

Nano_Link Change Record

V1.0 First release

V1.1 02/10/97 register sequence within data block changed
Also copies alarm flags to Bits 4..7 of digital i/p byte

V1.2 04/11/97 Save counts in NOVRAM & tests NOVRAM on power-up
Also adds 4 sec pause before new sniff in MTU mode to save power

V1.21 Adds leased line option. Also corrects bug that prevented analogues being sent from a Nano_Link masterstation.

V1.22 01/06/98:

- a) Restore_counts modified to flash error if NOVRAM faulty
- b) Reading analogues & battery volts averaged over 256 samples to reduce errors due to mains power supply noise

V1.23 03/07/98:

- a) Fixes bug introduced in V1.21 which caused radio TX to be switched off before it had finished sending the last char, thus corrupting the CRC

V1.30 11/09/98:

- a) Compatible with new internal leased-line modem (including low power sleep mode)
- b) Fixes bug which caused higher current consumption in fully-equipped units when asleep (reset was held low)
- c) Current further reduced by reducing RTU_WAKEUP_ADVANCE from 5 secs to 2 secs.
- d) Masterstation can now work with battery-powered outstation

V1.31 15/10/98:

- a) Comms routines modified to reduce comms fail errors
- b) Repeater function modified to accommodate future option for unsolicited messages from outstations
- c) Analogues now read with 12-bit resolution (?? accuracy!)

v1.32 04/11/98:

- a) Fixes bug introduced by v1.31 (c) which prevented RSSI from being read correctly
- b) If the 1 sec timer had excess latency, tmr1 could count FFFF, 0000, 0001, 0002, 8002, 8003...
If ccp2 was set to 8001, a 64Hz tick could take 1 sec!
Fixed by setting LSB of ccp2 to 0 and doing 64Hz tick routine after every 1 sec routine.
- c) All accesses to counts and dScanTimer1_2s now have interrupts disabled to prevent risk of corruption

v1.33 18/11/98:

- a) A base-station working with a battery-powered outstation did not correctly output analogues. Bug fixed
- b) 12-bit analogue reads introduced in V1.31 returned the wrong LSB. Bug fixed.

v1.34 30/11/98:

- a) Analogue I/O now calibrated via test routines (address 252)
- b) Shaft encoder option added, but not debugged
- c) Battery-powered o/s can now return 12-bit analogues
- d) Low battery alarm level changed from 3.5V to 3.65V, since tests have shown this to be the level from which a battery o/s will die after approx 30 days at 15 minute polling

v1.40 22/04/99

- a) Shaft encoder interface added
- b) Display module added
- c) Outstation generates comms fail alarm on dig o/p 1 if not addressed within twice normal scan rate (+10 secs)
- d) Heartbeat LED indicates fault conditions:
constant flashing (as in previous versions) = OK
3 flashes out of 4 = Comms Fail
2 flashes out of 4 = Local battery low
1 flashes out of 4 = Remote battery low
- e) Station addresses 225..250 define base-station interrogating outstation address (StationAddress - 224) to reduce chance of interference. S1 = aaaaa111 where aaaaa = outstation add (1..28)
- f) RSSI now calibrated for range -15dBuV...+25dBuV
- g) Base-station gave wrong analogue outputs in slow scan mode. Bug fixed.
- H) Analogue o/p calibration was not accurate. Bug fixed.
- i) Radio Path Test set now implemented with alphanumeric display when s2.7 = 1, S2.8 = 1 at base-station. Base-station is enabled by pressing any button on display module. RSSI & remote RSSI are also copied to Analogue o/p 1 & 2
- j) Radio commissioning mode added, when S2.7 = 0, S2.8 = 1. RSSI & remote RSSI are copied to Analogue o/p 1 & 2
- k) Nano_Link will now accept one digital input expansion module (address 0) and one digital output expansion module (address 1)
- l) Radio channel can be set by Switch 2 or by display module (whichever was the last to change) to ease use of radio path test set
- m) Transmit power can be set in software instead of using pot
Level calibrated using extension to Test Mode 252.
Level viewed and selected using extension to Test Mode 253.
- n) Option for 300 baud transmission dropped (to free S2.6)
- o) Slow transducers can now be used with a battery powered outstations, by setting S2.6. Extended time = 10 secs.
Normal time = 100ms.
- p) Battery volts measurement corrected to allow for volt drop across filter resistor in power supply

v1.41 28/07/99:

- a) Occasionally crashed when used with digital i/p expansion module, because Nano_Link timed out waiting while digin was compiling its CRC. Solved by extending scl1 time-out from 1ms to 20ms and adding 2ms delay in ReadDigIP
- b) Now sends software version to display in DISPLAY LOGO mode

v1.42 15/09/99:

- a) When using slow transducers, a message addressed to another o/s received during transducer warm-up time would send the o/s into sniff mode. Bug fixed.

v1.43 15/12/99:

- a) Basestation did not flag alarms properly when using battery-powered outstation. Bug fixed
- b) NOVRAM test did not work. Fixed
- c) Shaft encoder routines speeded up to reduce power
- d) Shaft encoder enable flag now stored in NOVRAM
- e) Under certain circumstances the DAC could be left active when asleep, increasing current consumption from ~27uA to ~600uA. Bug fixed.
- f) Battery-powered outstation could stay awake longer than necessary, wasting battery power. (Bug introduced in v1.42). Bug fixed.

v2.00 18/10/00:

- a) Adds exception reporting
- b) Low power scan rate range extended from 0xFFFF secs (18 hours) to (0xFFFF - 900)*2 secs (35 hours)

v2.01 04/04/01:

- a) Mains powered o/s did not raise 12V until it was first called Fixed.
- b) It was not previously possible to use battery-powered repeaters. A repeater will now stay awake for a time defined at the end of a battery o/s data request command (which is normally set in the b/s to be scan window + 5 secs), so will see commands to be forwarded. If no time is appended, default is 5 secs as before.
- c) Alphanumeric display affected analogue outputs in test mode Fixed.
- d) Processor changed to 16LC77 or 16LF877
- e) When not radio S2.1 now selects 1200 baud (off) or 300 baud (on), for compliance with Securestream 300 modems

v2.10 24/08/01:

- a) Re-written in C
- b) Battery volts now assumes 5Vsw rail to be 5.4V, as on Iss 7 PCB. NB using this software on older issue PCB's will result in battery volts reading about 7% low.
- c) Outstation generated comms fail o/p if not interrogated for 1 minute. In slow scan applications this caused problems if using digital outputs. Fixed by measuring time between successive scans and setting comms fail time as scan time + 60 secs.

v2.11 03/09/01:

- a) Leased line base-station didn't work. Bug fixed
- b) Sleep current rose from ~50uA to ~500uA after 15 secs. Bug fixed
- c) Leased line outstation sometimes did not power down in sniff mode. Bug fixed.
- d) Heartbeat flashing of fault conditions was incorrect. Bug fixed.

v2.12 02/10/01:

- a) Reading battery volts sometimes didn't work. Fixed.

v2.13 12/12/01:

- a) Adds 5 minute time-out to radio path test set mode to prevent running batteries down. If it times out, switch off ENABLE on display for 5 seconds, then switch on again.
- b) Analogue o/p's had offset error because correction was subtracted, not added. Fixed.
- c) Did not read/write expansion modules. Fixed
- d) RSSI was updated by messages with wrong address. Fixed
- e) Base-station could become inadvertently configured for shaft-encoder. This corrupted RSSI and battery volts. Fixed
- f) Reading battery volts only worked if RSSI was calibrated BEFORE analogue inputs. This was due to provision made for reading a 3rd analogue input instead of battery volts. However, since the required hardware has not been implemented, this provision has been removed.
- g) Shaft encoder did not operate correctly. Fixed

v2.14 29/01/02:

- a) Did not work properly in sniff mode. Fixed
- b) Did not work properly with 30 second warm-up transducers. Fixed
- c) Provision added for transducers needing 1 second warm-up. New mode is set by S2.678 = 110.
- d) Fixes bug introduced a V2.10 which prevented reporting of counts from battery-powered outstations.

v2.15 18/02/02:

- a) Mod v2.13 (d) resulted in outstation not always returning correct RSSI to basestation. Fixed.
- b) Reset line to digital output was held low when asleep, giving high quiescent current (~400uA). Bug introduced at v2.10. Fixed
- c) Outstation always sent response direct to base-station, even if it was accessed via a repeater. Bug introduced at v2.10. Fixed.

v2.16 07/03/02:

- a) Did not work as a repeater. Bug introduced at v2.14. Fixed

v2.17 22/03/02:

- a) Adds ability to fit 1 or 2 7075-2 displays to show analogue outputs
- b) If an outstation sent an exception report due to a change of digital input, it didn't allow an analogue settling time. The exception report therefore reported the analogue inputs as being at full scale. Fixed.

v2.18 29/05/02:

- a) An outstation could fail to respond if it was used as a repeater and the network configuration is changed so it is no longer a repeater and it is accessed via a different route. Fixed
- b) RSSI was not clamped to keep within -15..+25dBuV. Very strong signals could read > 25dB. Bug introduced at V2.13. Fixed
- c) Shaft encoder function had not been tested after v2.10 re-write. Bug fixed.
- d) Alpha-numeric display did not show input status for battery-powered outstations. Bug fixed.

v2.19 04/03/03:

- a) A base-station resets whenever there is a change on any digital input. This causes the digital and analogue outputs to briefly clear. Bug introduced at v2.10. Fixed.

v2.20R 13/05/03:

- a) If configured as a base-station, 12V was dropped every 2 secs in the event of a comms fail. This caused digital outputs on an expansion module to also briefly drop out. Bug fixed
- b) If using slow (30sec) transducers on a battery o/s, and exception scan rate is set to < 30 sec, o/s should stay permanently awake. This is only of use for test purposes, but it didn't work. Fixed.
- c) Adds Mains Fail alarm (not used with battery powered units)
- d) Integrates GSM mode by building with -DGSM switch
- e) Initiation delay added for 4 digital i/p's.
- f) The radio initialisation routine may not work if called to recover from a fault condition. Problem discovered in Micro_Link s/w v2.24. Bug fixed.
- g) Will now work with either 24C02 NONVRAM (as originally fitted) or 24LC65 NOVRAM (as needed for GSM).

v2.21R 21/12/03:

- a) Fix introduced at V2.20R (f) prevents operation with leased line modem. Fixed.
- b) Various minor changes to bring into line with NanoGSM V1.00.

v2.22 24/02/04

- a) Leased line versions do not allow analogues to be calibrated
- b) Various minor changes to bring into line with NanoGSM V1.00.

v2.23 21/04/04

- a) Didn't work as battery repeater, because of fix 2.18(a). Fixed
- b) Various minor changes to bring into line with NanoGSM V1.00.

v2.24 11/11/04

- a) Didn't read digital input expansion module. Bug introduced at v2.23(b). Fixed.

v2.25 15/12/06

- a) Adds option for 4 second warm-up
- b) If b/s had enabled exception reporting then is re-configured to disable it, the Nano_Link o/s would continue to report that exceptions are enabled, so the b/s would repeatedly send commands to disable it. Fixed.

v2.26 01/02/07

- a) If using a combination of battery & mains outstations, battery o/s's stayed awake if polling mains at less than 10 seconds, or if mains o/s's had failed. Problem was rOUTSTN.c line 182. Fixed
- b) SlowScanMult deleted.