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Network Controller TCP/IP Technical Manual

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IOC Trzin fax: +386 1 56 10 744
Špruha 19 web: www.metra.si
SI-1236 Trzin, Slovenia

System: Metra Access Control and ELS Systems
Product Group: Network Controller
Types: • NCTCP
Year of Construction: 2009-2010

Declaration of Conformity: Metra Access Control and ELS products have been developed, designed and manufactured in accordance with the EU directive for Electromagnetic Compatibility (2004/108/EC).

Product description

Network Controller TCP/IP is a protocol converter/link between a Metra NET Network (CAN) and a computer LAN network (TCP/IP). It enables communication between Metra NET devices and Metra NET software installed on the personal computer in the same LAN network.

Network Controller TCP/IP controls up to 100 devices connected to Metra NET Network. If more than 100 devices are used in a system several separate Metra NET networks are controlled by Network Controllers NET which are mutually connected over LAN network. There are two available operating modes: single (master) and dual (master/slave). In single mode only one Metra Network Controller TCP/IP is used for each Metra NET network. The other possibility is to use the dual mode, where two Network Controllers TCP/IP control one Metra NET network. One Network Controller TCP/IP acts as master and the other is redundant slave that takes over the control of Metra NET network in case of master malfunction, etc. Master device is connected to one end of Metra Net Network and slave
device to the other. In normal operation only master device controls all devices on the Metra NET Network and slave serves as hot spare and is activated in case of LAN, Metra NET or master device failure and upon failure activation alarm notification is send by Metra PC SW over LAN/WAN network. If Metra NET Network gets interrupted both devices become master and take control of devices connected to their segment of Metra NET Network. A pushbutton which enables emergency opening of Metra ELS, ELS NET and LCC NET lockers connected to same Metra NET Network can be connected to the Network Controller TCP/IP.

- Basic parts

- Network Controller TCP/IP

- Power supply: 12 V / 0.8 A

  Input: 100 – 240 VAC / 12 W / 50 – 60 Hz
  Input connector: EU standard 230 VAC connector
  Output: 12 VDC / 0.85 A
  Output cable length: 1.5 m
  Output connectors: Phoenix MSTB 2,5/ 2-ST-5,08 (1757035)
  Temperature operating range: 0 °C up to +70 °C

- Emergency Open Push-button (optional)

  Key protected Emergency Open Push-button is used to initiate Emergency Open procedure for all Electronic Locks connected to Metra NET network.

- Network Controller / Repeater Mounting Plate for 19” rack (optional)

  Mounting plate for 19” computer rack for 2x “Network Repeater 2”, 1x “Network Repeater 8” and 1x Network Controller NET or Network Controller TCP/IP. With nine additional RJ-45 Metra NET Network connectors.
### Connections

<table>
<thead>
<tr>
<th>#</th>
<th>description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>12VDC Power*</td>
</tr>
<tr>
<td>2</td>
<td>Metra NET Network**</td>
</tr>
<tr>
<td>3</td>
<td>Emergency open pushbutton</td>
</tr>
<tr>
<td>4</td>
<td>Computer LAN network</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>#</th>
<th>description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>USB (disabled)***</td>
</tr>
<tr>
<td>6</td>
<td>RS232 serial channel (disabled)***</td>
</tr>
<tr>
<td>7</td>
<td>Metra NET Network** and Emergency open pushbutton</td>
</tr>
<tr>
<td>8</td>
<td>12VDC Power*</td>
</tr>
</tbody>
</table>

*NOTE:* 12V DC Power connectors 1 and 8 are internally parallel connected.

**NOTE:** Metra NET Network connectors 2 and 7 are internally parallel connected.

***NOTE:** By default Network Controller TCP/IP is set to operate over LAN network. Direct connection to computer via RS232 serial port or USB port is also possible, contact Metra technical support for more information.

### Power connection

Use the connector which suits your Network Controller placement best.

**RECOMENDATION:** Use connector 8 if Network Controller is mounted into “Network Controller / Splitter Mounting Plate for 19” rack”.

Connect the power supply cable to designated connector.
• LAN connection

By default Network Controller TCP/IP is set to operate over LAN network. Direct connection to personal computer or server via RS232 serial port is also possible, contact Metra technical support for more information.

Connect the LAN UTP cable to designated connector.

• Metra NET Network connection

Use the connector which suits your Metra NET Network installation best.  
**RECOMMENDATION:** For more reliable connection use UTP cable and connector.  

Connect the Metra NET Network (UTP or twisted pair) cable to designated connector.  

**NOTE**
See also “Emergency open push-button connection (option 2)”.

• Operating indicator

When the unit is running, front and rear blue LEDs are ON.
### Signalization lights

<table>
<thead>
<tr>
<th>#</th>
<th>colour</th>
<th>description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Blue</td>
<td>Power</td>
</tr>
<tr>
<td>2</td>
<td>Blue</td>
<td>Bluetooth activity (optional)</td>
</tr>
<tr>
<td>3</td>
<td>White</td>
<td>LAN</td>
</tr>
<tr>
<td>4</td>
<td>Amber/Green</td>
<td>Link (10 Mbps/100 Mbps)</td>
</tr>
<tr>
<td>5</td>
<td>Amber/Green</td>
<td>Activity (Half-Duplex/Full-Duplex)</td>
</tr>
<tr>
<td>6</td>
<td>Blue</td>
<td>Bluetooth activity (optional)</td>
</tr>
<tr>
<td>7</td>
<td>White</td>
<td>LAN</td>
</tr>
<tr>
<td>8</td>
<td>Green</td>
<td>Metra NET Network</td>
</tr>
<tr>
<td>9</td>
<td>Blue</td>
<td>Power</td>
</tr>
</tbody>
</table>
### Metra NET Network schematics

Next two chapters describe simple single and simple dual operating mode. For more Metra NET topology examples see “Metra NET Network – Installation Manual”.

**NOTE**
For single vs. dual mode comparison see appendices 1 - 4.

- **Single operating mode**

  In single mode only one Metra Network Controller TCP/IP is used for each Metra NET network.

- **Dual operating mode**

  In dual mode two Network Controllers TCP/IP control one Metra NET network. One Network Controller TCP/IP acts as master and the other is redundant slave that takes over the control of Metra NET network in case of master malfunction, etc. Master device is connected to one end of Metra Net Network and slave device to the other. In normal operation only master device controls all devices on the Metra NET Network and slave serves as hot spare and is activated in case of LAN, Metra NET or master device failure and upon failure activation alarm notification is send by Metra PC SW over LAN/WAN network. If Metra NET Network gets interrupted both devices become master and take control of devices connected to their segment of Metra NET Network.
• Emergency Open

• Emergency open push-button connection (option 1)

If you are using twisted pair cable or UTP cable without RJ-45 connector, connect emergency open pushbutton as shown on the picture. For emergency open use blue and blue/white wires of the UTP cable.

• Emergency open push-button connection (option 2)

With the UTP cable connect the connectors marked with Metra M logo on the device and “IN” on the Emergency open push button. Connect one end of Metra NET Network (UTP cable) to the connector marked “OUT” on the Emergency open push button as shown on the picture below.
IN (orange arrow): Connection cable from Network Controller.

OUT (green arrow): To Metra NET (CAN) Network.

• Initiating emergency open procedure

Turn the key on emergency open push-button clockwise to initiate emergency opening of all Lockers. Lockers will start to unlock and open one by one.

• Mounting into rack

NOTE
One Network Controller TCP/IP with two additional Network Repeaters 2 and one additional Network Repeater 8 can be simultaneously mounted to the Network Controller / Repeater Mounting Plate for 19” rack.
• Technical data

Operating voltage: 12V DC regulated (11.5 – 15V DC tolerated)
Current consumption: 0.75 A
Operating temperature range: 0°C up to +50°C
Visual LED signalization: 2 x Power, 4 x LAN, Metra NET Network, Bluetooth (optional)
Time: Real Time Clock
Storage: Non volatile memory buffer to store
Dimensions in mm (w/h/l): 218 / 34 / 66.5
Metra NET (CAN): Optically Isolated CAN controller. 1000 V isolation voltage
Connectors: 2 x Power, 2 x Metra NET Network, RS-232 serial channel, LAN network, USB, Push-button input (Emergency opening of Lockers)

• Metra NET RJ-45 connector pin out details

<table>
<thead>
<tr>
<th>pin</th>
<th>description</th>
<th>UTP cable wire colour</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>orange/white</td>
<td>Metra NET (CAN_H)</td>
</tr>
<tr>
<td>2</td>
<td>orange</td>
<td>Metra NET (CAN_L)</td>
</tr>
<tr>
<td>3</td>
<td>green/white</td>
<td>Metra NET (CAN_H)</td>
</tr>
<tr>
<td>4</td>
<td>blue</td>
<td>Emergency open push-button</td>
</tr>
<tr>
<td>5</td>
<td>blue/white</td>
<td>Emergency open push-button</td>
</tr>
<tr>
<td>6</td>
<td>green</td>
<td>Metra NET (CAN_L)</td>
</tr>
<tr>
<td>7</td>
<td>brown/white</td>
<td>Metra NET (CAN_H)</td>
</tr>
<tr>
<td>8</td>
<td>brown</td>
<td>Metra NET (CAN_L)</td>
</tr>
</tbody>
</table>

• Compatibility

Network Controller TCP/IP can be used as a replacement for Network Controller.

NOTE
By default Network Controller TCP/IP is set to operate over LAN network. Direct connection to computer via RS232 serial port is also possible, contact Metra technical support for more information.
If Network Controller TCP/IP is not already set to operate via RS232 serial port, the procedure should be performed by certificated technician.

Replacement procedure:

- Disconnect old Network Controller.
- To a new Network Controller TCP/IP connect power, Metra NET Network, RS-232 serial cable and emergency open pushbutton (if used) as described in previous chapters.
- Restart “LCC Network Controller” service (SW 6.7.4 or earlier) or “Metra Controller NET” service. (SW 6.7.5 or newer).

Appendix

1. **Operation schematics - Normal operation**
   - Single mode
   - Dual mode

2. **Operation schematics - Device malfunction or device power loss**
   - Single mode
   - Dual mode

3. **Operation schematics - Metra NET Network interruption**
   - Single mode
   - Dual mode

4. **Operation schematics - Computer LAN network interruption**
   - Single mode
   - Dual mode
Operation schematics - Normal operation

Single mode

Dual mode
Appendix 2

Operation schematics - Device malfunction or device power loss

Single mode

Dual mode
Operation schematics - Metra NET Network interruption

**Single mode**

**Dual mode**
Operation schematics - Computer LAN network interruption

Single mode

Dual mode