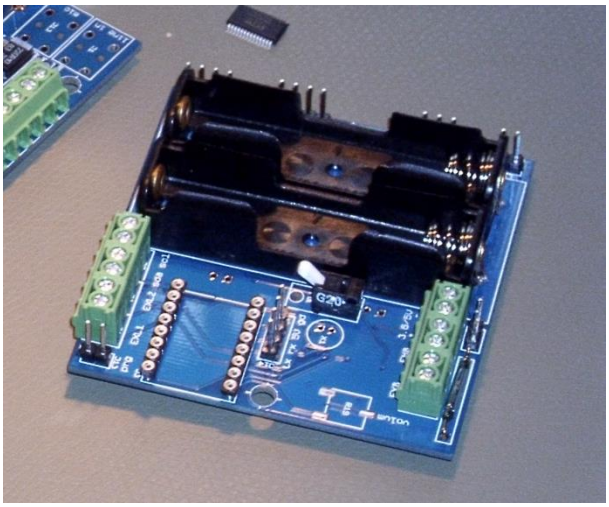
DATA SHEET

NURSE CALL AUDIO STATION

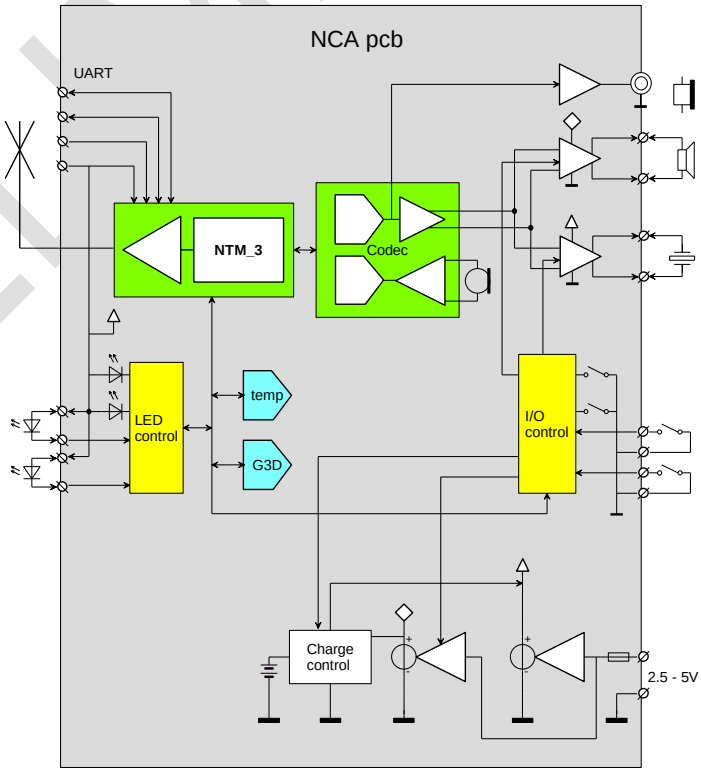
NCA



Article number:	NCA VORN_basic *NCA VORN_aux* *NCA VORN_sensor*
Size:	65 x 65 x 18 mm
Function:	Interface between digital signalling inputs and a digitized audio stream and the Ninthway radio network
Standards:	EN300-220-1 EN300-220-2 EN300-220-3 IEEE 802.15.4 EN54-25 IIC

Specifications

Functional diagram



NURSE CALL AUDIO STATION

NCA	
Description	The NCA combines the Voice Over Radio Network (VORN) capability with the functionality of the NCB, the multipurpose warning station. It is equipped with a low voltage audio amplifier for magnet speakers and with a high voltage audio amplifier for electret speakers. It can either be used as a (spoken word) sounder, as an announcement device or as an intercom device.
NCB warning	It provides 4 switches, 2 built in and 2 external. It provides 4 LED indicators, 2 built in and 2 external. A change of state of one of the inputs triggers the transmission of a data frame with information for the receiving application program. The NCB comes with a number of pre settable operation modes called flavours that couple the input signals to the indicators. Flavour: 1. Offuse — simple I/O device 2. Door — door/window contact 3. Indicator — wireless side indicator 4. Alarm — independent button warning station 5. Nsalarm — dependant button warning station 6. Triple pull — pull cord warning station 7. Syncalarm — dependent two button warning station to be used with wireless Indicator
VORN	It is possible to maintain an audio stream over the Ninthway High Secure Network and produce a life audio link. For that purpose the NCA houses a codec that can open an audio path from the NTM transceiver to several audio outputs. In reverse an audio path can be set up that conveys audio signals from the built-in microphone to the NTM transceiver. In this way a half duplex audio communication over the Ninthway Radio Network can be set up. The codec samples the audio signal at 16 kHz and compresses it using an ADPCM protocol. The digitized audio signal is transmitted @ 500kpb on the BBN frequency band. Full duplex operation requires the use of two audio bands. It requires the use of a double NCA at both sides and repeater stations need to be equipped with a second BBN transceiver that operates on the second audio frequency. Alternatively the codec has space to store pre-recorded messages that can be

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	played with a simple command to the NCA.
Warning station connections	Built in pull cord switch. Built in reed switch. 2 sets of 2 terminals for 2 external buttons. 2 sets of 2 terminals for external indicators. 4 UART pins, gnd, 5V, rxd, txd.
Audio connections	Electret microphone with built-in AGC. Output pinheads: • 1V pp voltage line output. • Current source line output. • 3W@ 4Ohm loudspeaker connection (Class D). • 4 pinhead I2S digital audio I/O. • 20 V electret speaker output. • Digital I2S audio output bus.
Options	Temperature sensor MCP9800. -10 to +85 °C. 3D Accelerometer ADXL345. Li-ion auxiliary power supply with built in charge controller.
Jumpers	JP8: input connection for line input socket JP12: headphone connection J15: charge select mode 1-2: current; 2-3 voltage controlled
Parameters	See application note 7; Manual for the nurse call audio station
Indicators	LD1 Green LED LD2 Red LED LD3 external LD4 external
Power supply and current consumption	Supply voltage: 2 Terminals 2.5 – 5 V, 0.25 - 1.5 A. Reverse polarity protected. Feeds two supplies. Primary supply: for NTM, NCB and codec: @ 250 mA. Secondary supply: for built in audio amplifier using same power supply input 5V @1.5A. Can be shut down to save power. Option: Auxiliary power with 500 mA charger, Li-ion A-cell (1200 mAh) when secondary supply present.

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Radio parameters	Audio data is transmitted real time over the network in 80 frames per second using the CSMA-CA protocol. This exides the duty cycle regulations for bands like 868 MHz. Therefore VORN operations takes place on the 863 – 865 MHz band. This requires gateway and repeater stations to have their BBN transceiver set to the 863 MHz band and their data rate to 500 kbps. The settings for the sensor and actor network band stays @ 868.3 MHz and 100 kbps data rate. Only during VORN operation will the transceiver on the NCA set itself to the BBN band and data rate.
Audio parameters Line output Audio amplifier for coil speaker HV output **Codec audio output**	The NCA houses four audio outputs. The head connection (j10) 1-2-3 provides two single ended line/headphone outputs. 1-2 current output: max 6 mA 2-3 voltage output: max 1Vpp Minimum load impedance: 5 KOhm DC_bias: 1.2V Mag spkr connection provides BTL coil speaker output. Output power @ 4 Ohm 2.30 W Output power @ 8 Ohm 1,36 W Harmonic distortion @ 4 Ohm 0.03% Harmonic distortion @ 8 Ohm 0.02% Fixed amplifier gain: 18 dB SNR 105 dB Bandwidth: 0 – 50 KHz. HV output, class G ceramic speaker driver. Max output voltage: 20 Vpp Clip-and-plop level: -67 dBV Continuous output power: 2.4 W Maximum capacitive load: 1µF Fixed amplifier gain: 32 dB Bandwidth: 0 – 10KHz SNR 105 dB Standard volume attenuation: 12 dB Minimum attenuation: 0 dB Maximum attenuation: 63.75 dB AGC default max gain: 28 dB

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	AGC maximum gain: 47 dB
NTM mode	The NCA-mode is activated using function 7.
Mounting instructions	For the best performance of the radio transceiver mount the PCB with the antenna upright when possible.
Additional information	Datasheet NTM_3 Application note 1: Programming the NTM Application note 2: Ninthway high secure radio network Application note 7: Manual for the nurse call audio station