STANDBY®

When attention matters.

MCS-NX-8

DATASHEET

E11 **10R-0213006**

Contents

Warnings

The MCS system uses 6 pin RJ11 connectors and the MCS-NX uses RJ45 8 pin connectors, they utilize the same handsets and external CAN devices. Make sure you do not insert a RJ11 6 pin connector into the RJ45 8 way port. This will damage the pins and cause the CAN1 to go faulty on that connector. The above label is placed over the RJ45 connector on the MCS-NX to avoid this.

When connecting the power supply to the MCS-NX unit please ensure that the red connectors are seated correctly to avoid causing operational issues. For a short demonstration video click on the image above or go to https://www.youtube.com/shorts/nryPMNy-Mcc .

MCS-NXE

The MCS-NX product range is packed with features to suit the siren market, if you are looking for a lower cost solution that does not require a siren amplifier, take a look at the MCS-NXE range which caters for non-siren applications while using the same configuration software and system architecture as the MCS-NX range, this can be found in MDX00074_MCS-NXE-DATASHEET

1. Specification

1.1. Absolute Maximum Ratings

Supply Voltage: 32 Volts DC.
Supply Current: 40 Amps

1.2. Electrical Characteristics

Operating Voltage: 12-24 Volts DC

Current Consumption:
- With Siren Module:
  - Running: 105mA
  - Sleeping: 18.4mA
  - External Shutdown: 5.7mA
- Without Siren Module:
  - Running: 75.4mA
  - Sleeping: 15.0mA
  - External Shutdown: 5.5mA

Temperature
- Standby Temperature: -20 Deg C – 70 Dec C
- Operating Temperature: -20 Deg C – 50 Deg C

1.3. Power

1 x 70Amp DC pluggable connector.
2 x Ground / chassis connections.

1.4. Digital Inputs

1 x External Reset
1 x External Standby

1.5. Universal Inputs

6 x Universal Inputs

1.6. Analog Monitoring

Supply Voltage sense
Internal temperature monitor
High Output channel current monitors
Medium Output channel current monitors
Siren system current monitor

1.7. Outputs

4 x High Power, current and voltage protected outputs (20A per channel)
4 x Low Power Positive or Negative current protected Outputs (2.4A per channel)
2 x 100W siren speaker output.
1 x 5A internally fused Supply output

1.8. Communications

3 x CAN FD

1.9. Optional Extras

GPS Module
A GPS can be added to the unit by using the Part number with a -G1. This will enable syncing of flash patterns and provide an RTC for display.
Audio Intercom card
An Audio Intercom can be added to the MCS-NX by ordering a part number with a -A1. This allows for two addition 5W audio channels to play audio announcements over and an intercom system. This is currently only available with the MCS-NX-64.

2. Connectors

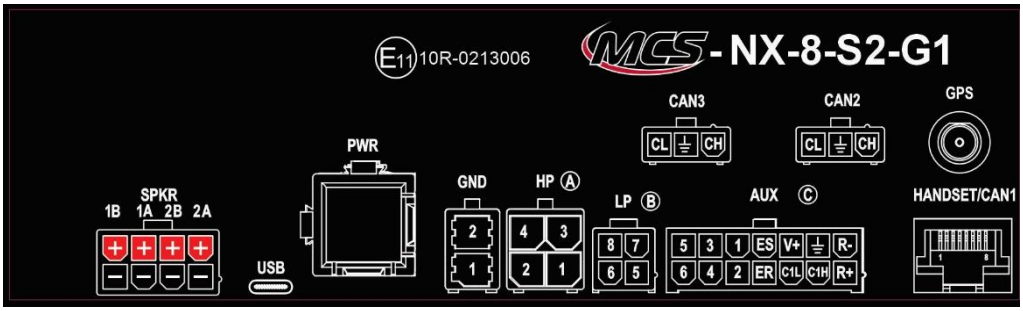


Figure 1 Connector Layout

2.1.1) ***GPS***

Pin	Name	Function
1	GPS	Connection for Active Antenna for GPS function (designated by G1)

2.1.2) ***SPKR -Siren Output (S1 and S2)***

Pin	Name	Function
1	2A-	Speaker 2 Channel A Negative Output
2	2B-	Speaker 2 Channel B Negative Output
3	1A-	Speaker 1 Channel A Negative Output
4	1B-	Speaker 1 Channel B Negative Output
5	2A+	Speaker 2 Channel A Positive Output
6	2B+	Speaker 2 Channel B Positive Output
7	1A+	Speaker 2 Channel A Positive Output
8	1B+	Speaker 2 Channel B Positive Output

2.1.3) ***PWR - Power Connection***

Pin	Name	Function
1	Supply	12-24V supply

2.1.4) ***GND - Power Ground***

Pin	Name	Function
1	Ground A	Chassis ground
2	Ground B	Chassis ground

2.1.5) ***Connector A - High Power Outputs***

Pin	Name	Function
1	High Power Output 1	User Defined High Power Output (Positive Switched 20A)*Note1
2	High Power Output 2	User Defined High Power Output (Positive Switched 20A)*Note1
3	High Power Output 3	User Defined High Power Output (Positive Switched 20A)
4	High Power Output 4	User Defined High Power Output (Positive Switched 20A)

Note 1 : HP1 and HP2 can be combined to achieve 30A by wiring HP1 and HP2 to the load in parallel. This is enabled in the configuration software.

2.1.6) ***Connector B- Low Power Outputs***

Pin	Name	Function
1	Low Power Output 5	User Defined Low Power Outputs (Positive or Negative 2.4) *Note2
2	Low Power Output 6	User Defined Low Power Outputs (Positive or Negative 2.4A) *Note2
3	Low Power Output 7	User Defined Low Power Outputs (Positive or Negative 2.4A) *Note2
4	Low Power Output 8	User Defined Low Power Outputs (Positive or Negative 2.4A) *Note2

Note 2 : all low power outputs when placed in drive low mode have a 800µA quiescent current. This may cause false triggering in very light loads. This can be remedied by placing a 1kΩ resistor across the load.

2.1.7) ***Connector C - Aux Connector***

Pin	Name	Function
1	Radio In +	Positive input for Radio re-broadcast
2	CAN1 H	CAN bus High connection
3	CAN1 L	CAN bus Low connection
4	External Reset	Positive switched Reset input
5	Universal Input 2	User defined input (pull-up or pull-down through 8.2kΩ or analogue)
6	Universal Input 4	User defined input (pull-up or pull-down through 8.2kΩ or analogue)
7	Universal Input 6	User defined input (pull-up or pull-down through 10kΩ or analogue)
8	Radio In -	Negative input for Radio re-broadcast
9	Ground	Chassis
10	Supply Output (Fused)	Supply feed through for external devices (4A Fused)
11	External Standby	Negative switched Standby input
12	Universal Input 1	User defined input (pull-up or pull-down through 8.2kΩ or analogue)
13	Universal Input 3	User defined input (pull-up or pull-down through 8.2kΩ or analogue)
14	Universal Input 5	User defined input (pull-up or pull-down through 10kΩ or analogue)

*2.1.8) **HANDSET/CAN1 - System Connector***

Pin	Name	Function
1	CAN1L	CAN bus Low connection (CAN-FD)
2	CAN1H	CAN bus High connection (CAN-FD)
3	MIC-	Negative Microphone input signal
4	Supply	Supply feed through for handsets (1A Fused)
5	Ground	Chassis
6	MIC+	Positive Microphone input signal
7	NC	No connect
8	PTT	Push to Talk

*2.1.9) **CAN3\RS485 Connector***

Pin	Name	Function
1	CAN3H\RS485A	CAN3 High (CAN-FD) or RS485A connection
2	No Connection	-
3	CAN3L\RS485B	CAN3 Low (CAN-FD) or RS485B connection

*2.1.10) **USB-C (Micro Rev1)***

Used with the MCS Configurator for programming the device
http://mheupdate.blob.core.windows.net/mcsnx-config-update/mcsnx-config-install.exe

*2.1.11) **CAN2 Connector***

Pin	Name	Function
1	CAN2H	CAN2 High (CAN-FD)
2	No Connection	-
3	CAN2L	CAN2 Low (CAN-FD)

*2.1.12) **RST - Reset Button***

Button for resetting of the unit.

*2.1.13) **SEL - Select Button***

Button for selecting what information is displayed by the LEDs on the unit. Also used to force the unit into bootloader mode.

*2.1.14) **DIP SELECT - CAN Termination***

Switch	Name	Function
1	CAN3 Termination	Activates a termination resistor on CAN bus 3 (120Ω)
2	CAN2 Termination	Activates a termination resistor on CAN bus 2 (120Ω)
3	CAN1 Termination	Activates a termination resistor on CAN bus 1 (120Ω)

*2.1.15) **SD – SD card slot***

SD Card slot for insertion of an SD.

3. System Description

3.1. Siren

The siren module supports up to 2x100W (8 Ohm) output speakers.

- NS – no siren module
- S1 – 1x100W or 100W split between both channels (2 x 50W)
- S2 – 2x100W

With the use of the powerful MCS-NX-CONFIG the siren module can be customized to suit the user's requirements.

The Siren module can be configured to perform the following functions.

- PTT (Handheld Microphone Broadcast)
- Radio Rebroadcast
- HRT (Horn Ring Transfer) to enable and disable siren tones.
  - Single Tap or Double Tap to Start modes.
- 4 (Minimum) industry standard siren tones, playable in any order
  - Wail
  - Yelp
  - Two-Tone
  - Pulsar
- Air Horn
- Low Fequency "BASS" mode

The Siren module also supports the following modes.

- Auto Scroll (Automatically cycles through all selected tones)
- Auto Start (Automatically plays tone when siren is enabled)
- Bass Enable (Run a low frequency tone)
- Bass Time (limit the low frequency to a set time)
- Volume Control (Allowing for low volume output for use in testing without being harmful to the naked ear)

3.2. Inputs

The External Reset input on pin 4 of connector C is used to force the processor in to reset state and is active high. The External Standby input on pin 11 of connector C is used to power down the entire system by forcing the internal regulators to turn off completely, this is an active low signal.

(Connector & Pin)	Analogue Range	Frequency	Pull-Up	Pull-Down
Input 1 (C12)	10V	✓	Configurable	Configurable
Input 2 (C5)	10V	✓	Configurable	Configurable
Input 3 (C13)	10V	✓	Configurable	Configurable
Input 4 (C6)	10V	✓	Configurable	Configurable
Input 5 (C14)	30V		Configurable	Configurable
Input 6 (C7)	30V		Configurable	Configurable

3.3. High Power Outputs

Each of the High Power outputs is independently capable of switching 20 Amps, but the overall current capability of the system is limited to the total specified for the selected device.

Using the MCS-CONFIG Software, the outputs can be configured for:

- Minimum Voltage Dropout. (Disables the output when the supply voltage drops below the set level)
- Maximum Current Protection (Disabled the output when the output current exceeds the set current level for a period of time)
- Output Function – A selection of flashing patterns is available.
    - Steady On
    - Alternating
    - Multi Flash
    - Penta Pulse
    - Penta Pulse (With Pause)
    - Cyclic
    - Arrow\Direction
    - Double Flash
    - Single HL
    - Mega
    - Quad-SAE
    - Quad-R65
    - Priority Levels – each output function has a user defined priority level to determine function takes precedence, this is determined by the functions position in the list, the higher up the list, the higher the priority.
    - Enable Inputs - Each output function can have multiple inputs. If **ANY** of the enable inputs is active, the output can turn on.
    - Inhibit Inputs – Each output function can have multiple inhibit inputs. If **ANY** of the inhibit inputs is active, the output will not be turned on. Inhibits take precedence over Enables.

3.4. Low Power Outputs

There are 4 positive or negative switching outputs. Each output is independently capable of switching 2.4 Amps, but the overall current capability of the system is limited to the total specified for the selected device.

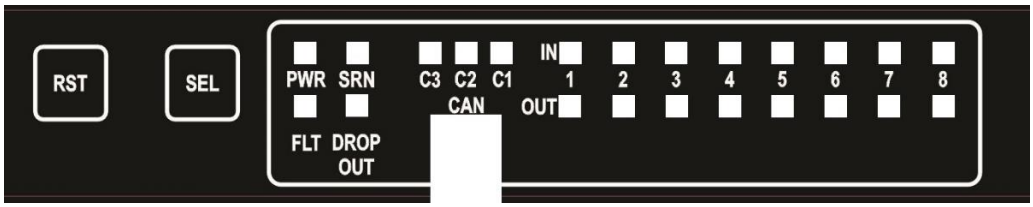
With the exception of current limiting (there are none for the low power outputs), the features and configuration setup are exactly the same as for the High Power Outputs. See Above for more information.

See Note 2 above in section 2.1.6 for information of negative switching quiescent current.

3.5. CANBus Serial Interface

The MCS-NX has three CAN FD full speed interfaces. The first interface is designated for local control using suitable MCS compatible remotes. CAN two is used for communications with the Vehicle and CAN three will be nominally used for telematics and other 3rd party applications.

3.6. Diagnostics And Troubleshoot



Modes of operation denoted by PWR LED

- Steady Red – Running (normal operation)
  - SRN (Siren)
    - Steady Green – Siren Running
    - Steady Amber – Siren Voltage Dropout
    - Steady Red – Fault
  - FLT (Fault)
    - Steady Red – Global fault present
    - Off – No Faults present
  - DROPOUT
    - Steady Amber – Dropout detected
    - Off – No Dropouts present
  - C1,C2,C3 (CAN1,CAN2,CAN3)
    - Green – Communications healthy
    - Amber -At least one CAN device not responding
    - Red – No devices responding
    - Off – CAN channel not used
  - OUT (OUTPUTS)
    - Green – Active
    - Off – Inactive
    - Red – Over current fault
    - Amber – Voltage dropout present
  - IN (INPUTS)
    - Green – Active
    - Off – Inactive
    - Input 7 LED
      - Purple Fast flashing- establishing GPS lock
      - Purple Slow Flash – one second timepulse
    - Input 8 LED
      - Red flashes faster the closer the unit gets to syncing with other MCS-NX units
      - Blue Steady once synced
- Steady Blue – Updating Slaves
  - SRN (Siren)
    - N\A
  - FLT (Fault)
    - N\A
  - DROPOUT
    - N\A
  - IN (INPUTS)
    - White – Overall update progress increasing from left to right
  - OUT (OUTPUTS)
    - Blue – Programming progress increasing from left to right

- Steady Cyan – Loading Configuration
  - SRN (Siren)
    - N\A
  - FLT (Fault)
    - N\A
  - DROPOUT
    - N\A
  - IN (INPUTS)
    - Cyan – Overall Config loading progress increasing from left to right
  - OUT (OUTPUTS)
    - N\A
- Steady Purple – Boot Loader
  - SRN (Siren)
    - N\A
  - FLT (Fault)
    - Green – Application CRC valid
    - Red – Application CRC invalid
  - DROPOUT
    - N\A
  - IN (INPUTS)
    - Red – Erase progress increasing from left to right
    - Green – Programming progress increasing from left to right
  - OUT (OUTPUTS)
    - N\A
- Steady Orange – Idle
- Steady Green – Going to Sleep
- Flashing Red – Unit is asleep in minimum sleep time
- Double Flash Red – Unit is asleep
- Steady White – Safe mode, system has experienced too many unexpected restarts, reset required.

3.8 USB Connector

The USB connector is a standard USB-C (Rev1 USB Micro) connector which allows programming of the device using the MCS-NX-CONFIG application. No external power is required when using the USB cable as this supplies the logic circuitry with the necessary power to program.

4. Revision History

Revision	*Comments*	*By*	*Date*
1V0	Initial Release	KJVR	2022/04/26
1V1	Updated to match the overall Datasheet	KJVR	2025/01/08