

ND5052v4 Display Controller

EPROM VERSIONS

The label indicates the type and version number, checksum and number of digits. Additional info may be MPU type and speed plus type of display.

Common standard types are:

- ▶ 100 mm LCD Serial# 094001 through 950149. 1 to 8 digits
- ▶ 100 mm LCD Serial# 0950150 up. 1 to 8 digits
- ▶ 230 mm LCD all items. 1 to 8 digits
- ▶ 200 mm LED up to Serial# 047028005. 1 to 8 digits
- ▶ 200 mm LED Serial# 047028006 up. 1 to 8 digits
- ▶ VT-100 LCD MTN4 8x16

▶ ▶ ▶ NOTE! Always specify serial number of display to ensure correct EPROM

AUTO/MANUAL SWITCH & ADDRESS SELECTOR

The Dipswitch array will allow you to select Automatic Mode (default ON) where communication line is monitored for detection of communication parameters like baudrate, parity and message format. When this mode fails to display your message, the Manual Mode will allow you to alter the parameters by use of a terminal or the optional IR Remote Control.

Note that flipping the Auto lever from ON to OFF forces the current setup to be stored when the PCB is powered.

Address levers are only operated for specific protocols; default is all OFF.

TEST BUTTON

A pushbutton is available that serves two different purposes:

▶ During power-up, pressing the button will make the 5052 enter communication test. It will require that a display is connected to the Display Connector and you will see that data from the serial line is fetched and displayed as 01-39 meaning that character buffer location 01 holds 39 hexadecimal (57 dec) i.e '9'. Pressing the Test Button will display the next collected character.

▶ During normal operation, pressing the Test Button will step you through the pre-defined protocols available. If the Auto Mode finds no suitable match, use this feature to manually search for a workable protocol handler.

This product is tested with our products and will comply to CE requirements. European RoHS is fulfilled.

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user's guide

QUICK DATA

Size:	95 x 60 mm
Mounting:	65 x 50 mm or 50x50 ø4.2 x6 holes.
Power Supply:	8 .. 28 V dc max 25mA
Grounding:	Chassis in single mounting hole
Temp. range:	-40 to +85°C
Interface:	RS-485/422, RS-232 and isolated 20mA TTY
Communication:	300 to 38400 baud, 7 or 8 databits, NEO parity
Setup method:	PC terminal or IR remote control
Backlight:	sourcing max 350 mA
Display:	serially clocked data, 5V max 20 mA sink proprietary

Serial async receiver converts various message formats to readable text to be presented on ND displays.

This firmware compatible Controller replaces previous versions of ND5052.

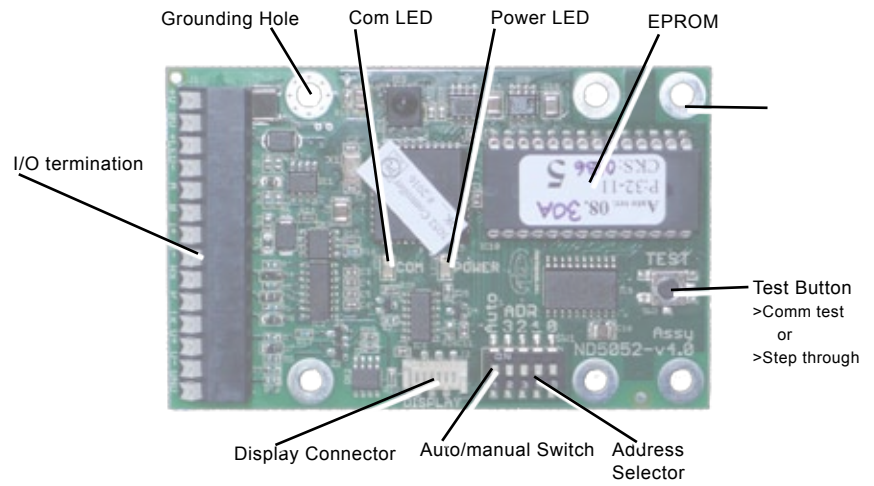
ND20080c08



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+V :	Power input 24Vdc	I+ :	TTY positive input
0V :	Power input (return)	I- :	TTY negative input
LED+ :	Output 24Vdc to backlight	Rx :	RS-232 input
LED- :	Output 0V to backlight	P :	RS-232 program(not used)
A :	RS-485/422 positive input	Tx :	RS-232 output
B :	RS-485/422 negative input	O+ :	Serial output +
		O- :	Serial output -
		GND :	Return for RS-232 Rx,Tx,P



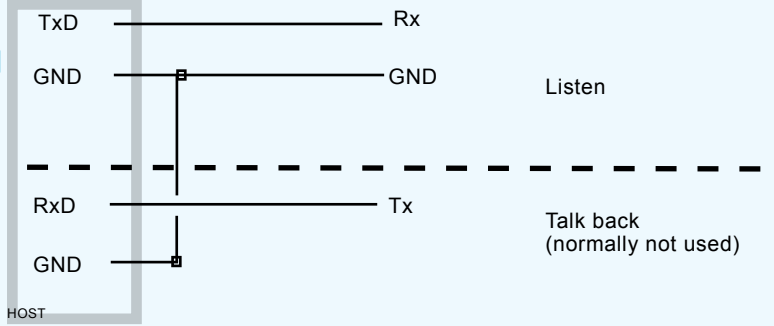
When power is applied, the Power LED should be stably lit. The Com LED will blink as data is received. The intensity of the Com LED will vary with communication speed and frequency.

To tailor the controller behaviour, various parameters may be set by use of a PC or through the use of IR Remote Control. See separate description for details.

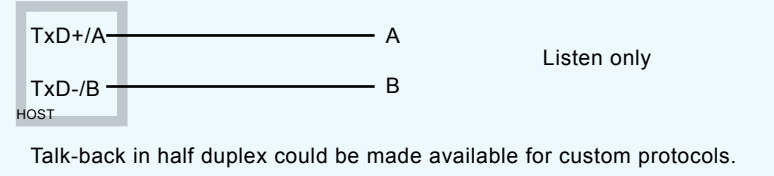
Storing the active setup could be done when in Auto Mode and you are satisfied with the operation of the display (power must be applied and data displayed). Flick the Auto Switch to OFF, the display should respond with „Stored“. Now let the Auto Switch remain in OFF position. Recycle power to check that operation is as expected.



RS-232 CONNECTION

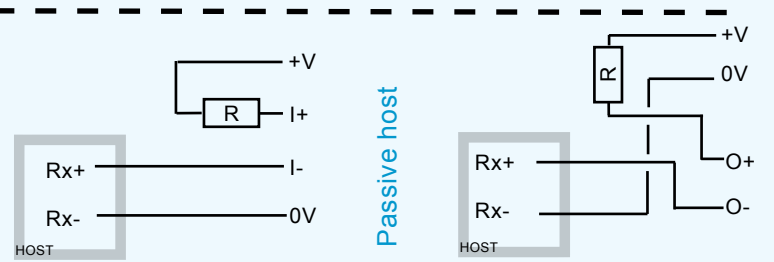


RS-422/485 CONNECTION



whenever possible:
•Always use twisted pair for signal and return.
•Shielding should be used, grounding one end only!!

TTY 20 mA CONNECTION



R could be 470 Ohm to 1 kOhm depending on supply voltage

The ND5052 Display Controller has a host of predefined message formats (called protocols) that could be automatically detected or manually selected. A list of protocols is available on the Norsk Display website.

To set the parameters, please refer to the User's Guide for details. Depending on what parameters to change, the Test Button, IR Remote Control (option) or Terminal Hookup could be used. Terminal hookup could be used to have full control over operational parameters.

As a way of tailoring the Readout for special message formats, a freely adaptable handler is available as protocol selection P:00. Using this protocol enables the parameters listed below to handle incoming messages. Each parameter must be correctly set to achieve the desired behaviour, and a list of protocols could be downloaded with a Windows™ utility program from the ND website.

Use either a terminal program or the free utility program to set the parameters. To enter programming mode, repeat <Esc>P 16 times at the currently set baudrate. The display will then respond with informational text, while the Readout will display „Prog“. Only simple configure commands will then be accepted at 9600,8,N,1. After the programming sequence, communication is set to the selected speed.

Available commands are

S [enter]	Status - list all parameter settings
? [enter]	Help - list all available commands
V [enter]	list software number and Version
C=1200 [enter]	set Communication speed 300-19200
P=N [enter]	set Parity N,E,O
D=8 [enter]	set Databits to 7 or 8
A=01 [enter]	set Address 00-99. (default=00 means addressing inactive)
PS=02 [enter]	set Protocol Start character (0=not used, no particular start character)
PE=13 [enter]	set Protocol End character (Example show '13' -i.e. Carriage Return)
TO=05 [enter]	set TimeOut seconds (0 means no timeout used)
TI=03 [enter]	set Ignore Characters after start
TL=07 [enter]	set Text Length = number of valid characters
RS=send [enter]	set Request String (^A for sending ASCII 01)
SP=02 [enter]	set Sign Byte Position (0 for not used)
SB=02 [enter]	set Sign Bit position in Sign Byte (0 to 8)
FT=kg [enter]	set max 3 character trailing text.
BP=5 [enter]	set Control Byte Position (0=not used)
BM=07 [enter]	set Control Byte Bit Mask (0/255=not used)
BB=06 [enter]	set Control Byte Compare Byte
PP=0 [enter]	Particular Protocol (0=normal). Special adaption for specific customers.
DL=5 [enter]	set Physical Display Length, i.e. number of digits
DJ=R [enter]	set Justification R=Right / L=Left
DP=2 [enter]	set number of Decimals (place fixed dp). 0 means no fixed dp.

EXAMPLE

To set the baudrate to 4800, issue the command:

```
Cmd [S=Status] > C=4800 [Enter]
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The PC/terminal will reply with an "OK" if accepted, else "* ERR".

Use the „S“-command frequently. The Readout will not start using the parameters before leaving the programming mode and a restart is done.

Programming utilities with predefined setups and contact information is available online at <http://www.norskdirdisplay.com>

Use RS-232 for programming, regardless of the interface to be used later.

STANDARD PROTOCOL DESCRIPTION

We have defined a standard protocol to be used where the connected instrument is fully programmable. This message format is known as „Norsk Display Standard Protocol“ and has two operating modes; non-addressed and addressed. These are used throughout the range of different products.

<STX>data<CR> where <STX>=ASCII 02d, <CR>=ASCII 13d
data includes minus sign (-), decimal point (represented by '.' or ','), leading blanks or zeros.

Addressing Control

By including a leading string <STX><SOH> AA will select display 'AA' ('00' to '99'). Full message string will be <STX><SOH> AA<STX>data<CR>
Address '00' will broadcast to all connected displays. Addressing is relatively seldom used.

INSTALLATION

Note that the wire arrangement between your instrument and the display controller will determine the behaviour and robustness of the system. As a general rule, always use a shielded cable with twisted pairs for each signal. Grounding the shield in the controller end only is the preferred way, but alternatively it may be grounded in the other end.

Ex:

RS-232 TxD and RS-232 Ground from the instrument uses one twisted pair. If you need answer back, use another twisted pair for RS-232 RxD and RS-232 Ground.

Use twisted pair also for remote power.

Shield could preferably connect to ground. Our 100mm LCD displays are delivered with a 4m shielded cable and the shield is directly connected to the enclosure.

