opton for PPPoEoA and PPPoA ADSL interfaces	5702
Web/ OpenVPN	Do not add `key_direction` option when set to its default value (bidirectional) when OpenVPN configured via web UI	6063
Web/GPIO	Change Web UI digital input mode default to dry mode	6060
Web/IECD	Changed free text fields `log_vaevent_on_change`, `vhmi_on` and `vhmi_dword` to selector on-off	6165

Web/Terminal Server	Added support for TCP Tap Port configuration
	`web: scada->terminal server->port->advanced->TCP Tap Port`
	`cli: tservd.port.tap_port (def: 0)`
		6291

Web/VA Event	Add length check in web UI for `snmp_auth_pass` and `snmp_priv_pass`	
Web/WiFi	Add WPA Enterprise configuration to web	5963

11.9 25.02.14.032

Module	Short Description	Mantis
Download	Fix interrupted download when va_vars incorrectly states image not found. Download now correctly continues rather than starting again.	6354
Mobile	Fix duplicated ICCID when using WP76xx-AU module on Merlin4600 series.	6352
TACACS	Fix TACACS behaviour when router is configured to only authorise authentication for SSH access (or other configured PAM services). Previously all authentication requests were sent to TACACS server instead of SSH only.	6050
TPM	Fix HTTPS incoming connection activation with key stored in TPM on Merlin4600 series.	6367
	Flush transient objects from TPM RAM upon session open on Merlin4600 series.	

11.10   25.02.14.027

Module	Short Description	Mantis
BFD	BFD rate changes now working as expected when multihop enabled	6255
	Fix BFD multiplier configuration	6242
Download	Fix size calculation when image download exceeds 10M	6033
	Increase time limit for image download to 5 hours (previously 2 hours)	6266
HTTP Client	Set download minimum rate limit to 1kBps	6266
PPPoE	`ifup <ifname>` now correctly re-establishes when `<ifname>` is a PPPoE link and is already up	6241
Terminal Server	Fix incorrect translation of `option serialPortName`	
	Fix TOS value support using `option tos_value`	

11.11   25.02.14.016

Module	Short Description	Mantis

GPIO	Merlin4600 series digital input values changed to match GW2020 series for SCADA operation compatibility
	
	`0 = input not detected/open/low`
	`1 = input detected/closed/high`
		6197

11.12   25.02.14.013

Module	Short Description	Mantis
Ethernet	Fix default MAC address for Merlin4600 Ethernet ports	5740
GPIO	Merlin series digital inputs now default to dry	5992
IECD	Fix data point handling where previously only the last data point was forwarded the SCADA master when using HART protocol	6046

	Fix IECD CSV files data point import.	5975
	Fix issue in handling periodic GI and Clock Sync timeouts in IEC101 Master	
	Support for CP24 timestamp format messages in IEC101 to 104 conversion	5980
Mobile	Fix crash when LTE band retrieval for SIMCom fails	
SFP	Fix interface failing to restart after network package restart	6079
Strongswan	Decrease OCSP/CRL fetch timeout to 3 seconds from 10 seconds to avoid resource issues for multiple tunnels using CRL	5954
	Exclude password field from re-enrollment requests	5993
	Handle DER or PEM format for SECP fingerprint	5879
	In case multiple root CA's downloaded, verify fingerprint of the root	
	Send DELETE message from IKEv2 delete task for initiator. Previously when initiator, the router terminated the IKE_SA without sending a delete which led to problems when connected against another VA router in responder role.	6052
System	Backup, check and fix uboot environment in case of corruption on models using Sierra Wireless WP7600 series processor (GW1150, Merlin4600). Fixes rare situation where machtype could revert to incorrect model.	6031
Terminal Server	Fix loopback test for serial ports	5972

Web/IPsec	Support configuration for FlexVPN via web UI
	`web: services->ipsec->connection->Route Interface`
	`cli: strongswan.connection.route_interface`
	`web: services->ipsec->connection->FlexVPN Prefixes`
	`cli: strongswan.connection.flexvpn_prefixes`
		6000

	Support configuration of local cert via web UI
	`web: services->ipsec->scep certificate->Local Certificate`
	`cli: strongswan.connection.localcert`
		6000

Web/RTUD	Fix defaults for Web UI fields to allow web config to save the page	6075

	RTUD auto generate config option now defaults to off in both web UI and router
	`web: scada->rtud->main settings->Auto generate configuration`
	`cli: rtud.rtud.point_auto_config_on`
		6075

Web/SCEP	Support configuration of SCEP fingerprint and CA Name via wb UI
	`web: services->ipsec->scep certificate->CA Fingerprint`
	`cli: strongswan.scep_cert->fingerprint`
	`web: services->ipsec->scep certificate->CA Name`
	`cli: strongswan.scep_cert->ca_name`
		6001

Web/Terminal Server	Support configuration of serial port name via the web UI
	`web: scada->terminal server`
	`cli: tservd.port.serialPortName`
		5424

11.13 25.02.14.002

Module	Short Description	Mantis
IECD	Fix IEC MIB walk	5920
IOSRVD	Fix for option auto_detect behaviour to not remove undetected devices from iosrvd config file	5522
Mobile	Fix ICCID collection for second SIM on Sierra Wireless and Quectel EM06 modules. Previously showing same ICCID for both SIMs	5946
Network	Fix static default route configuration using target 'default' and netmask 0.0.0.0	5942