R3xx Firmware Revision History

In order to find out the revision of your module's firmware use the "ATI<cr>" command.

If you are an existing customer and want to update your firmware please contact zigbeesupport@telegesis.com

R301 – 16-09-2008

Changes

- Upgraded from EmberZNet3.1 to EmberZNet3.2
- Fixed Problem with specifying EPID in S03 on joining Node
- Removed functionality 0018 temporarily for memory savings
- Fixed cloning to End Devices from Nodes other than the Parent
- Improved cloning mechanism. AT+CLONE can also address NodeIDs and Address table indexes (when cloning to devices >R300).
- It is now possible to write to address table entry 05 (sink entry)
- Data sent to endpoint 0 and 2 is now displayed transparently (if enabled)
- Added bit 2 of S0F to enable displaying all sink advertisements (disabled by default). New Prompt: ADSK:<EUI64>,<NodeID>
- Added bit 7 of S10 to stop node from replacing existing sink with better one (lower cost)
- Added volatile S46 for data related to start-up functionality.
- Contents of S46 (16 bit number) is attached to tracking messages (functionality 0112 and 0113)
- Fixed ATSALL triggering replies
- Added bit A of S0A to disable joining nodes to ask for the Trust Centre link key.
- Improved Trust Centre EUI64 caching
- Fixed Source Route handling
- AT+FNDSR is now working at ZDO Level (works with 3rd party nodes), but only when addressed with EUI64 or address table index.
- Debouncing now operates on all 4 IRQ inputs when enabled and works in sleep modes
- Fixed sending SCASTBs with a payload smaller than 5 bytes
- ETRX3: Fixed GPIO misconfiguration when enabling PWM output on PB7

Registers and Commands affected	Indirectly affected
- S03 - functionality 0018 - AT+CLONE - S0F - ATSALL - S0A - AT+FNDSR	Nothing

Upgrade information available	Upgrade Note Details
None	For the new cloning mechanism the user needs to ensure that the target device is just a single hop away before initiating the cloning process. If this is not the case the remote node will remain in the bootloader until reset or recovered using AT+RECOVER.

R302 – 30-04-2009

Changes
- Upgraded to EmberZNet3.3.3
- Fixed AT+N providing odd results if node is not part of a network
- Fixed functionalities 0012 to 0014 to cause routers to re-join non existing networks three twice.
- Added functionality 0018
- Setting bit 9 of S0A on the ZC before starting the network will start the network without the use of a central Trust Centre (distributed Trust Centre mode, not ZigBee compliant). Note: Only a global link key can be used, so Setting bit 7 of S0A will be ignored in this mode)
- Added command AT+BECOMETC to allow the ZC in a network which has been started with a distributed TC to become the TC.
- Setting Bit D of S10 changes the sinks and Trust Centre to be of type EMBER_HIGH_RAM_CONCENTRATOR. This will cause remote nodes not to send a source record message only before the first message sent to the sink or Trust Centre and not repeatedly.
- Sinks also send a many-to-one route request via functionality 02xx and create aggregation routes
- AT+PING and replies to AT+SN use ZDO device announce messages for improved ZigBee compatibility
- ADSK prompt is only shown for sink advertisements of sinks, which aren't the local node's sink
- Shortened S0B to 16 characters.
- Fixed functionalities 0108 and 0109 to only send a maximum of 47 characters
- Fixed deep sleep IRQ handling
- Added S47 to represent the Node's Power Descriptor
- Added S48-S4B to configure the Node's second endpoint
- Added new ZDO commands for Device and Service Discovery: AT+IDREQ, AT+EUIREQ, AT+NODEDESC, AT+POWERDESC, AT+ACTEPDESC, AT+SIMPLEDESC, AT+MATCHREQ
- Improved Cloning Mechanism
- Re-Introduced the AT+DMODE command (known as AT+OPCHAN in R2xx) to create a serial link between any two devices
- Added possibility to join as non sleepy end device (RX on when idle) by modifying the meaning of bits E and F in S0A. New Device type is called ZED.
- Changed formatting of the AT+NTABLE command
- Improved Network Formation and Joining
- Changed S-Registers to not do a Network Key update automatically from the COO and added command AT+KEYUPD to do this manually.
- Source Routes get deleted in case of unsuccessful delivery of a unicast, unless bit D of S10 is set
- Added S4D, S4E and S4F for expert stack timing adjustments
- Improved remote S-Register access to allow concurrent accesses.
- Inverted functionality for bit 8 of S10 to prevent frequent broadcasts to search for sink
- Added Data mode (in R2xx know as "channel")
- Changed S28 to trigger on Network Join
- AT+PING renamed to AT+ANNCE for clarity (AT+PING is still supported for backward compatibility)
- Changed format for response to AT+NTABLE to be inline with other ZDO prompts
- End Devices, which have lost their parent will report "LostPAN" instead of "LeftPAN" as they are still part of the PAN and simply can't talk to it any more. AT+N will still show the network parameters. Use AT+REJOIN or simply poll to find new parent or AT+DASSL to leave.
- In case a parent knows a sink it will pas it on to any joining end device. In case the parent's sink gets updated the parent will update all children using a broadcast.
- Added functionality 0400 (known as 0200 in R2xx).
- Improved AT+FNDSR
- Replies to ATREMS have been re-formatted for better usability

Registers and Commands affected	Indirectly affected
- AT+PING - AT+SN - AT+CLONE - S0A - AT+NTABLE - ATREMS - S28	Nothing

Upgrade information available	Upgrade Note Details
none	- "FFD" and "COO" prompt have been combined into "FFD" - Formatting of ATREMS has changed - After upgrading a factory reset will be conducted - Cloning between R301 and R302 won't work - By default nodes don't search sink automatically if none is known to prevent frequent broadcasts (bit8 of S10)

R303 – 07-04-2010

Changes

- Upgraded to EmberZNet3.5.1 (ETRX2)
- Upgraded to Ember ZNet4.0.2 (ETRX3)
- Fixed wakeup by UART to interfere with other external interrupt's functionality
- Fixed NodeID MSB and LSB mix-up in reply to AT+SN and AT+ANNCE and S07
- Fixed MCASTs not getting through to both endpoints
- ADC calibration now only performed when needed. Significantly shortens awake interval for sending messages containing ADC readings.
- Added interaction with ETRX3 series 32 bit S-Registers
- Modified "RX:" prompt to include sender's EUI64 and Node ID:
  RX:[<EUI64>],<NodeID>,<profileID>,<destinationEndpoint>, <SourceEndpoint>,<clusterID>: <payload>
- Added functionality 0401 to use separate IO for indication
- Non-sleepy EDs are polling as well when functionality 0010. This is just to prevent them from timing out at their parent
- ETRX2: Fixed Data Mode malfunctioning when command echo is switched off
- Corrected default value of S4E to 0605 (5 Minutes)
- ETRX3: Corrected major bug with I/O configuration when going into power modes 2 and 3
- ETRX3: Fixed S0D to also show the firmware revision
- Fixed Functionalities 24xx to 26xx
- ETRX3: Fixed Charging External RC for functionalities 0111 and 0113
- ETRX3: Fixed functionalities 0400 and 0401
- ETRX3: Fixed IRQs triggering on both edges in power modes 2 and 3
- ETRX3: Fixed potential issue with timers stopping when waking up form sleep
- Added AT+RTABLE (ZDO) command
- S4B and S4C extended to hold up to 12 cluster IDs
- S46 is now a 32-bit number
- ETRX3: Fixed RDATAB Messages
- ETRX3: Setting bit 8 of S15 enables Vref output on PB0
- Added functionality 0114 and 0115 to send tracking message, which doesn't contain ADC readings.
- Fixed mixing up MSB and LSB of a Device Announce
- Changed default power setting to 3dBm for both hardware platforms. Power settings above 3dBm will automatically enable the boost mode.
- Improved timer accuracy when repeatedly woken up by external interrupts from power mode 2.

Registers and Commands affected	Indirectly affected
- S07 - AT+RTABLE - S4B, S4C - S46 - S15 - S01	The 16-bit short address of a node reported using AT+ANNCE (AT+PING) or as a reply to AT+SN will be shown with the least significant byte first in case the remote node using a previous version of this firmware.
Upgrade information available	**Upgrade Note Details**
None	After upgrading a factory reset will be conducted

R304 – 17/09/2010

Changes

- Upgraded to EmberZNet4.2.0 (ETRX2 and ETRX3 series)
- First Release for the ETRX351 family
- Prompt for receiving data on custom endpoint modified to include the length of the incoming message: RX:<profileID>,<destinationEndpoint>, <SourceEndpoint>,<clusterID>,<payload length>:<payload>
- Hardened Response to AT+N
- Fixed Parameter entry for AT+SN
- Hardened UART buffer handling
- Added AT+PASSTHROUGH command for passthrough bootloading on the ETRX3 series
- Added the "ENTERING BLOAD" prompt to be displayed when a device is brought into the bootloader remotely (using AT+CLONE on the ETRX2 series or AT+PASSTHROUGH) on the ETRX3 series
- Modified AT+RECOVER command on the ETRX3 series to recover from failed passthrough bootloads
- ETRX3: Fixed S19 not being copied into S18 after reset
- Fixed RF power changing back to normal after reset when bit 3 of S10 was set during a change of S01
- ETRX3: Fixed S3F not having any effect
- It is now possible to completely erase S4B and S4C by entering "ATS4B=" or "ATS4C=" respectively
- Added AT+SJN for "silent joining"
- Fixed watchdog timer triggering when node is due to go to sleep, but flow control is preventing it from sending pending information to host
- Optimized throughput of the channel
- Implemented network manager functionality. By default the COO is the network manager.
- Added AT+BECOMENM command for node other than the COO to become network manager
- Added AT+CCHANGE command for the network manager to change the network's channel
- Added "NM:ES REPORT WARNING" callback to indicate high number of unicast failures in the network reported to network manager
- Added Bit 6 of S0F to hide Network Manager Warning
- Added functions 0130 and 0131 to send ADC data and counter register S46

Registers and Commands affected	Indirectly affected
- AT+SJN - AT+PASSTHROUGH - AT+BECOMENM - AT+CCHANGE - AT+SN - S0F, S18, S3F - Function 0130	- If flow control prevents the node from sending its data before going to sleep for more than 10ms the node will go to sleep without sending its data

Upgrade information available	Upgrade Note Details
None	- Passthrough bootloading on the ETRX3 series will only work if the receiving node has a recent OTA capable bootloader (v42 or later) - The ETRX351 family of the firmware is now denoted by "351", e.g. "ETRX351_R304C.ebl". The ETRX351 and ETRX357 firmwares are not interchangeable - When R304C is loaded on to an ETRX357-LRS, it is necessary to activate the RF power amplifier with the comands "ATS178=1" and "ATS198=1" followed by a reset

R305 – 03/03/2011

Changes

- Upgraded to EmberZNet4.3.0 (ETRX2 and ETRX3 series). This should lead to a significant power savings on sleepy end devices
- First Release for new "-LRS" variants
- ETRX3: Increased UART TX queue size to 256 bytes
- Added support for processor idling to save additional power in power modes >=1
- Fixed functionality 0130 repeating the 16 least significant bits of S46
- (non sleepy) End Devices will receive sink advertisements directly and not via their parents
- Improved sink address handling on Sleepy and Mobile End Devices
- Sleepy and Mobile end devices get told the address of their parent's sink automatically after joining
- When receiving a tracking messages triggered by functions 0112-0115 a sink will also prompt a "TRACK" or "TRACK2" message locally to report its own RSSI reading
- Fixed ZDO requests to the COO crashing the COO (eg when reading its neighbour table)
- ETRX3: Fixed AT+EN failing when a specific network is specified in S00 and S02 which already exists. AT+EN will now form a network with a random PAN ID instead as specified in the AT command dictionary
- Moved triggering S27 "Functionality at Bootup" to after the stack is initialized.
- ETRX3: Fixed Functionality 005x and 006x
- The default power level out of the EM35x for the ETRX35x-LRS and ETRX35xHR-LRS has been set to -11dBm to comply with European regulations. The highest allowable power setting has been restricted to -7 which results in 20dBm output power.
- The default channel mask for the ETRX35x-LRS and ETRX35xHR-LRS has been set to 0x7FFF to disable channel 26, which only allows limited power output in some countries
- Improved DMODE in that data is send faster when at the same time there is incoming data
- Added bit 8 of S0F to show messages received on endpoints 3 and higher
- Added bit 7 of S0F to hide AddrResp prompts
- ETRX2: enabled pull-ups and pull-downs on TXD and RXD
- Improved hardware handshaking to prevent buffer overflow causing a reset
- ETRX2: Force a token Reset when first installing R305, so downgrading to versions prior to R304 (ZNet3 causes a token Reset and eliminates problems with the different token systems of ZNet3 and ZNet4)
- Eliminated requirement to wait for ">" sign when sending xCASTBs
- ETRX3: Fixed S40 mixing up source and destination endpoints during read access
- ETRX2: Fixed AT+SJN

Registers and Commands affected	Indirectly affected
S0F S13, S14 S27 S40	

Upgrade information available	Upgrade Note Details
None	- ETRX2: After upgrading a factory reset will be conducted - AT+SJN will always assume a NetworkKeySequenceNumber of 0

R306 – 21/10/2011

Changes

- Upgraded ETRX3 series to EmberZNet4.5.3.1
- Upgraded ETRX2 series to EmberZNet4.3.5
- ETRX3 series: Increased maximum number of children per router to 64
- Fixed AT+DASSR to not sometimes disassociate child nodes of the remote node as well as the remote node itself
- Fixed function 0113 not returning output pin to high-Z
- Fixed problem of ETRX2-PA sending Error 0F with certain power settings
- When an invalid baudrate is set in S12 the node will default to a baudrate of 19200
- Clarifications in the AT Command Manual
- ETRX2: Fixed stack bootup issues with bit 3 of S10 set and S01 modified whilst the node is part of a network
- ETRX2: Improved accuracy of the 250ms time-base in power mode 0
- ETRX2: Fixed input pull-ups and pull-downs not working
- Fixed DMODE link not closing when one device is reset
- "Length" returned by AT+NTABLE and AT+RTABLE is more reliable
- AT+CCHANGE now also takes into account the channel mask defined in S00
- ATREMS can read local node (use FF as the address)
- Added bit D of S0A so that a router can be prevented from actually routing messages
- Added bit C of S0A to add a prescaler of 2^8 (256) to the PWM
- Added bit E of S0F to show RSSI of incoming messages
- Added bit F of S0F to add wrapper to local S-register reads
- ETRX3 series: Fixed bit A of S0A having no effect
- Fixed searching a sink for only a single hop
- Non-sleepy end devices now obtain their sink from parent
- Improved sink address acquisition for Sleepy End Devices
- Fixed <stx><etx> being disabled when xCAST wrapper is off (S0E bit 5)
- Fixed potential hang-up when SED has lost its parent
- ETRX357 – fixed changes to S16 stopping the PWM
- ETRX357 – fixed PWM not running after a reset even though S11 bit F is set
- Added function 001E to detect a missing coordinator
- Added functionality 0x0116 to 0x0119 to filter tracking messages by RSSI
- Added functionality 0x0020 and 0x0021 to switch PWM when network is lost
- Factory Reset Tool now works even if the serial port is disabled in S15

Registers and Commands affected	Indirectly affected
- AT+DASSR - AT+NTABLE - AT+RTABLE - AT+DMODE - ATREMS - S12, S13, S14 - S0A - S0F - Functions 0020, 0021 - Function 001E - Functions 0116-0119 - Function 0113	

Upgrade information available	Upgrade Note Details
None	- After upgrading a factory reset will be conducted

R307 – 14/5/2012

Changes

- Upgraded to EmberZNet4.6.4 (ETRX2 and ETRX3 series).
- First Release for new "-ERS" variants of the ETRX3 series
- Fixed Power mode 1 not being entered after Reset when preset in S3A
- ETRX3: PA7 can be configured as UART TX_ACTIVE in S15
- ETRX3: Bit 23 of S15 can be used to switch PC6 to nTX_Active
- Added functionality 001F
- ETRX3: Maximum level for S01 limited to -7 on LRS devices.
- Modified power management to support the new Znet4.6.x features.
- ETRX3: Added new commands for Binding management using the ZDO
- ETRX3: Added Binding table
- ETRX3: AT+UCAST(B) and AT+MCAST(B) can now also use a Binding table entry as target address
- ETRX3: when using destination address FE, binding table is searched against S40 and S42 for the first entry that matches source endpoint and cluster ID
- ADC is auto-calibrated every 1000th measurement
- ETRX3: By setting bit 23 of S11 PC7 will indicate the status of the DMODE (high = active, low = inactive). PC7 needs to be defined as output in S16 and can be overridden using S18
- The Power level set in S01 takes effect before joining a network
- ETRX2: Increased Address Cache Size to 19
- Extended the Address Table by one entry (06) which contains the address of the sender of the last incoming UCAST, SCAST or BCAST
- S11 bit E (enable boost mode) now takes effect immediately instead of needing a reset
- S0B, S3B &S3C can now contain non-printing characters, including \0
- SEDs and MEDs in power mode 2 no longer draw high current when they lose the PAN

Registers and Commands affected	Indirectly affected
- AT+LBTABLE - AT+BSET - AT+BCLR - AT+BTABLE - AT+BIND - AT+UNBIND - S11 - S15 - S3B & S3C	
Upgrade information available None	**Upgrade Note Details** - After upgrading a factory reset will be conducted

R308 – 25/6/2012

Changes

- Fixed bug that restricted the number of end devices per router
- Corrected response to ATREMS where <etx> was not the final character
- Fixed ETRX357-LR not having PC5 configured automatically as TX_active
- Corrected response to bootloader option 3

Registers and Commands affected	Indirectly affected
- ATREMS - AT+BLOAD - S15	
Upgrade information available None	**Upgrade Note Details** - After upgrading a factory reset will be conducted

R309 – 30/07/2015

Changes

- Updated to Znet5.4.0
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- Bit 1 of S0A disable the display of received interpan messages when set
- Bit 6 of S0A appends RSSI and LQI to "RX:" prompts
- Unless Bit 1 of S0F is set unhandled messages received by Endpoint 1 are now also displayed using the "RX:" prompt (Bit 1 of S0F is a high level disable for the "RX:" prompt).
- Bit 8 of S0F is now used to enable showing unhandled messages sent to endpoint 1 and above (formerly 3 and above).
- Bit 9 of S0F can be used to disable the SWRITE Prompt
- Bit A of S0F adds remote endpoint and NodeID to the ACK and NACK prompts in the format ACK:<sequence in 8-bit hex>,<endpoint in 8-bit hex>,<NodeID in 16-bit hex> for profile Ids other than the default Telegesis one
- Bit B of S0F enables NODELEFT prompt at coordinator to indicate that a device left the PAN
- Bit C of S0F causes message payload of RX prompt to be displayed as hexadecimal instead of ASCII characters
- Bit D of S0F can be used to disable handling ZDO exchanges other than by using the RX prompt
- Bit E of S0F also adds RSSI to AT+PANSCAN report
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- Increased MAC timeout in S4F to 7.68s to match Home Automation recommendations
- Fixed rare (<1ppm) occurrence of TX character loss due to non interrupt save code
- Fixed beginning response to AT+TOKDUMP with "\r\n"
- Fixed doing a re-join instead of a clean join in case of joining a network the node was previously part of
- Improved throughput of the DMODE by triggering sending of packets 20ms after the last incoming character was received.
- Increased TX buffer of serial port to 256 bytes
- Fixed output power reverting back to the level the network was joined with after a reset in case S103 is set and power was changed in the meantime
- Fixed ATSALL broadcast addresses being overwritten by S102
- Fixed incorrect destination endpoint in RX prompt when message is a multicast
- ETRX357-LRS and ETRX357HR-LRS modules are programmed with the MFG_CCA_THRESHOLD token set to offset the gain of the LNA
- ETRX357-LRS and ETRX357HR-LRS modules have default power setting in S01 reduced to -17
- ETRX3 Modules natively programmed with R309 are programmed with the updated standalone bootloader R102.
- Tracking messages are only sent when device is in network
- Removed extraneous byte from payload of AT+SIMPLEDESC
- Fixed AT+LBTABLE not displaying the full table
- Prompts "Bind" and "Unbind" are now terminated using \r\n
- Binding Table size had to be reduced down to 24 entries to save simulated eeprom space
- Firmware now ensures background scan for joinable networks is completed before executing new active or passive scan
- Fixed invalid APS frames sent by functionality sending messages triggered by S28 (at network join)
- Fixed incomplete command being completed by the data of previously executed command
- Increased blacklist for AT+JN from 4 to 10 Networks
- Added Power Mode 4, which is identical to PowerMode 3 except that device does not wait for any pending acks before going to sleep
- COO and routers cannot be put into a sleep mode
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- Added AT+REMZ Command to reset remote node
- Added AT+EDBIND to request end device binding
- Added AT+SENDUCAST, AT+SENDUCASTB, AT+SENDMCAST and AT+SENDMCASTB commands to send more generic ZCL and ZDO messages
- Added AT+INTERPAN and associated receiver prompt
- Added time commands AT+SETTIME, AT+GETTIME, AT+SYNCTIME
- AT+PANSCAN now has parameters to filter responses by joinability and channel mask. Scan window length can altered. RSSI can be reported
- AT+KEYUPD will distribute the Key provided in S08 instead of a random key when the key in S08 is valid (non zero) and is not currently in use.

R309 – 30/07/2015

- Functionality 0018 can now also address multicast bindings (only) when binding ID is specified in S3B
- Added functionality 0402 to allow other GPIOs to be used for indication
- Fixed function 2001 losing the first three characters after a reset
- Fixed function 24xx not controlling other timers properly
- Added build in functionality 53xx,54xx,55xx and 56xx to mirror functionality of 003x,004x,005x and 006x, with extended parameter range to suit increased GPIO count on ETRX3 series modules

Registers and Commands affected	Indirectly affected
- AT+JN - AT+LBTABLE - ATSALL - AT+SIMPLEDESC - AT+EDBIND - AT+SENDUCAST - AT+SENDUCASTB - AT+SENDMCAST - AT+SENDMCASTB - AT+INTERPAN - AT+SETTIME - AT+GETTIME - AT+SYNCTIME - AT+KEYUPD - AT+REMZ - AT+DMODE - AT+PANSCAN - S01 - S0A - S0F - S10 - S11 - S39/S3A - S4F	
Upgrade information available R309 is not availabe for the ETRX2 series	**Upgrade Note Details** -