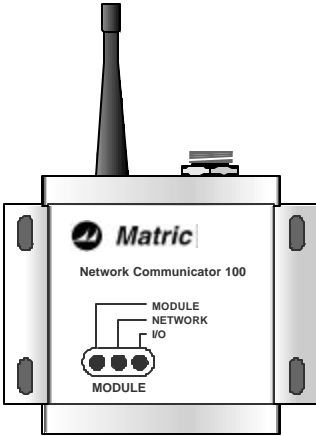




Network Communicator NC100

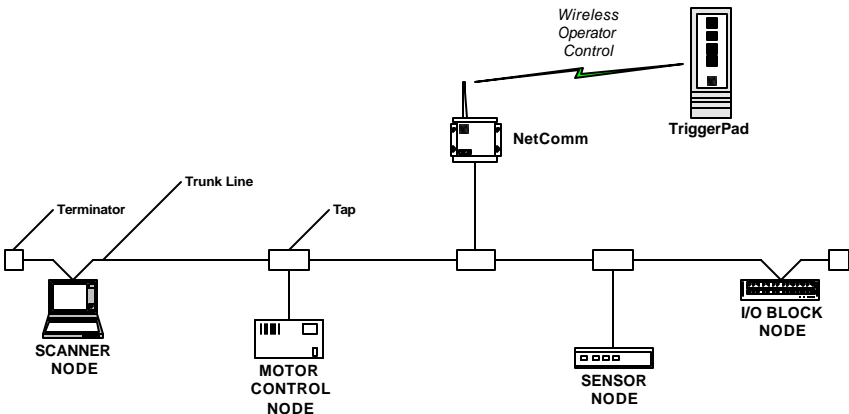
DESCRIPTION:



Add the convenience of wireless operator control to your DeviceNet* system using a NetComm 100 base unit.

The NetComm 100 brings the flexibility and productivity of ergonomic remote control to complex DeviceNet* processes.

The NetComm 100 is a base radio that receives operator commands from a wireless handheld transmitter and makes them available as a DeviceNet* object. Using the NetComm 100 and a TriggerPad handheld, an operator can interact with a DeviceNet* system at a typical separation of 300 feet. This product is ideal for interactive systems, system maintenance, and automated processes that require occasional manual override.



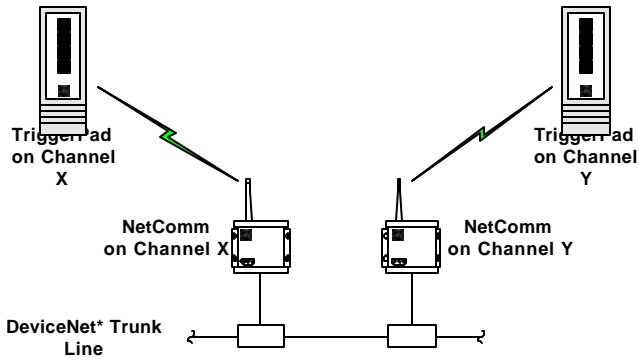
SPECIFICATIONS:

- Standard DeviceNet* node
- Configuration using DeviceNet*
- Rugged aluminum enclosure
- Panel mount flange
- Supports a variety of Matric handstations
- 16 bit CPU with CPU watchdog
- Baud rate (125K, 250K, 500K)
- Powered by 11-24VDC +/- 5% (DeviceNet)
- Power consumption .66A at 11VDC worst case
- In range / Out of range indicator for site mapping
- Power indicator
- Network status indicator
- 900MHz one way radio with 8 channels
- Fragmented Explicit Messaging supported
- Operational range of 0 - 300 feet*
- Remote antenna mount up to 30 feet
- Size: 5 1/4 X 5 3/4 X 3 Inches
- Weight: 1 Lb 10 Oz
- Five pin male mini connector
- Operational temperature 0°C to 70°C
- Storage temperature -40°C to 85°C
- DeviceNet Product Catalog Number 941

*Typical specified range, actual range is dependent upon conditions and transmitter specs

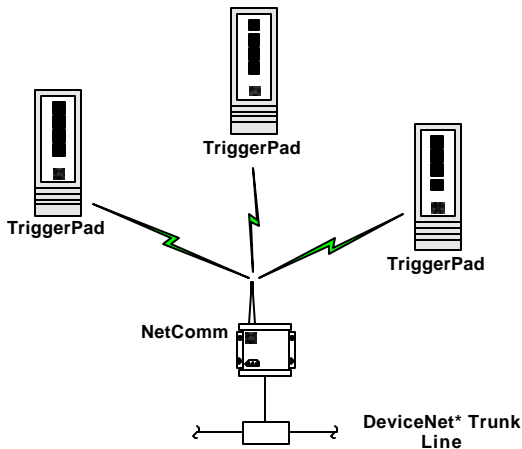
APPLICATION:

The Network Communicator employs 900 MHz radios that support 8 channels so that multiple independent systems can be implemented in relatively close proximity with one another as shown below. Refer to the "Placement" section of this manual for further details regarding RF proximity issues.



Multi-Channel Multi-Operator Application

The NetComm 100 supports an open RF messaging scheme that simply responds to messages that provide the required header and CRC. RF messages that are received simultaneously cannot be interpreted and are ignored. This approach provides a high degree of data integrity and flexibility, but does not guarantee message reception or discriminate between the sources of received messages. Consequently, the NetComm 100 is suitable for multi-operator applications, but does not provide the continuously maintained RF link required for emergency stop applications.



Single Channel Multi-Operator Application

A risk assessment should be performed before implementing any new control application. During risk assessments it should be noted that in applications that require emergency stop a different model of remote control or a different emergency stop method (pull cord, light curtain, etc.) should be employed. Matric offers a full line of remote control systems including models supporting emergency stop and operator enable capability.

A variety of handhelds are available for the NetComm 100. The TriggerPad 100 includes four durable mechanical switches, which provide tactile feedback and over 1 million cycle operational life. The TriggerPad 105 features eight membrane switches and a two digit LED display. The TP-105 display can be used to set a value that is transmitted to the NetComm. The value is simply an additional byte of data along with the switch states that is available at the NetComm for use by the DeviceNet* scanner for application programming. Uses include setting a speed value, a count, or identifying what equipment the handheld can control. TriggerPad handhelds are made of rugged molded plastic, use durable switches (over 1 million cycles), and typically provide more than one month of battery life using standard AA batteries.

The NetComm 100 is housed in a sealed aluminum extrusion with flanges for panel mounting. The sealed enclosure allows the NetComm to be mounted in a control case or externally where it may be exposed to weather.

The actual range available at any given site is dependent upon a number of RF related variables. Structural components such as steel decking, earth tunnels, antenna placement, and metal walls or equipment can effect the quality of RF transmissions. Also, radiation sources such as other radio systems, high power switching, and magnetic fields can also effect the quality of RF transmissions. A site assessment should be performed at any site where any new RF control is to be installed. Refer to the "Placement" section for details regarding radio issues, site assessment, and optimal antenna placement.

CONFIGURATION:

All configuration of the Network Communicator is performed via DeviceNet*, typically using a configuration device and explicit messages. The definitions of the objects supported by the NC100 are shown below. Once configured, the data specified in the Vendor Specific Object is available from the NC100 during a poll command-response sequence.

Default MAC ID: 63, software selectable

Identity Object (0x01):

Object Class:
Attributes: None Supported
Services: None Supported

Object Instance:
Attributes:

ID	Description	Get	Set	Value Limits
1	Vendor	X		229
2	Device Type			0
3	Product Code	X		941
4	Revision	X		
5	Status (bits supported)	X		
6	Serial Number	X		
7	Product Name	X		NetComm 100

Services:

DeviceNet Services	Parameter Options
Reset	1
Get_Attribute_Single	

Message Router Object (0x02):

Object Class:
Attributes: None Supported
Services: None Supported

Object Instance:
Attributes: None Supported
Services: None Supported

DeviceNet Object (0x03):

Object Class:
Attributes:

ID	Description	Get	Set	Value Limits
1	Revision	X		

Services:

DeviceNet Services	Parameter Options
Get_Attribute_Single	

Object Instance:
Attributes:

ID	Description	Get	Set	Value Limits
1	MAC ID	X	X	
2	Baud Rate	X	X	
3	BOI	X		
4	Bus-off Counter	X	X	
5	Allocation Info	X		

Services:

DeviceNet Services	Parameter Options
Get_Attribute_Single	
Set_Attribute_Single	
Allocate M/S Connection Set	
Release M/S Connection Set	

Assembly Object (0x04):

Object Class:

Attributes: None Supported

Services: None Supported

Object Instance:

Instance Type: Static Input, Instance Id = 1

Attributes:

ID	Description	Get	Set	Value Limits
3	Data	X		

Services:

DeviceNet Services	Parameter Options
Get_Attribute_Single	

Connection Object (0x05):

Object Class:

Attributes: None Supported

Services: None Supported

Object Instance:

Predefined M/S Connections: Explicit Message

Attributes:

ID	Description	Get	Set	Value Limits
1	State	X		
2	Instance Type	X		
3	Transport Class Trigger	X		
4	Produced Connection ID	X		
5	Consumed Connection ID	X		
6	Initial Comm. Characteristics	X		
7	Produced Connection Size	X		
8	Consumed Connection Size	X		
9	Expected Packet Rate	X	X	
12	Watchdog Time-out Action	X	X	1,3
13	Produced Connection Path Length	X		
14	Produced Connection Path	X		
15	Consumed Connection Path Length	X		
16	Consumed Connection Path	X		

Services:

DeviceNet Services	Parameter Options
Reset	
Get_Attribute_Single	
Set_Attribute_Single	

Object Instance:

Predefined M/S Connections: Polled

Attributes:

ID	Description	Get	Set	Value Limits
1	State	X		
2	Instance Type	X		
3	Transport Class Trigger	X		
4	Produced Connection ID	X		
5	Consumed Connection ID	X		
6	Initial Comm. Characteristics	X		
7	Produced Connection Size	X		
8	Consumed Connection Size	X		
9	Expected Packet Rate	X	X	
12	Watchdog Time-out Action	X		
13	Produced Connection Path Length	X		
14	Produced Connection Path	X		
15	Consumed Connection Path Length	X		
16	Consumed Connection Path	X		

Services:

DeviceNet Services	Parameter Options
Reset	
Get_Attribute_Single	
Set_Attribute_Single	

Parameter Object (0x0F):

Object Class:

Attributes:

ID	Description	Get	Set	Value Limits
1	Max Instance	X		
2	Parameter Class Descriptor	X		
3	Configuration Assembly Instance	X		

Services:

DeviceNet Services	Parameter Options
Get_Attribute_Single	

Object Instance:

Attributes:

ID	Description	Get	Set	Value Limits
1	Parameter Value	X	X	
2	Link Path Size	X		
3	Link Path	X		
4	Descriptor	X		
5	Data Type	X		
6	Data Size	X		

Services:

DeviceNet Services	Parameter Options
Get_Attribute_Single	
Set_Attribute_Single	

INDICATORS:

The NC100 provides three diagnostic L.E.D. indicators. The L.E.D. are labeled "Module", "Network", and "I/O". The behavior of these indicators conforms to DeviceNet* and is described below. Refer to "The DeviceNet* Communication Model and Protocol" Chapter 8 for complete details regarding DeviceNet* states and indicators.

Module Indicator

In general, this indicator shows the status of the DP400 unit itself.

For This State:	The LED is:	To Indicate:
No Power	Off	There is no power applied to the device.
Device Operational	Green	The device is operating in a normal condition.
Device In Standby	Flashing Green	The device needs commissioning due to configuration missing, incomplete, or incorrect.
Minor Fault	Flashing Red	The device has a recoverable fault.
Unrecoverable Fault	Red	The device has an unrecoverable fault and may need to be replaced.
Device Self Testing	Flashing Red/Green	The device is in self test.

I/O Indicator

In general, this indicator shows the status of communication between the NC100 unit and the remote handheld.

For This State:	The LED is:	To Indicate:
I/O Inactive	Off	All inputs and outputs are inactive.
	Green	
	Flashing Green	
	Flashing Red	
	Red	
	Flashing Red/Green	

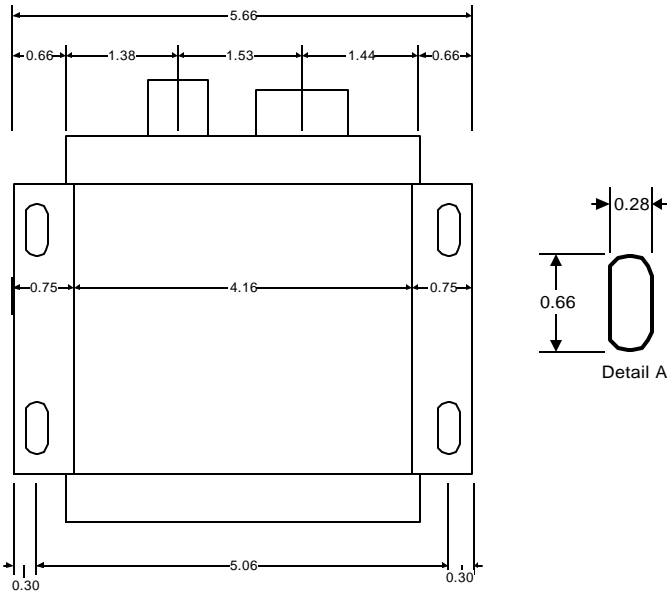
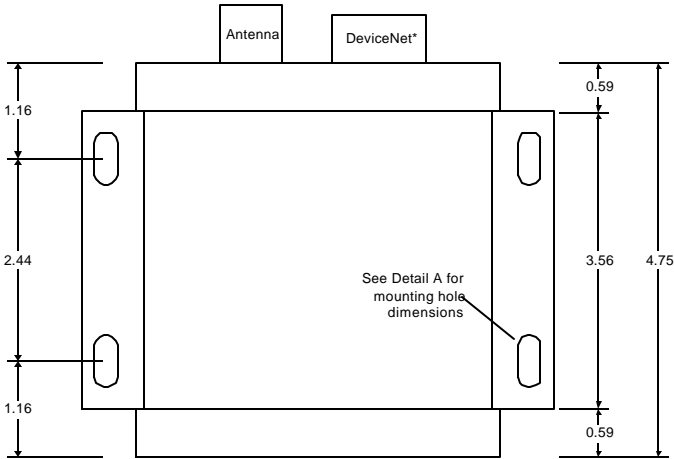
Network Indicator

In general, this indicator shows the status of the communication link between the DeviceNet* network and the NC100 unit.

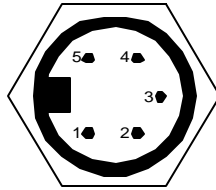
For This State:	The LED is:	To Indicate:
No Power/ Not Online	Off	There is no power applied to the device or the device has not yet completed power up testing.
Online, Not Connected	Flashing Green	The device is online, but has no connections to other nodes.
Link OK	Green	The device is online, and has connections to other nodes.
Connection Time Out	Flashing Red	One or more I/O connections have timed out.
Critical Link Failure	Red	The device has detected an error that has rendered it incapable of communicating on the network.
Communication Faulted	Flashing Red/Green	The device has detected a Network Access error and has received an Identify Communication Faulted Request – Long Protocol message.

INSTALLATION:

The NetComm 100 can be bolted directly to a control panel using the mounting flanges. See the diagram below for mounting dimensions.



The NetComm 100 provides a sealed mini style connector that complies with the physical standards for DeviceNet* connectors. A DeviceNet* tap is used to interface to the DeviceNet* trunk line. The pinout for the connector is shown below.



- 1 - Drain
- 2 - V+
- 3 - V-
- 4 - CAN_H
- 5 - CAN_L

PLACEMENT:

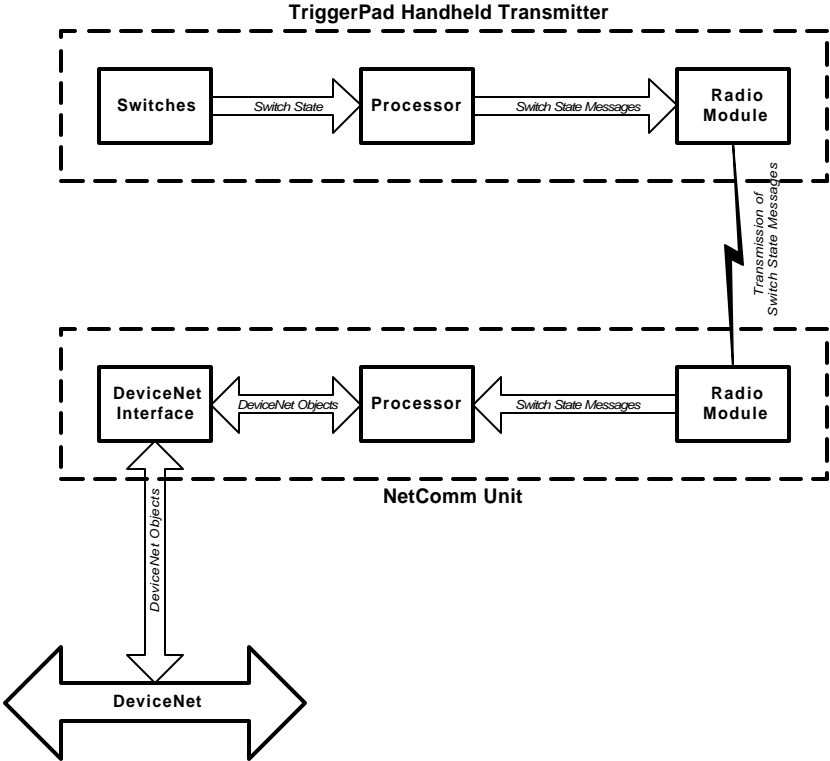
The NetComm 100 is an FSK radio receiver that operates in the 902-928 MHz band. Eight channels are provided for separation in adjacent applications. Multiple transmitters may be active on separate channels so long as an adjacent channel's signal does not enter the receiver at a level exceeding the rejection capability of the receiver. The effective rejection capability of the NetComm is dependent upon RF factors that vary from application to application. The rejection capability in a particular application may be determined through trial and error or through a comprehensive site assessment.

A site assessment should be performed before any new radio system is introduced into an operating environment. A thorough site assessment of an area will discover active radio frequencies that could lead to contention and their sources.

For optimal performance, the antenna for the NetComm should be mounted vertically, away from solid objects, and in the most visible line of sight from the normal transmitting area.

THEORY OF OPERATION

The Network Communicator involves three basic components. The first component is a Radio Module that receives switch state messages from a handheld transmitter. The Processor forms the switch data into DeviceNet Objects that are made available via a DeviceNet Interface.



APPROVALS:

The NetComm 100 has been tested and found to comply with the limits for an intentional radiating device, pursuant to Part 15 of the United States FCC Rules. Changes or modifications not expressly approved by Matric could void the user's authority to operate the NetComm 100.



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