

# Data\_Link 2000

## APPLICATION NOTE AN001

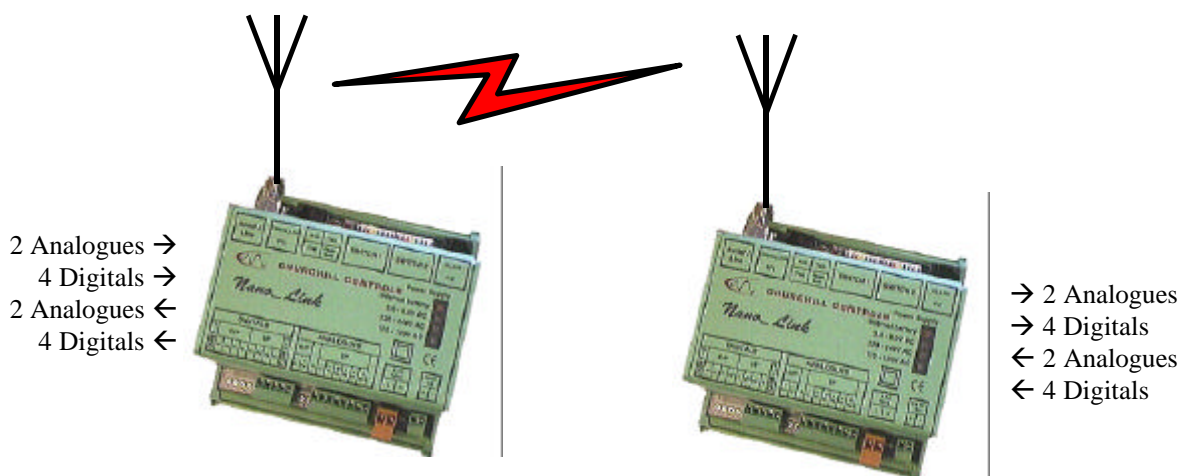
Implementing a point-to-point link from two *Nano\_Link*s

### Summary

Many telemetry applications need to send a small amount of data between two points, as cost-effectively as possible. *Nano\_Link* is ideal for these applications, since it is fully self-contained and low cost. This application note describes the means of implementing a point-to-point system using two *Nano\_Link*s

### Outline

Each *Nano\_Link* module has 2 analogue and 4 digital inputs, plus 2 analogue and 4 digital outputs. Two modules can thus transmit 2 analogues and 4 digitals in each direction (using either radio or leased lines):



## Inputs and Outputs

All analogues are scaled 0...20mA, so can be used to send either 4...20mA or 0...10mA signals. In fact they will faithfully reproduce signals up to 20.5mA, allowing faulty transducers to be identified.

All digital inputs are compatible with volt-free contacts, although they can also be used to monitor DC voltages of up to 24V. They supply a wetting current surge to overcome reliability problems associated with 'dry switching', and include switch bounce filtering.

All digital outputs are volt-free relay contacts capable of switching up to 60VDC/1A/30W.

## Method of operation

One unit is configured as a base-station, and the other as an outstation. All communication is initiated by the base-station. It will send a message to the outstation requesting a copy of its input states, then send another message of a different format to copy its inputs to the outstation.

## Communications

Communications can be either by radio or by leased line (see AN004 & AN006). De-regulated radio does not allow continuous communication, so there could be a time lag between inputs and outputs. Slow-scan comms also permits power saving at the outstation:

## Power Supply

The base-station includes a mains power supply (110V or 230VAC) with battery back-up.

The outstation can be either mains powered or battery powered. It is impractical to use digital and/or analogue outputs on a battery-powered outstation, so these are equipped with inputs only. To conserve power, outstations operating from batteries enter a sleep mode when not communicating with the base-station, during which they continue to count pulses, but are otherwise totally inactive. See Application Note AN003 for a description of battery operation.

## Configuration

All operating parameters are configured on DIPswitches. There are two switches, marked S1 and S2. They are fully described in the *Data Link 2000 Operator's Manual*, but can be summarised

as follows:

### **Outstation:**

S1	S2
12345678	12345678
10000000	cccc000b

Where 1 = on, 0 = off

cccc = radio channel number (must be the same for both base-station and outstation, and a channel not in use by others). Ignored if using leased lines.

b = 0 for battery power  
1 for mains power

### **Base-station:**

S1	S2
12345678	12345678
00000000	cccc00s0

cccc = radio channel number (as above)

s = 0 for continuous comms  
1 for slow-scan comms

Continuous comms can only be used when using leased line comms with a mains-powered outstation (or when testing a radio system). Slow-scan comms will transmit every 10 seconds if the outstation is mains powered, or every 15 minutes if it is battery powered (see S2/7 above). This minimises power consumption at the outstation and allows others to share the radio channel.

## Alarm Handling

The base-station generates an alarm state if it loses communication with the outstation. This is logically ANDed with the first digital output. This output therefore normally mimics the first digital input at the outstation, but reverts to the OFF state in the event of a comms failure. It can thus either be used as a comms fail alarm (by hard wiring the first input at the outstation to be permanently energised) or as a normal digital output.

Each module monitors its internal DC supply voltage, and generates an alarm if it drops to a level which suggests mains has failed and the batteries are running down. The alarms from each module are logically ANDed with the second digital output at the base-station. This output therefore reverts to the OFF state if the battery in either unit runs down. It can be used as a battery low alarm (by hard wiring the second input at the outstation to be permanently energised) or as a normal digital output.

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