

Ethernet/IP Network Interface Card

Customer Product Manual

Part 1054600_09

Issued 7/17



This document contains important safety information
Be sure to read and follow all safety information in this
document and any other related documentation.



NORDSON CORPORATION • DULUTH, GEORGIA • USA
www.nordson.com

Nordson Corporation welcomes requests for information, comments, and inquiries about its products. General information about Nordson can be found on the Internet using the following address: <http://www.nordson.com>.

Address all correspondence to:

Nordson Corporation
Attn: Customer Service
11475 Lakefield Drive
Duluth, GA 30097

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Ethernet/IP Network Interface Card

Safety

Read this section before using the equipment. This section contains recommendations and practices applicable to the safe installation, operation, and maintenance (hereafter referred to as “use”) of the product described in this document (hereafter referred to as “equipment”). Additional safety information, in the form of task-specific safety alert messages, appears as appropriate throughout this document.



WARNING! Failure to follow the safety messages, recommendations, and hazard avoidance procedures provided in this document can result in personal injury, including death, or damage to equipment or property.

Safety Alert Symbols

The following safety alert symbol and signal words are used throughout this document to alert the reader to personal safety hazards or to identify conditions that may result in damage to equipment or property. Comply with all safety information that follows the signal word.



WARNING! Indicates a potentially hazardous situation that, if not avoided, can result in serious personal injury, including death.



CAUTION! Indicates a potentially hazardous situation that, if not avoided, can result in minor or moderate personal injury.

CAUTION! (Used without the safety alert symbol) Indicates a potentially hazardous situation that, if not avoided, can result in damage to equipment or property.

Responsibilities of the Equipment Owner

Equipment owners are responsible for managing safety information, ensuring that all instructions and regulatory requirements for use of the equipment are met, and for qualifying all potential users.

Safety Information

- Research and evaluate safety information from all applicable sources, including the owner-specific safety policy, best industry practices, governing regulations, material manufacturer's product information, and this document.
- Make safety information available to equipment users in accordance with governing regulations. Contact the authority having jurisdiction for information.
- Maintain safety information, including the safety labels affixed to the equipment, in readable condition.

Instructions, Requirements, and Standards

- Ensure that the equipment is used in accordance with the information provided in this document, governing codes and regulations, and best industry practices.
- If applicable, receive approval from your facility's engineering or safety department, or other similar function within your organization, before installing or operating the equipment for the first time.
- Provide appropriate emergency and first aid equipment.
- Conduct safety inspections to ensure required practices are being followed.
- Re-evaluate safety practices and procedures whenever changes are made to the process or equipment.

User Qualifications

Equipment owners are responsible for ensuring that users:

- receive safety training appropriate to their job function as directed by governing regulations and best industry practices
- are familiar with the equipment owner's safety and accident prevention policies and procedures
- receive equipment and task-specific training from another qualified individual

NOTE: Nordson can provide equipment-specific installation, operation, and maintenance training. Contact your Nordson representative for information

- possess industry- and trade-specific skills and a level of experience appropriate to their job function
- are physically capable of performing their job function and are not under the influence of any substance that degrades their mental capacity or physical capabilities

Applicable Industry Safety Practices

The following safety practices apply to the use of the equipment in the manner described in this document. The information provided here is not meant to include all possible safety practices, but represents the best safety practices for equipment of similar hazard potential used in similar industries.

Intended Use of the Equipment

- Use the equipment only for the purposes described and within the limits specified in this document.
- Do not modify the equipment.
- Do not use incompatible materials or unapproved auxiliary devices. Contact your Nordson representative if you have any questions on material compatibility or the use of non-standard auxiliary devices.

Instructions and Safety Messages

- Read and follow the instructions provided in this document and other referenced documents.
- Familiarize yourself with the location and meaning of the safety warning labels and tags affixed to the equipment. Refer to *Safety Labels and Tags* at the end of this section.
- If you are unsure of how to use the equipment, contact your Nordson representative for assistance.

Installation Practices

- Install the equipment in accordance with the instructions provided in this document and in the documentation provided with auxiliary devices.
- Ensure that the equipment is rated for the environment in which it will be used. This equipment has not been certified for compliance with the ATEX directive nor as nonincendive and should not be installed in potentially explosive environments.
- Ensure that the processing characteristics of the material will not create a hazardous environment. Refer to the Safety Data Sheet (SDS) for the material.
- If the required installation configuration does not match the installation instructions, contact your Nordson representative for assistance.
- Position the equipment for safe operation. Observe the requirements for clearance between the equipment and other objects.
- Install lockable power disconnects to isolate the equipment and all independently powered auxiliary devices from their power sources.
- Properly ground all equipment. Contact your local building code enforcement agency for specific requirements.
- Ensure that fuses of the correct type and rating are installed in fused equipment.
- Contact the authority having jurisdiction to determine the requirement for installation permits or inspections.

Operating Practices

- Familiarize yourself with the location and operation of all safety devices and indicators.
- Confirm that the equipment, including all safety devices (guards, interlocks, etc.), is in good working order and that the required environmental conditions exist.
- Use the personal protective equipment (PPE) specified for each task. Refer to *Equipment Safety Information* or the material manufacturer's instructions and SDS for PPE requirements.
- Do not use equipment that is malfunctioning or shows signs of a potential malfunction.

Maintenance and Repair Practices

- Allow only personnel with appropriate training and experience to operate or service the equipment.
- Perform scheduled maintenance activities at the intervals described in this document.
- Relieve system hydraulic and pneumatic pressure before servicing the equipment.
- De-energize the equipment and all auxiliary devices before servicing the equipment.
- Use only new Nordson-authorized refurbished or replacement parts.
- Read and comply with the manufacturer's instructions and the SDS supplied with equipment cleaning compounds.

NOTE: SDSs for cleaning compounds that are sold by Nordson are available at www.nordson.com or by calling your Nordson representative.

- Confirm the correct operation of all safety devices before placing the equipment back into operation.
- Dispose of waste cleaning compounds and residual process materials according to governing regulations. Refer to the applicable SDS or contact the authority having jurisdiction for information.
- Keep equipment safety warning labels clean. Replace worn or damaged labels.

Equipment Safety Information

This equipment safety information is applicable to the following types of Nordson equipment:

- hot melt and cold adhesive application equipment and all related accessories
- pattern controllers, timers, detection and verification systems, and all other optional process control devices

Equipment Shutdown

To safely complete many of the procedures described in this document, the equipment must first be shut down. The level of shut down required varies by the type of equipment in use and the procedure being completed. If required, shut down instructions are specified at the start of the procedure. The levels of shut down are:

Relieving System Hydraulic Pressure

Completely relieve system hydraulic pressure before breaking any hydraulic connection or seal. Refer to the melter-specific product manual for instructions on relieving system hydraulic pressure.

De-energizing the System

Isolate the system (melter, hoses, applicators, and optional devices) from all power sources before accessing any unprotected high-voltage wiring or connection point.

1. Turn off the equipment and all auxiliary devices connected to the equipment (system).
2. To prevent the equipment from being accidentally energized, lock and tag the disconnect switch(es) or circuit breaker(s) that provide input electrical power to the equipment and optional devices.

NOTE: Government regulations and industry standards dictate specific requirements for the isolation of hazardous energy sources. Refer to the appropriate regulation or standard.

Disabling the Applicators

NOTE: Adhesive dispensing applicators are referred to as “guns” in some previous publications.

All electrical or mechanical devices that provide an activation signal to the applicators, applicator solenoid valve(s), or the melter pump must be disabled before work can be performed on or around an applicator that is connected to a pressurized system.

1. Turn off or disconnect the applicator triggering device (pattern controller, timer, PLC, etc.).
2. Disconnect the input signal wiring to the applicator solenoid valve(s).
3. Reduce the air pressure to the applicator solenoid valve(s) to zero; then relieve the residual air pressure between the regulator and the applicator.

General Safety Warnings and Cautions

Table 1 contains the general safety warnings and cautions that apply to Nordson hot melt and cold adhesive equipment. Review the table and carefully read all of the warnings or cautions that apply to the type of equipment described in this manual.




Equipment types are designated in Table 1 as follows:

HM = Hot melt (melters, hoses, applicators, etc.)

PC = Process control






CA = Cold adhesive (dispensing pumps, pressurized container, and applicators)


Table 1 General Safety Warnings and Cautions

Equipment Type	Warning or Caution
HM	 <p>WARNING! Hazardous vapors! Before processing any polyurethane reactive (PUR) hot melt or solvent-based material through a compatible Nordson melter, read and comply with the material's SDS. Ensure that the material's processing temperature and flashpoints will not be exceeded and that all requirements for safe handling, ventilation, first aid, and personal protective equipment are met. Failure to comply with SDS requirements can cause personal injury, including death.</p>
HM	 <p>WARNING! Reactive material! Never clean any aluminum component or flush Nordson equipment with halogenated hydrocarbon fluids. Nordson melters and applicators contain aluminum components that may react violently with halogenated hydrocarbons. The use of halogenated hydrocarbon compounds in Nordson equipment can cause personal injury, including death.</p>
HM, CA	 <p>WARNING! System pressurized! Relieve system hydraulic pressure before breaking any hydraulic connection or seal. Failure to relieve the system hydraulic pressure can result in the uncontrolled release of hot melt or cold adhesive, causing personal injury.</p>
Continued...	

General Safety Warnings and Cautions (contd)

Table 1 General Safety Warnings and Cautions (contd)

Equipment Type	Warning or Caution
HM	 <p>WARNING! Molten material! Wear eye or face protection, clothing that protects exposed skin, and heat-protective gloves when servicing equipment that contains molten hot melt. Even when solidified, hot melt can still cause burns. Failure to wear appropriate personal protective equipment can result in personal injury.</p>
HM, PC	 <p>WARNING! Equipment starts automatically! Remote triggering devices are used to control automatic hot melt applicators. Before working on or near an operating applicator, disable the applicator's triggering device and remove the air supply to the applicator's solenoid valve(s). Failure to disable the applicator's triggering device and remove the supply of air to the solenoid valve(s) can result in personal injury.</p>
HM, CA, PC	 <p>WARNING! Risk of electrocution! Even when switched off and electrically isolated at the disconnect switch or circuit breaker, the equipment may still be connected to energized auxiliary devices. De-energize and electrically isolate all auxiliary devices before servicing the equipment. Failure to properly isolate electrical power to auxiliary equipment before servicing the equipment can result in personal injury, including death.</p>
HM, CA, PC	 <p>WARNING! Risk of fire or explosion! Nordson adhesive equipment is not rated for use in explosive environments and has not been certified for the ATEX directive or as nonincendive. In addition, this equipment should not be used with solvent-based adhesives that can create an explosive atmosphere when processed. Refer to the SDS for the adhesive to determine its processing characteristics and limitations. The use of incompatible solvent-based adhesives or the improper processing of solvent-based adhesives can result in personal injury, including death.</p>
HM, CA, PC	 <p>WARNING! Allow only personnel with appropriate training and experience to operate or service the equipment. The use of untrained or inexperienced personnel to operate or service the equipment can result in injury, including death, to themselves and others and can damage to the equipment.</p>

Equipment Type	Warning or Caution
HM	 <p>CAUTION! Hot surfaces! Avoid contact with the hot metal surfaces of applicators, hoses, and certain components of the melter. If contact can not be avoided, wear heat-protective gloves and clothing when working around heated equipment. Failure to avoid contact with hot metal surfaces can result in personal injury.</p>
HM	<p>CAUTION! Some Nordson melters are specifically designed to process polyurethane reactive (PUR) hot melt. Attempting to process PUR in equipment not specifically designed for this purpose can damage the equipment and cause premature reaction of the hot melt. If you are unsure of the equipment's ability to process PUR, contact your Nordson representative for assistance.</p>
HM, CA	<p>CAUTION! Before using any cleaning or flushing compound on or in the equipment, read and comply with the manufacturer's instructions and the SDS supplied with the compound. Some cleaning compounds can react unpredictably with hot melt or cold adhesive, resulting in damage to the equipment.</p>
HM	<p>CAUTION! Nordson hot melt equipment is factory tested with Nordson Type R fluid that contains polyester adipate plasticizer. Certain hot melt materials can react with Type R fluid and form a solid gum that can clog the equipment. Before using the equipment, confirm that the hot melt is compatible with Type R fluid.</p>

Other Safety Precautions

- Do not use an open flame to heat hot melt system components.
- Check high pressure hoses daily for signs of excessive wear, damage, or leaks.
- Never point a dispensing handgun at yourself or others.
- Suspend dispensing handguns by their proper suspension point.

First Aid

If molten hot melt comes in contact with your skin:

1. Do NOT attempt to remove the molten hot melt from your skin.
2. Immediately soak the affected area in clean, cold water until the hot melt has cooled.
3. Do NOT attempt to remove the solidified hot melt from your skin.
4. In case of severe burns, treat for shock.
5. Seek expert medical attention immediately. Give the SDS for the hot melt to the medical personnel providing treatment.

Safety Labels and Tags

Refer to the melter product manual for the location of the product safety labels and tags affixed to the equipment.

Description

See Figure 1.

The Ethernet/IP network card is used in network systems to centrally collect and process data. The cards operate through the master-slave access method. When used in a network system, Nordson melters always operate as slaves.

Although most melter functionality can be set/monitored using network communications, some functionality is considered inconsistent with network usage and is therefore not accessible. Non-supported melter functions are:

- Clock
- Password protection
- PID selection (DuraBlue melters only)
- pump-off delay (DuraBlue melters only)
- Hose 1 and 2 solenoid activation (DuraBlue melters only)



Figure 1 Ethernet/IP card

Intended Use

This manual is intended for use by experienced PLC engineers.

The Ethernet/IP network card is intended to be used only as described in this manual. Any other use is considered to be unintended. Nordson is not liable for personal injury or property damage resulting from unintended use. Intended use includes the observance of Nordson safety regulations.

Supporting Documentation

The following documentation should be used in conjunction with this manual:

Title	Publisher	Location
Communication Data List	N/A	End of this manual
Melter Product Manual	Nordson	Shipped with melter
Drum Unloader Product Manual	Nordson	Shipped with Drum Unloader
Open Modbus/TCP Specification	Schneider Automation	www.modbus.org
RFC-821	Network Working Group	N/A
RFC-1918	Network Working Group	N/A
ENIP Specifications	Control/Net International and ODVA	www.odva.org

Interface Characteristics

- RJ45
- Data:
 - Status information
 - Alarms and faults
 - Actual values
 - Setpoint values
 - Limit parameters
- Integrated FTP server
- Telnet using standard MS DOS-type command line interface
- Web Server can serve web pages for a user friendly interface as well as remote troubleshooting (web pages provided by Nordson Corporation)
 - To view web pages go to http://<melter_IP_address>
 - To view web pages from outside your company's firewall, special arrangements may be needed for access to your melter. Consult your IT department.
- DNS support
- e-mail client
- Security framework

RJ45 (Standard) Connection

Pin	Signal
1	TD+
2	TD-
3	RD+
4	Termination
5	Termination
6	RD-
7	Termination
8	Termination

Ethernet Service Kit

KIT,CIRCUIT BOARD,ETHERNET CARD, P/N 1053289.

Ethernet/IP Card Installation

Install the Card

See Figures 2 and 3.

Install the Ethernet/IP card onto the melter CPU board observing the following guidelines. Route the Ethernet cable out of the electrical enclosure through one of the available conduit knockouts on the base or left side of the melter.

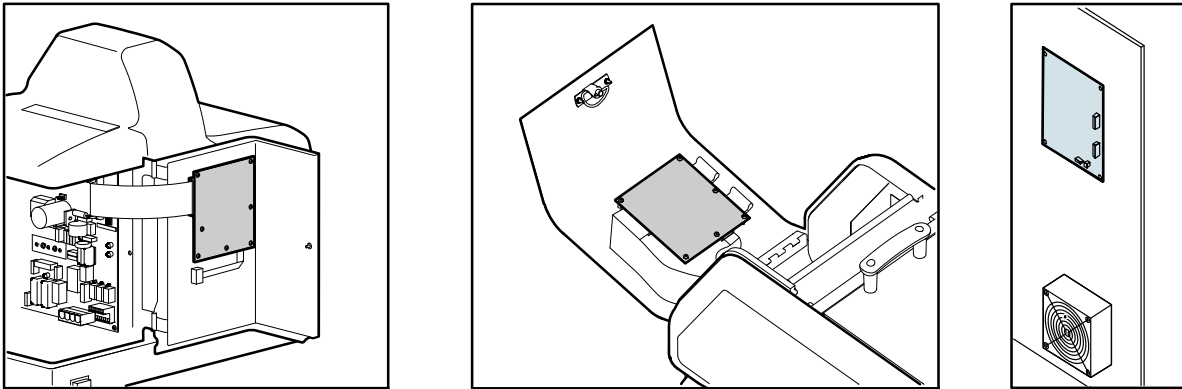


Figure 2 From left to right: Location of the CPU board on the ProBlue, DuraBlue, and DuraBlue 25/50/100

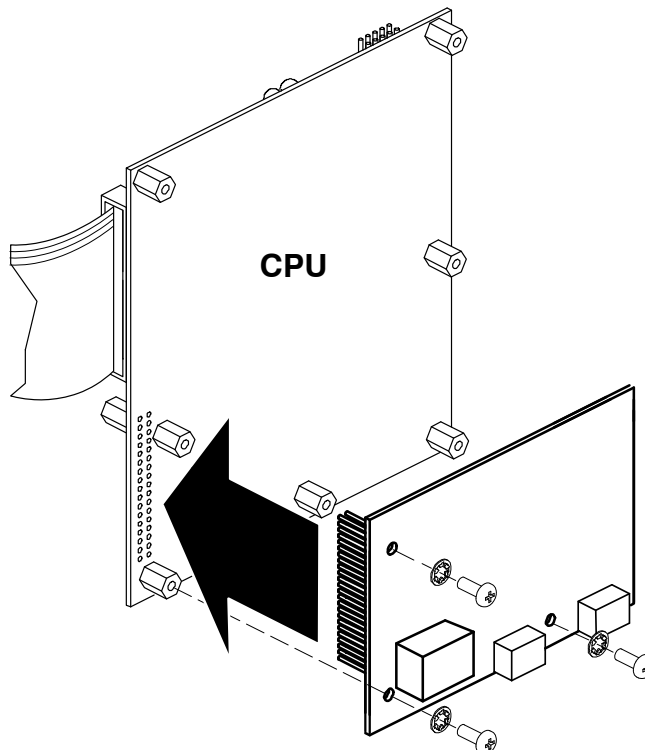


Figure 3 Attaching the Ethernet/IP card to the melter CPU

Check the Installation

Power on the melter and observe the red/green watchdog LED on the back of the Ethernet/IP card. See Table 2 and Figure 4.

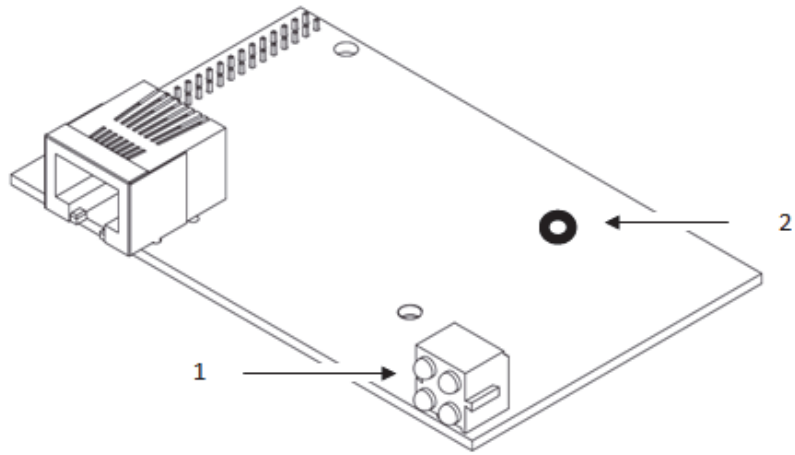


Figure 4 Typical LED Locations

1. Status indicators

2. Watchdog LED

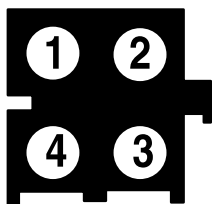
Watchdog LED

Table 2 Watchdog LED Indications

Indication	LED Color	Frequency
ASIC and FLASH ROM check fault	Red	2 Hz
Module not initiated	Green	2 Hz
Module initialized and running OK	Green	1 Hz
RAM check fault	Red	1 Hz
DPRAM check fault	Red	4 Hz

Status Indicators

LEDs 1–4 indicate run time status and errors to the user. During power up, a LED test sequence is performed according to the EtherNet/IP specification.



Status indicators

LED 1 - Link (Activity)

Color	State	Indicates
Green	On	The module has a link
	Off	The module does not sense a link

LED 2 - Link (Module Status)

State	Summary	Description
Steady Off	No power	No power applied to the module
Steady Green	Device operational	The module is operating correctly
Flashing Green	Standby	The module has not been configured
Flashing Red	Minor fault	A minor recoverable fault has been detected
Steady Red	Major fault	A major internal error has been detected
Flashing Green/Red	Self-test	The module is performing a power on self-test

LED 3 - Link (Network Status)

State	Summary	Description
Steady Off	No power or no IP address	The module has no power or no IP address
Steady Green	Connected	The module has at least one established Ethernet/IP connection.
Flashing Green	No connection	There are no Ethernet/IP connections established to the module
Flashing Red	Connection timeout	One or more of the connections in which the module is the target has timed out. This state is only left if all timed out connections are re-established or if the module resets
Steady Red	Duplicate IP	The module detected that its IP address is already in use
Flashing Green/Red	Self-test	The module is performing a power self-test

LED 4 - Activity

The Activity LED flashes green each time a packet is received or transmitted.

Set the Network Device Addresses**IP Address**

The IP address is used to identify each node on the TCP/IP network. Therefore, each node on the network must have a unique IP address. IP addresses are written as four decimal integers (0-255) separated by periods, where each integer represents the binary value of one byte in the IP address. This is called dotted-decimal notation.

Example:

Address 10000000 00001010 00000010 00011110 is written as 128.10.2.30

Subnet Mask

The IP address is divided into three parts - net ID, subnet ID and host ID. To separate the net ID and the subnet ID from the host ID, a subnet mask is used.

The subnet mask is a 32-bit binary pattern, where a set bit allocates a bit for network/subnet ID, and a cleared bit allocates a bit for the host ID. Like the IP address, the subnet mask is commonly written in dotted-decimal notation.

Example:

To make the IP address 128.10.2.30 belong to subnet 128.10.2, the subnet mask shall be set to 255.255.255.0.

Subnet Mask: 11111111 11111111 11111111 00000000 (255.255.255.0)

NOTE: To be able to establish communication between two devices both devices must belong to the same subnet. If not, the communication must be done through a gateway. It is therefore recommended to configure the module to the same subnet as your PC.

Special Case IP Addresses

Devices on an Ethernet network are not allowed to be configured to the following IP addresses; therefore do not configure the module to use any of them.

0.x.x.x - IP address where the first byte is zero

127.x.x.x - IP address where the first byte is 127

x.x.x.0 - IP address where the last byte is zero

x.x.x.255 - IP address where the last byte is 255

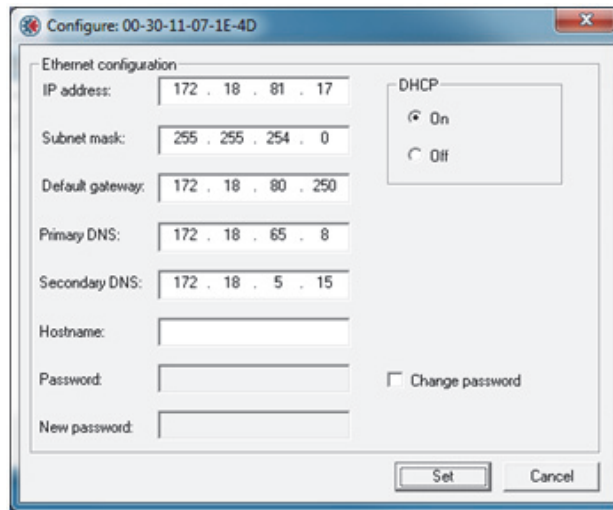
Configuring the IP Address

The module offers several ways to configure the IP address:

- Configuration Tool
- Configuration Switch
- DHCP/BootP
- Using a predefined IP address stored in the file `ethcfg.cfg'.
- Address Resolution Protocol (ARP)

Using the Configuration Tool

The module supports the HICP protocol used by the Anybus IPconfig utility, which was included with your download.



Upon starting the program, the network is scanned for Anybus products. The network can be rescanned at any time by clicking 'Scan'. To alter the network settings of the module, double click on its entry in the list. A window will appear, containing the settings for the module. Validate the new settings by clicking 'Set'. The new IP configuration will be stored in 'ethcfg.cfg'.

Optionally, the configuration can be protected from unauthorized access by a password. To enter a password, click on the 'Change password' checkbox, and enter the password under 'New password'. The password is stored in the system file 'ethcfg.cfg'.

Using the Configuration Switch

The configuration switch provides an easy way to configure the module for intranet use. The switch represents the binary value of the last byte in the IP address.

If the switch is set to a value between 1–255, the module will use the strings described below.

- IP address: 192.168.0.n
- Subnet mask: 255.255.255.0
- Gateway address: 0.0.0.0 (No gateway set)

The last byte (n) represents the binary value of the switches. Subnet mask and Gateway address settings are fixed to the above values when using the configuration switches.

Using the Configuration Switch (contd)

Example:

The switches are set to 00010100 (20 decimal)

The IP address of the module will be set to 192.168.0.20

NOTE: These settings can only be used on an intranet. This is because the IP address that is being set belongs to the private address set, refer to RFC 1918.

Using DHCP/BootP

If the configuration switch is set to 0, the module will use the configuration stored in the file 'ethcfg.cfg'.

If DHCP/BootP is enabled in the configuration file 'ethcfg.cfg' or if the configuration file is missing, the module will attempt to retrieve the following information via DHCP/BootP:

- IP address
- Subnet mask
- Gateway address
- SMTP server address
- Default Domain NameHost Name
- DNS server (Primary and secondary)

The retrieved information will be stored in the configuration file 'ethcfg.cfg'

NOTE: The module supports DHCP Reboot, i.e. it will ask the DHCP/BootP for the IP address stored in the configuration file. If the address is free to use, it will be assigned to the module. If not, the module will be assigned a new address.

Using a Predefined Configuration

If the configuration switch is set to 0, the module will use the configuration stored in the file `ethcfg.cfg`.

If DHCP/BootP is disabled or a DHCP/BootP server cannot be found, the module will try to use the configuration stored in the file `ethcfg.cfg`. If this file is missing, the module will indicate an error on the Network Status LED. In this state, the module will only run the ARP protocol.

Using ARP

The IP address can be changed during run-time using the ARP command from a PC. The new IP address will be stored in the configuration file `ethcfg.cfg`.

Below is an example on how to change the IP address from a MS DOS window:

```
arp -s <IP address> <MAC address>
ping <IP address>
arp -d <IP address>
```

The arp -s command will store the IP and MAC addresses in the PC's ARP table. When the ping command is executed, the PC sends this information to the module using the MAC address. The module detects that it was addressed with the correct MAC address and adopts the IP address sent by the PC. (The arp -d command is optional, but it removes the static route from the PC ARP table). The new IP address will be stored in the configuration file `ethcfg.cfg`.

This method can be used to reconfigure modules that already have been configured, or even to reconfigure modules outside the host's subnet. The MAC address is printed on a label on the bottom side of the module.

NOTE: As the Arp command automatically configures the subnet mask to 255.255.255.0, the first three bytes of the IP address must be the same as for the PC executing the command.

Example:

PC - 10.10.12.67

Module - 10.10.12.x (Where x is a value between 1 and 254)

DNS Support

DNS is a service that translates host names into IP addresses. Because domain names are alphabetic, they're much easier to remember. Every time a host name is used, a DNS service must translate the name into the corresponding IP address.

If a DNS server doesn't know how to translate a particular domain name, it will ask another one until the corresponding IP address is found.

The DNS configuration is specified in the configuration file ``ethcfg.cfg'`.

Primary and Secondary DNS (DNS1 and DNS2)

It is possible to define two DNS servers in the module, a primary and a secondary. When a domain name should be translated, the module will ask the primary DNS server. If it for some reason fails to process the request, the module will retry using the secondary DNS.

Host / Domain Names Conventions

Before a request is sent to a DNS server, the module will process the host name as follows:

- If the hostname does not contain a dot, the module will automatically append the default domain
- If the hostname ends with a dot, that dot will automatically be removed.
- If the hostname contains a dot but isn't ending with one, the module will.
 - send a request to the DNS server for the hostname
 - if that request fails, append the default domain name and try again

Example:

In the examples below, the default domain name is ``hms.com'`

- ``test'` becomes ``test.hms.com'`
- ``test.hms.com.'` becomes ``test.hms.com'`
- ``test.a'` will if not found become ``test.a.hms.com'`

Obtain the Device Master File

Nordson Corporation provides a device master (.EDS) for the technical description of the Ethernet/IP card described in this manual. The format is based on the standard EN 50170. The .EDS file may be downloaded from www.enordson.com/support.

Configure Files

The module uses these files for configuration purposes. The configuration files are ASCII files and can be edited with any text editor. Depending on security settings, the files may be inaccessible for normal users. Generally, the module has to be restarted in order for any changes in these files to have effect.

NOTE: It is very important to follow the exact syntax specifications for each configuration file, otherwise the module might have problems interpreting it, which can result in a faulty or non-expected behavior.

``ethcfg.cfg'`

This file contains the network configuration and is read by the module at start up. The settings in this file may be affected by several mailbox- and SSI commands. For more information about network configuration refer to *Configuring the IP Address*.

The format of the file is the following:

```
[IP address]
10.10.12.212

[Subnet mask]
255.255.255.0

[Gateway address]
0.0.0.0

[DHCP/BOOTP]
OFF

[Speed]
Auto

[Duplex]
Auto

[SMTP address]
0.0.0.0

[SMTP username]
username

[SMTP password]
password

[DNS1 address]
0.0.0.0

[DNS2 address]
0.0.0.0

[Domain name]
yourcompany.com

[Host name]
Nordson_Melter
```

The contents of this file can be redirected by placing the line ``[File path]'` on the first row, and a file path on the second.

Example:

```
[File path]
\user\eth_settings.cfg
```

In this example, the settings described above will be loaded from the file ``user\eth_settings.cfg'`. This permits normal users to access the network configuration settings.

ip_accs.cfg

It is possible to configure which IP addresses and what protocols that are allowed to connect to the module. This information is stored in the file 'ip_accs.cfg'. The file contains one or several of the headers below.

[Web]
[FTP]
[Telnet]
[Modbus/TCP]
[All]

Under each header the allowed IP addresses are written. The wildcard '*' can be used to allow series of IP addresses. If a protocol header is not given, the system will use the configuration set below the header 'All'. If the 'All' header is not given, the protocol will not accept any connections.

Example:

[Web]
10.10.12.*
10.10.13.*
[FTP]
10.10.12.*
[Telnet]
10.10.12.*
[All]

The above example will allow all IP addresses beginning with 10.10.12 to access all protocols in the module. Addresses beginning with 10.10.13 will be able to access the web server, but not the FTP and Telnet servers. The Modbus/TCP server will accept connections from any IP address.

The contents of this file can be redirected by placing the line '[File path]' on the first row, and a file path on the second.

Example:

[File path]
\my_settings\ip_access_rights.cfg

In this example, the settings described above will be loaded from the file '\my_settings\ip_access_rights.cfg'.

Formatting the File System

If the module refuses to start up, this may be due to an error in the file system. The steps below can be used to format and restore the file system to its initial state.

1. Short jumper named **J2**.
2. Apply power to the module.
3. Wait for the watchdog led to turn red.
4. Disconnect the power.
5. Remove jumper.
6. Again, apply power to the module.
7. Wait approximately 1 minute as the module is formatting the file system.

The module should now be working properly, however all files and folders in the file system have been erased.

Data Security

The file system features two security levels; Admin and Normal. Security level is set at a per user basis.

- Admin Mode

Admin users has full access to the file system through FTP and Telnet. This enables the user to access areas of the file system, that is restricted or inaccessible in Normal mode.

The Admin user accounts are defined in the file ``ad_pswd.cfg'`.

- Normal Mode

This mode is recommended for normal operation, so that web pages and other settings are protected from FTP and Telnet access. The accounts for normal users are defined in the file ``sys_pswd.cfg'`.

Files within the file system can be protected from web access through username/password authorization. Refer to *Password Files*.

Password Files

ad_pswd.cfg and sys_pswd.cfg

User/password information for FTP and Telnet is stored in the files `sys_pswd.cfg' (Normal users) and `ad_pswd.cfg' (Admin users). These files must be placed in `user\pswd' and `pswd\` respectively. These directories are protected from web browser access.

The file format is the following:

```
User1:password1
User2:password2
...
User3:password3
```

Example:

User: Password

In this example, the username is `User', and the password is `Password'.

If no `:' is present, the password will be equal to the username.

Example:

Username

In this example, both username and password will be `Username'.

FTP Server

It is possible to upload/download files to/from the file system using a standard FTP client. Depending on security settings, different parts of the file system can be accessed by the user:

- Normal users
The root directory will be `user' unless the user has Admin access rights, see below.
- Admin users
The user will have unrestricted access to the file system, i.e. the root directory will be `\'.
- Global Admin Mode
Any username/password combination will be accepted. All users have unrestricted access to the file system, i.e. the root directory will be `\'.

For more information about the security framework in the module. Refer to *Data Security*.

Email Client

It is possible to send emails from the module. To send an email, the SMTP server address must be configured. Without a valid SMTP address the module will not be able to send any email messages.

Sending a predefined email on data event

It is possible to send predefined email messages, triggered by a value in the Communication Data List. It is possible to have up to 10 user defined, and 10 admin defined emails, triggered on different events. These shall be placed in the directories "\user\email\" for user configurable emails and "\email\" for non-user configurable emails. The files must be named 'email_1.cfg', 'email_2.cfg' ... 'email_10.cfg'.

The files shall have the following format:

```
[Register]
Area, Data Location, Type

[Register match]
Match Value, Mask, Match operand

[To]
Recipient(s)

[From]
Sender

[Subject]
Subject line

[Headers]
Extra Headers

[Message]
Message body
```

Parameter	Description
Area	Source area in Network card memory. Possible values are "IN" or "OUT" from master's viewpoint. Usually "IN" is used.
Data Location	Data location value in memory area for the indexed protocol, only the "Status" work (bytes 0 and 1) is relevant. For the full map, calculate the data location by the following formula: Data Location=(2xFull Map Word Offset) +16
Type	Source data type. Possible values are 'byte', 'word', and 'long'
Match Value	Value to compare with the source data. Shall be written in decimal or hexadecimal.
Mask	The module performs a logical 'and' on the source data and this Mask before the value is compared with the Match Value. The value shall be written in decimal or hexadecimal.
Match Operand	Specifies how the data shall be compared with the Match Value. Possible values: '<', '=', '>'
Recipient(s)	Destination email addresses, semi-colon separated
Sender	Sender email address
Subject line	Email subject (One line only)
Extra Headers	Optional. May be useful for advanced users when for example sending HTML emails etc.

The data is read in the Data List from the area and offset specified by the parameters Area, and Offset. The data size to read is specified by the Type parameter. The module performs a logical 'AND' between the read data and the parameter Mask. The result is compared with the parameter Match Value. How the data shall be compared is specified by the Match Operand.

NOTE: If the [Register] or [Register match] information is changed, a reset is required for changes to take effect. Other changes will take effect directly without a reset.

Sending a predefined email on data event (contd)

Example:

```
[Register]
IN, 0x0003, byte

[Register match]
0x20, 0x7F, >

[To]
support@field.com

[From]
myaddress@work.com

[Subject]
Status

[Message]
All data correct.
```

NOTE: Hexadecimal values must be written in the format 0xN where 'N' is the hexadecimal value.

Other Functionality

Melter Control Panel Lock-out

When password protection (melter parameters 10 and 11) are enabled with a network card installed, all operator panel controls are disabled.

Melter Operational Modes

Melters with a network card have two operational modes: local and remote. The default is the remote mode. The mode may be selected through the melter operator panel.

Local Mode

The local mode of operation is used mainly to view data for maintenance and repair purposes. In this mode, the melter operates like a melter that does not include a network card:

- Control access is only via the melter operator panel
- Parameter input is only via the melter operator panel
- Through the master, all parameters can be displayed but not changed. The master can always read actual values.

To place the melter in the local mode, change Parameter 14 (External Comm Lockout) to 1.

Remote Mode

When the melter is in the remote mode of operation, it can be operated from both the master and the melter operator panel:

- Setpoints and system parameters can be entered through the master or the melter operator panel.
- If control of the melter exclusively through the master is desired, you can enable password protection (melter operating parameters 10 and 11), which locks-out operation of the melter using the operator panel. Refer to the melter product manual for information on enabling password protection.

NOTE: When a network card is installed in the melter, enabling password protection will disable all melter operator panel input, including the Heaters, Pump, and Standby keys.

To place the melter in the remote mode, change Parameter 14 (External Comm Lockout) to 0. This is the default setting.

Indexed Data Interface

When data is transmitted from the Nordson melter to the master and vice versa, the data is accessed via indexes. The data available via the network are shown in the *Communication Data List*. The indexing method allows a smaller data packet which prevents the network from being loaded with unnecessary data.

Indexed Protocol Data Processing

- The master formulates a command by determining the transmission data packet. The Nordson melter processes the command and formulates the reply telegram.
- The master processes the data or repeats the command until a reply is received from the Nordson melter. Only one command is processed at a time. The Nordson melter keeps the reply available until the master formulates a new command.
- When a Command cannot be executed, the Nordson melter replies with a fault signal in the Status. The master recognizes by this identification whether the previously transmitted command was correctly processed by the Nordson melter.
- The master has to check that the acknowledge Data index and Channel number from the Nordson melter are the same as the data in the transmission data packet.

Transmit and Receive Packets

The master sends a transmission packet to the Nordson melter. This packet contains a command that the Nordson melter is to process.

The following illustration shows an example of the reading out of temperature actual values.

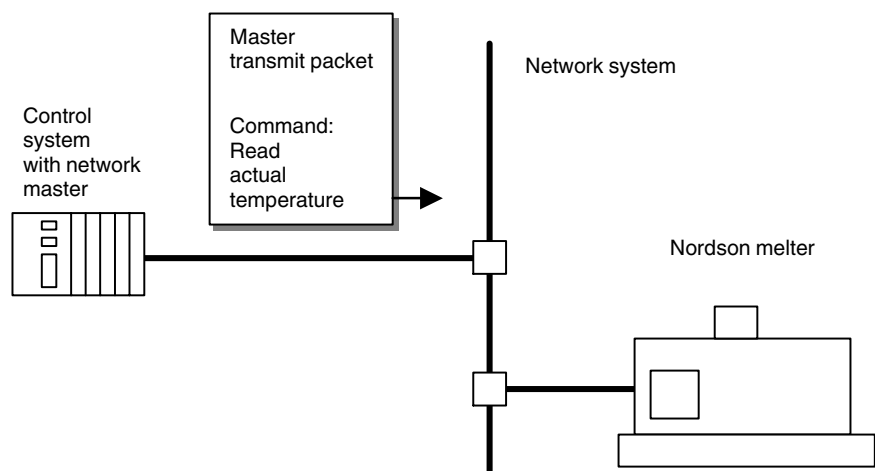


Figure 5 Example of master-to-melter communication

The Nordson melter replies to each packet from the master with status information on command processing. Requested data values are also returned in the reply packet.

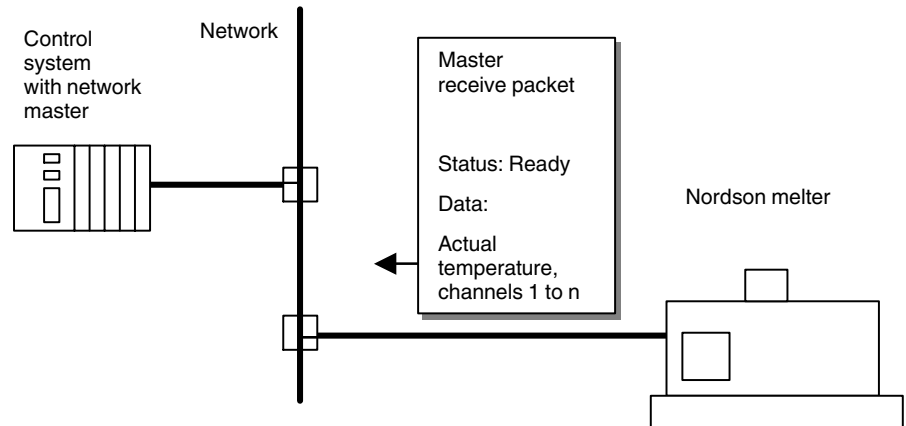


Figure 6 Example of melter-to-master communication

The master may not formulate and transmit a new command until after arrival of the receive packet.

Transmit packet Data

Table 3 lists the transmit packet data.

- Communication is done with two data packets: Receive and Transmit (from the master's viewpoint).
- The Receive and Transmit data packets are instances 100 and 150 respectively.
- The data packets always have the same length: 16 bytes, consistent.

Table 3 Transmit Packet Data

Byte Address N	Byte (B), Word (W)	Designation
N	B	Melter control
N + 1	B	Command
N + 2	B	Data index
N + 3	B	Channel number
N + 4	W	Write data value of channel number
N + 6	W	Motor 1 speed in % (if available)
N + 8	W	Motor 2 speed in % (if available)
N + 10	W	Motor 3 speed in % (if available)
N + 12	W	Motor 4 speed in % (if available)
N + 14	W	Not used
NOTE: The master may need to swap bytes in some or all of the packet data if the data formats of the master and the Nordson melter do not correspond.		

Melter Control

The melter control data in the transmit packet is executed by the Nordson melter with each packet, regardless of the command type.

NOTE: Unused or reserved bits must be set to 0 (zero).

Table 4 Melter Control Data

Bit	Value	Action	Note
0	1	Heaters ON	Heaters ON and temperature standby require a transition from 0 to 1 for activation.
	0	Heaters OFF	
1	1	All pumps ON	
	0	All pumps OFF	
2	1	Pump 1 ON	
	0	Pump 1 OFF	
3	1	Pump 2 ON (if available)	
	0	Pump 2 OFF (if available)	
4	1	Pump 3 ON (if available)	
	0	Pump 3 OFF (if available)	
5	1	Pump 4 ON (if available)	
	0	Pump 4 OFF (if available)	
6	1	Temperature standby ON	Heaters ON and temperature standby require a transition from 0 to 1 for activation.
	0	Temperature standby OFF	
7	1	Auto Motor On	Automatically turns motors on when unit has reached Ready
	0	Auto Motor OFF	

Command

The master must send a command to the Nordson melter. Each command is defined by a command identification.

Table 5 Command Identifications

Command	Function
1 _{dec}	No command for the Nordson melter
3 _{dec}	Master wants to read data from the Nordson melter
6 _{dec}	Master wants to write data to the Nordson melter

Any other command identification is not valid and will generate a communication fault in the status data packet.

If the command is 0 (zero), a “host communication failure” will be generated at the melter. This functionality operates for communication monitoring and master life guarding.

Data Index

The indexes in the *data index* packet correspond to those in the *Communication Data List* at the end of this section.

The range of data indexes is 0 to 255. A data index set to 0 (zero) is interpreted as “no *data index*.”

Channel Number

The master must select a channel number that is valid. Refer to *Channel Number List* later in this section for the channel number descriptions (such as for a temperature channel).

Beginning with the selected channel number as a start channel, the command for reading data is processed for the six successive channels.

Write Data Value

In the *write data value* data packet, the master writes the data values used to enter settings in the Nordson melter.

Example: Master sets the Ready Delay parameter to a value of 25 minutes.

Transmit packet Data	Channel Number	Value
Write data value of channel number	0	25 _{dec} (25min)

Receive Packet Data

Table 6 lists the receive packet data packets.

Table 6 Receive packet Data packets

Byte Address N	Byte (B), Word (W)	Designation
N	W	Status
N + 2	B	Acknowledge: Data index
N + 3	B	Acknowledge: Channel number
N + 4	W	Read data value of channel number
N + 6	W	Read data value of channel number + 1
N + 8	W	Read data value of channel number + 2
N + 10	W	Read data value of channel number + 3
N + 12	W	Read data value of channel number + 4
N + 14	W	Read data value of channel number + 5
NOTE: The master may need to swap bytes in some or all of the packet data if the data formats of the master and the Nordson melter do not correspond.		

Status

The status data in each receive packet communicates general information from the Nordson melter.

Table 7 Status Data

Bit	Value	Action
0	1	Ready for operation
	0	Not ready for operation
1	1	Pump Startup Protection On
	0	Pump Startup Protection Off
2	1	Alert
	0	No alert
3	1	Fault
	0	No fault
4	1	Shutdown
	0	No shutdown
5	1	Heat-up phase active
	0	Heat-up phase not active
6	1	Temperature standby on
	0	Temperature standby off
7	1	Pump 1 is running
	0	Pump 1 is not running
8	1	Pump 2 is running (if available)
	0	Pump 2 is not running (if available)
9	1	Pump 3 is running (if available)
	0	Pump 3 is not running (if available)
10	1	Pump 4 is running (if available)
	0	Pump 4 is not running (if available)
11	1	Not used
	0	Not used

Table 7 Status Data (contd)

Bit	Value	Action
12	-	Reserved
13	-	Reserved
14	1	Communication fault: <ul style="list-style-type: none"> • Wrong <i>command</i> received • Wrong <i>data index</i> received • Wrong <i>channel number</i> received
	0	No communication faults in packet header
15	1	Communication fault in data value: <ul style="list-style-type: none"> • Data values can not be changed. Example: Write command on actual values. • Data access not permitted. Example: Write command in the <i>Local mode</i> or <i>commands</i> for channels that are not installed. • At least one data value is invalid. The data packet received may not be evaluated by the master. Example: A value is outside of the permitted value range.
	0	No communication faults in data values

NOTE: Nordson melters are equipped with automatic Pump Startup Protection. The Pump Startup Protection prevents all stopped pumps (such as those stopped as a result of an RTD fault) from starting up automatically after finishing the heat-up phase or after a fault has occurred.

To acknowledge the Pump Startup Protection, change the All Pumps ON/OFF parameter from OFF to ON. (For a rising transition-based reset, refer to *Melter Control*. If bit1 = 0, then set to 1; if bit1 = 1, then set to 0 and subsequently to 1 again.)

Read Data Value

In the *read data value* area, the master reads the data received from the Nordson melter. The read data values of six successive channels are transmitted with each packet (where applicable).

Example: Master reads actual temperature values; channel number is set to 9.

Table 8 Read Data Values

Receive packet Data	Temperature Channel	Value
Read data value of channel number	9	150 _{dec} (150 °C)
Read data value of channel number + 1	10	151 _{dec} (151 °C)
Read data value of channel number + 2	11	160 _{dec} (160 °C)
Read data value of channel number + 3	12	165 _{dec} (165 °C)
Read data value of channel number + 4	13	172 _{dec} (172 °C)
Read data value of channel number + 5	14	180 _{dec} (180 °C)

NOTE: If the master sets the *command* or *data index* to 0 (zero) in the transmit packet, the *read data values* are set to 0 (zero) from the melter.

Example: Master sets *data index* to 0 (zero).

Transmit packet

Melter control	Command	Data Index	Channel Number	Write Data Value of Channel Number	1	2	3	4
		0		...				

Receive packet

Status	Acknowledge: Data index	Acknowledge: Channel Number	Read Data Value of Channel Number					
				+ 1	+ 2	+ 3	+ 4	+ 5
0001 _{hex}	0	...	0	0	0	0	0	0

NOTE: If the transmit packet is faulty, the *read data values* are set to 0 (zero) from the Nordson melter.

Example: Master sets *data index* to a fault value (999). The *status* of the Nordson melter is *ready for operation* and *communication fault: wrong data index*.

Transmit packet

Melter control	Command	Data Index	Channel Number	Write Data Value of Channel Number	1	2	3	4
		999		...				

Receive packet

Status	Acknowledge: Data index	Acknowledge: Channel Number	Read Data Value of Channel Number					
				+ 1	+ 2	+ 3	+ 4	+ 5
4001 _{hex}	999	...	0	0	0	0	0	0

NOTE: Invalid *read data* values are set to 0 (zero) by the Nordson melter.

Indexed Packet Examples

Example 1

Master action: enable melter (turn heaters on)

NOTE: In this example, the Nordson melter is operating and there are no faults.

Transmit packet

Melter control	Command	Data Index	Channel Number	Write Data Value of Channel Number	1	2	3	4
Bit 0 set to 1: 01 _{hex}		Does not matter						

Receive packet

Status	Acknowledge: Data index	Acknowledge: Channel Number	Read Data Value of Channel Number				
				+ 1	+ 2	+ 3	+ 4
001 _{hex}	Does not matter						

Example 2

Master action:

- Enable melter
- Set temperature setpoint of Hose 1 to 150°C

NOTE: In this example, the Nordson melter is operating and there are no faults.

Transmit packet

Melter control	Command	Data Index	Channel Number	Write Data Value of Channel Number	1	2	3	4
Bit 0 set to 1: 01 _{hex}	6 _{hex}	73 _{hex}	3 _{hex}	96 _{hex} (150 °C)	Does not matter			

Receive packet

Status	Acknowledge: Data index	Acknowledge: Channel Number	Read Data Value of Channel Number				
				+ 1	+ 2	+ 3	+ 4
0001 _{hex}	73 _{hex}	3 _{hex}	Does not matter				

Example 3

Master action:

- Enable melter
- All pumps ON
- Read actual value of temperature channels 3 and 4

Result: channel 3 = 175°C; channel 4 = 180°C

NOTE: In this example, the Nordson melter is operating and there are no faults.

Transmit packet

Melter control	Command	Data Index	Channel Number	Write Data Value of Channel Number	1	2	3	4
Bit 0 and bit 1 set to 1: 03 _{hex}	3 _{hex}	78 _{hex}	3 _{hex}	Does not matter	Does not matter			

Receive packet

Status	Acknowledge: Data index	Acknowledge: Channel Number	Read Data Value of Channel Number					
				+ 1	+ 2	+ 3	+ 4	+ 5
0001 _{hex}	78 _{hex}	3 _{hex}	AF _{hex} (175 °C)	B4 _{hex} (180 °C)	Does not matter			

Full Map Data Interface

The full map method allows access to all melter data in one packet. This method causes the packets to be much larger than that of the Indexed Protocol but requires less programming on the master side to create an interface.

Full Map Packet Processing

NOTE: Full map data packets are available only with melter firmware version 1.114 or higher.

- The master formulates a command by determining the transmission data packet. The Nordson melter processes the command and formulates the reply packets.
- The master processes the data or repeats the command until a reply is received from the Nordson melter. Only one command is processed at a time. The Nordson melter keeps the reply available until the master formulates a new command.
- When a Transmit data packet contains an error, the Nordson melter replies with a fault bit in the Status. The master recognizes by this signal whether the previously transmitted command was correctly processed by the Nordson melter.

Transmit and Receive Packets

The master sends a transmission packet to the Nordson melter. This packet contains information that the Nordson melter is to process.

The following illustration shows an example of the reading of the full map.

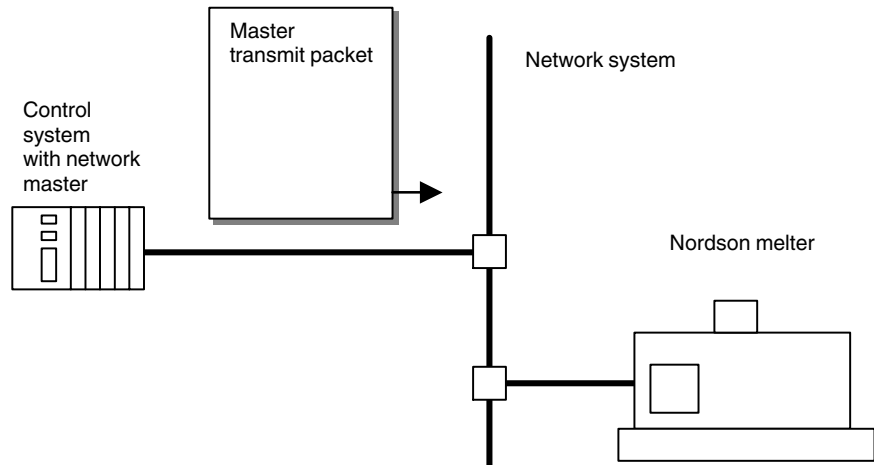


Figure 7 Example of master-to-melter communication

The Nordson melter replies to each packet from the master with status information on packet processing.

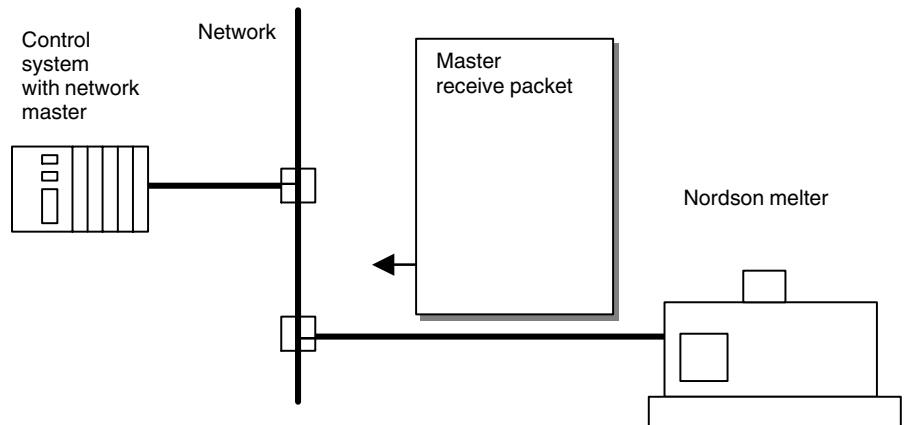


Figure 8 Example of melter-to-master communication

The master may not formulate and transmit a new packet until after arrival of the receive packet.

Full Map Packet Data

NOTE: Full map data packets are available only with melter firmware version 1.114 or higher.

- Communication is done with two data packets: Receive and Transmit (from the master's viewpoint).
- The Receive and Transmit data packets are instances 101 and 151 respectively.
- The data packets always have the same length: 248 words.
- The Melter Control byte is located at offset 0 of the Transmit instance
- The Status word is located at offset 0 of the Receive instance.
- All available melter data can be read and written (if writable) per the Communication Data List.

NOTE: The master may need to swap bytes in some or all of the packet data if the data formats of the master and the Nordson melter do not correspond.

Melter Control

The melter control data in the transmit packet is executed by the Nordson melter with each packet.

NOTE: Unused or reserved bits must be set to 0 (zero).

Table 9 Melter Control Data

Bit	Value	Action	Note
0	1	Heaters ON	Heaters ON and temperature standby require a transition from 0 to 1 for activation.
	0	Heaters OFF	
1	1	All pumps ON	
	0	All pumps OFF	
2	1	Pump 1 ON	
	0	Pump 1 OFF	
3	1	Pump 2 ON (if available)	
	0	Pump 2 OFF (if available)	
4	1	Pump 3 ON (if available)	
	0	Pump 3 OFF (if available)	
5	1	Pump 4 ON (if available)	
	0	Pump 4 OFF (if available)	
6	1	Temperature standby ON	Heaters ON and temperature standby require a transition from 0 to 1 for activation.
	0	Temperature standby OFF	
7	1	Auto Motor ON	Automatically turns motors on when unit has reached Ready
	0	Auto Motor OFF	

Status

The status data in each receive packet communicates general information from the Nordson melter.

Table 10 Status Data

Bit	Value	Action
0	1	Ready for operation
	0	Not ready for operation
1	1	Pump Startup Protection On
	0	Pump Startup Protection Off
2	1	Alert
	0	No alert
3	1	Fault
	0	No fault
4	1	Shutdown
	0	No shutdown
5	1	Heat-up phase active
	0	Heat-up phase not active
6	1	Temperature standby on
	0	Temperature standby off
7	1	Pump 1 is running
	0	Pump 1 is not running
8	1	Pump 2 is running (if available)
	0	Pump 2 is not running (if available)

Table 10 Status Data (contd)

Bit	Value	Action
9	1	Pump 3 is running (if available)
	0	Pump 3 is not running (if available)
10	1	Pump 4 is running (if available)
	0	Pump 4 is not running (if available)
11	1	Not used
	0	Not used
12	-	Reserved
13	-	Reserved
14	1	Communication fault: <ul style="list-style-type: none"> • Wrong <i>command</i> received • Wrong <i>data index</i> received • Wrong <i>channel number</i> received
	0	No communication faults in packet header
15	1	Communication fault in data value: <ul style="list-style-type: none"> • Data values can not be changed. Example: Write command on actual values. • Data access not permitted. Example: Write command in the <i>Local mode</i> or <i>commands</i> for channels that are not installed. • At least one data value is invalid. The data packet received may not be evaluated by the master. Example: A value is outside of the permitted value range.
	0	No communication faults in data values

NOTE: Nordson melters are equipped with automatic Pump Startup Protection. The Pump Startup Protection prevents all stopped pumps (such as those stopped as a result of an RTD fault) from starting up automatically after finishing the heat-up phase or after a fault has occurred.

To acknowledge the Pump Startup Protection, change the All Pumps ON/OFF parameter from OFF to ON. (For a rising transition-based reset, refer to *Melter Control*. If bit1 = 0, then set to 1; if bit1 = 1, then set to 0 and subsequently to 1 again.)

Master Procedures

These procedures apply to programming executed from the master.

Master: Determine Transmit Packet

1. Set *melter control*.
2. Change the data as desired.
3. Send the transmit packet to the Nordson melter.

Melter: Process a New Packet

1. Evaluate and execute *melter control*.
2. Set map data
3. Set *status*.
4. Provide the receive packet to the master.

Master: Evaluate the Receive Packet

1. Evaluate *status*.
2. Check acknowledge data.

Troubleshooting

If there is a problem communicating with your network card, please use these troubleshooting tips.

- First, look at the four status LEDs on the card. Do they give an indication of a problem? Most often, a problem indicated by the status LEDs is caused by a cabling problem or the PLC is not correctly configured to communicate to the card. Please see the table in the Status Indicators section of this manual for details.
- Next, verify that the address of the card is set correctly.
 - Use the IP Config Utility software to confirm your card's address. The software was included with your download.
 - If you used a PC to set your card's address, please verify that the dip switches on the card are all up. The dip switches override any addresses set by PC.
- Next, verify that the watchdog LED is blinking green once per second. If it is not:
 - Reboot the melter
 - Verify that the melter has the latest software for that model of melter. If the software is not the latest version, a software upgrade may be necessary. The latest version of software is available at
 - For ProBlue and Liberty
<http://emanuals.nordson.com/adhesives/software/BlueSeriesSoftware.html>
 - For AltaTouch
<http://emanuals.nordson.com/adhesives/software/AltaBlueTouchSoftware.html>
 - For Concert
<http://emanuals.nordson.com/adhesives/software/TruFlowSoftware.html>
- If the melter is displaying the F4/E error code but is otherwise communicating with the PLC, please verify that the PLC code is not writing an illegal value in the 'Command' byte in the index protocol. The only legal values in the Command byte are 1 (No Command), 3 (Read) and 6 (Write). Please see the Indexed Data Interface section of this manual for details.
- If none of the above steps solve the problem, please contact Nordson Technical Service at 1-877-NORDSVC or at HMTechnicalService@nordson.com

Channel Number List

Table 11 Channel Numbers

Number	Channel
1	Tank
2	Manifold/Pump
3	Hose 1
4	Gun 1
5	Hose 2
6	Gun 2
7	Hose 3
8	Gun 3
9	Hose 4
10	Gun 4
11	Hose 5
12	Gun 5
13	Hose 6
14	Gun 6
15	Hose 7
16	Gun 7
17	Hose 8
18	Gun 8

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Communication Data List

NOTE: The following Data Designations are supported for all Alta, Dura, and ProBlue series melters unless otherwise indicated.

General Melter Data

Data Designation	Quantity	Range Resolution	Default	Remarks	Indexed Protocol		Full Map Word Offset
					Data Index	Channel Number	
Melter control/status	1	0-FFFF	N/A	Read/Write	NA	NA	0
Software version	1	byte 1 - version byte 0- revision	N/A	Read only	3	0	2
Melter operation mode: - Local mode - Field bus mode	1	1 (Local mode) 0 (Field bus)	0 (Field bus)	Read/Write at the operator panel Read only via fieldbus	4	0	4
Hour Meter: Total hours with heaters on	1	0 - 99999h	N/A	Read only	5	0	5
Service Interval: Adjustable time frame to check a particular maintenance	1	0 - 8736 h (1 year)	500 h	Read/Write	6	0	6
Clear Fault/Warning NOTE: If the fault/warning condition has not been fixed, the fault/warning will reappear.	1	0/1	0 (no reset)	Read/Write	7	0	7
Ready delay value	1	0 - 60 min	0 min	Read/Write	9	0	9
Auto Pump On Off This allows the unit to automatically turn the piston pump on when the unit reaches setpoint.	1	0/1	1	Read/Write	29	0	215
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General Melter Data (contd)

Data Designation	Quantity	Range Resolution	Default	Remarks	Indexed Protocol		Full Map Word Offset
					Data Index	Channel Number	
Melter status: - heatup phase - startup protection - ready for operation - warning - fault - shutdown - standby - melter not enabled - motors not enabled	1	0 () 1 (heatup phase) 2 (startup protection) 3 (melter ready) 4 (warning) 5 (fault) 6 (shutdown) 7 (standby) 8 (melter not enabled) 11 (motors not enabled)	N/A	Read only	10	0	10
Seconds Left in Interlock Capability to let the user see how many seconds are left in the ready interlock delay.	1	0 - 3600	N/A	Read only	11	0	11
Hours Until Next Service	1	0 - 8736	N/A	Read only	12	0	12
Current alarm High byte: Channel Number of the involved channel (if there is a temperature failure) 1-18 (1 = Tank 2 = Manifold/Pump, 3 = Hose 1, 4 = Gun 1, etc) OR System Failure Number (if there is a system failure): Consult your Manual Low byte: Bit 0: System alarm Bit 1: Channel alarm Bit 3: Pressure alarm Bit 4: Tank Level alarm Bit 10: Fill System Fault	1	0000/FFFF		Read only	23	0	14
Melter status and alarms Bit 1: Host Communication Fault Bit 3: Service Reminder Bit 10: Fill System Fault Bit 11: Tank Low	1	0000/FFFF	N/A	Read only	15	0	15

Flow/Pressure Data

NOTE: Unless otherwise noted, the following data only applies to AltaTouch melters.

Data Designation	Quantity	Range Resolution	Default	Remarks	Flow and Pressure		Full Map Offset
					Indexed Protocol		
					Data Index	Channel Number	
Pressure Actual Value NOTE: Also applies to DuraBlue melters.	1-16	34.473 - 344.73 bar 500-5000 PSI 3447 - 34473 kPa	N/A	Read only	61	1-32	N/A
Underpressure Warning Value NOTE: Also applies to DuraBlue melters.	1-16	0 - 100%	20	Read/Write	70	1-16	N/A
Overpressure Warning Value NOTE: Also applies to DuraBlue melters.	1-16	0 - 100%	20	Read/Write	73	1-16	N/A
Motor Mode	1-4	0 = Manual 1 = Runup 2 = Pressure 3 = Flow	0	Read/Write	31	1-4	220-223
Motor Setpoint NOTE: Also applies to DuraBlue melters.	1-4	0 - 100%	0	Read/Write	32	1-4	73-76
Target Linespeed Pt.2/Scale Factor Linespeed	1-16/1-4	0 - 100%	100	Read/Write	33	1-16/1-4	N/A
Scale Factor Motor Speed	1-4	1-94 RPM	94	Read/Write	34	1-4	N/A
Motor Actual Speed	1-16	RPM	N/A	Read only	36	1-4	N/A
Target Linespeed Pt. 1	1-16	0 - 100%	0	Read/Write	39	1-16	N/A
Overpressure Fault Value	1-16	0 - 100%	50	Read/Write	76	1-16	N/A
Target Pressure Pt. 2	1-16	0 - 1000 PSI 0 - 68.9 bar 0 - 6894.7 kPa	500	Read/Write	80	1-16	N/A
Target Pressure Pt. 1	1-16	0-1000 PSI 0 - 68.9 bar 0 - 6894.7 kPa	100	Read/Write	81	1-16	N/A
Pressure Build Enable	1-16	0/1	0	Read/Write	82	1-16	N/A
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Flow/Pressure Data (contd)

Data Designation	Quantity	Range Resolution	Default	Remarks	Flow and Pressure		Full Map Offset
					Indexed Protocol		
					Data Index	Channel Number	
Stop Speed Threshold	1-14	0 - 100%	10	Read/Write	83	1 - 4	N/A
Pressure Build Setpoint	1-16	0 - 1000 PSI 0 - 68.9 bar 0 - 6894.7 kPa	50	Read/Write	84	1-16	N/A
True Flow Linespeed Setpoint	1-8	0 - 100%	100	Read/Write	90	1-8	
True Flow Flow Setpoint	1-8	1000-500,000 mg/min	20000	Read/Write	96	1-8	N/A
True Flow Flow Status	1-8	Bit 0: Warning Bit 1: Fault	N/A	Read only	101	1-8	N/A
True Flow Underflow Warning	1-8	0 - 100%	10	Read/Write	102	1-8	N/A
True Flow Underflow Fault	1-8	0 - 100%	25	Read/Write	103	1-8	N/A
True Flow Overflow Warning	1-8	0 - 100%	10	Read/Write	104	1-8	N/A
True Flow Overflow Fault	1-8	0 - 100%	25	Read/Write	105	1-8	N/A
True Flow Actual Flow	1-8	0 - 500,000 mg/mm	10	Read only	106	1-8	N/A
Line speed percent	1-4	0 - 100%	N/A	Read only	107	1-4	N/A
Motor minimum speed		0-94 RPM	0	Read/Write	35	0	N/A
Line Speed Type	1-4	0 - Line speed reference from 0-10V terminal. 3 - Each Motor Line speed will come from the 3rd,4th,5th and 6th of control words	0	Read/Write	224	0	N/A

Flow/Pressure Alarms

NOTE: The following table applies to AltaTouch and DuraBlue melters.

Data Designation	Quantity	Range Resolution	Default	Remarks	Flow and Pressure		Full Map Offset
					Indexed Protocol		
					Data Index	Channel Number	
Pressure Status and Alarms Bit 0: Underpressure Bit 1: Overpressure	1-16	N/A	N/A	Read only	79	1-16	N/A

Seven-Day Clock Data

NOTE: The following Index Protocol Data Designations are supported for all Alta, Dura, and ProBlue series melters unless otherwise indicated.

Data Designation	Quantity	Range Resolution	Default	Remarks	Indexed Protocol		Full Map Word Offset
					Data Index	Channel Number	
Seven-Day Clock switched ON / OFF, for field bus	1	0/1	0 (OFF)	Read/Write	200	0	19
Status: Seven-Day Clock in operation	1	0/1	N/A	Read only	201	0	20
Set Clock Day	1	1 - 7	N/A	Read/Write	202	0	21
Set Clock Hour	1	0 - 23	N/A	Read/Write	203	0	22
Set Clock Minute	1	0 - 59	N/A	Read/Write	204	0	23

Commands for Fill Features

NOTE: The following table applies only to Liberty melters.

Data Designation	Quantity	Range Resolution	Default	Remarks	Indexed Protocol		Full Map Word Offset
					Data Index	Channel Number	
Tank Fill Commands	1	0 (No command) 2 (Calibrate empty) 4 (Silence alarm) 8 (Reset refill fault)	0	Write only	196	0	120
Fill Time Delay	1	0 - 1000 S	3	Read/Write	162	0	218
Fill Time Limit	1	0 - 1000 S	30	Read/Write	163	0	219
* Fill Enable	1	0/1	1	Read/Write	197	0	121
* Tote Vibrator Time	1	0-30 S	10	Read/Write	198	0	122
* Actuator Counts	1	0-65535	0	Read/Write	199	0	123
NOTE: * These three are only available for melter software version 3.010 and higher.							

PML Data

NOTE: The following Index Protocol Data Designations are supported for all Alta, Dura, and ProBlue series melters unless otherwise indicated.

Data Designation	Quantity	Range Resolution	Default	Remarks	Indexed Protocol		Full Map Word Offset
					Data Index	Channel Number	
Current Mode: 0 Manual, 1 Automatic	1	0/1	0	Read Only	205	0	25
Current State: PML_UNDEFINED = 0 PML_OFF = 1 PML_STOPPED = 2 PML_STARTING = 3 PML_READY = 4 PML_STANDBY = 5 PML_PRODUCING = 6 PML_STOPPING = 7 PML_ABORTING = 8 PML_ABORTED = 9 PML_HOLDING = 10 PML_HELD = 11	1	0-11	0	Read/Write - Note: Setting this value to anything other than 0 will cause the melter to behave according to the PackML specification. Leave this value at 0 if PackML specification is not being used.	206	0	26
Current State Time	1	HHHH:MM:SS.hh	N/A	Read only	207	0	27
Current Mode Time	1	HHHH:MM:SS.hh	N/A	Read only	208	0	30
Off Time	1	HHHH:MM:SS.hh	N/A	Read only	209	0	33
Stopped Time	1	HHHH:MM:SS.hh	N/A	Read only	210	0	36
Started Time	1	HHHH:MM:SS.hh	N/A	Read only	211	0	39
Ready Time	1	HHHH:MM:SS.hh	N/A	Read only	212	0	42

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PML Data (contd)

Data Designation	Quantity	Range Resolution	Default	Remarks	Indexed Protocol		Full Map Word Offset
					Data Index	Channel Number	
Standby Time	1	HHHH:MM:SS.hh	N/A	Read only	213	0	45
Producing Time	1	HHHH:MM:SS.hh	N/A	Read only	214	0	48
Stopping Time	1	HHHH:MM:SS.hh	N/A	Read only	215	0	51
Aborting Time	1	HHHH:MM:SS.hh	N/A	Read only	215	0	54
Aborted Time	1	HHHH:MM:SS.hh	N/A	Read only	217	0	57
Holding Time	1	HHHH:MM:SS.hh	N/A	Read only	218	0	60
Held Time	1	HHHH:MM:SS.hh	N/A	Read only	219	0	63
Manual Mode Time	1	HHHH:MM:SS.hh	N/A	Read only	220	0	66
Automatic Mode Time	1	HHHH:MM:SS.hh	N/A	Read only	221	0	69
Clear PML Registers	1	0/1	0	Read/Write	222	0	72

Temperature Data

NOTE: The following Index Protocol Data Designations are supported for all Alta, Dura, and ProBlue series melters unless otherwise indicated.

Data Designation	Quantity	Range Resolution	Default	Remarks	Indexed Protocol		Full Map Word Offset
					Data Index	Channel Number	
Temperature unit: Celsius/Fahrenheit	1	0 (°C)/1 (°F)	0 °Celsius)	Read/Write	110	0	139
Activate Hose/Gun pair	1-8	0/1	0	Read/Write	112	1-8	140-147
Temperature setpoint value	1-18	40-230 °C/ 100-450 °F	N/A	Read/Write	115	1-18	149-166
Temperature setpoint value, global	1	40-230 °C/ 100-450 °F	N/A	Read/Write	116	0	167
Temperature setpoint value, group hose	1	40-230 °C/ 100-450 °F	N/A	Read/Write	117	0	168
Temperature setpoint value, group gun	1	40-230 °C/ 100-450 °F	N/A	Read/Write	118	0	169
Temperature actual value	1-18	40-230 °C/ 100-450 °F	N/A	Read only	120	1-18	171-188
Activate Temperature Channel	1-16	0/1	0	Read/Write	111	1-16	N/A
Temperature standby value, global	1	5-190 °C 10-350 °F	50 °C/100 °F	Read/Write	128	0	189
Time period for deactivating heaters (after automatic standby)	1	0-1440min (24h)	0 min	Read/Write	133	0	190
Time period for automatic standby mode activation (if no guns are active)	1	0 - 1440min (24h)	0 min	Read/Write	135	0	193
Undertemperature fault value, global	1	5-60°C/ 10-110 °F	0 min	Read/Write	142	0	194
Overtemperature fault value, global	1	5-60 °C/ 10-110 °F	15 °C/25 °F	Read/Write	152	0	195

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Data Designation	Quantity	Range Resolution	Default	Remarks	Indexed Protocol		Full Map Word Offset
					Data Index	Channel Number	
Field bus data: Temperature status and alarms Bit 0: Heater is ON / OFF Bit 1: Undertemperature warning Bit 2: Undertemperature fault Bit 3: Overtemperature warning Bit 4: Overtemperature fault Bit 5: Overtemperature shutdown Bit 6: Shorted temperature sensor Bit 7: Broken temperature sensor	1-18	0000/FFFF (0/1)	N/A	Read only	157	1-18	196-213
Auto Exit Standby	1	0 - 180 min	0	Read/Write	160	0	216

Adhesive Tracking System Data (ATS)

Data Designation	Quantity	Range Resolution	Default	Remarks	Indexed Protocol		Full Map Word Offset
					Data Index	Channel Number	
Target Add On	1	0-1,000,000mg		Read/Write (Double Words)	234	0	102-103
K Factor	0.001	800-1000	915	Read/Write	235	0	104
Detector Polarity	1	0- Light on, 1-Dark On	1	Read/Write	236	0	105
Specific Gravity	0.01	80-120	95	Read/Write	90	0	106
Products to Skip	1	0-200	10	Read/Write	237	0	107
Products Skip Time	1	1-60s	10	Read/Write	238	0	108
Products to Avg.	1	1-200	10	Read/Write	239	0	109
Product to Teach	1	5-50	8	Read/Write	240	0	110
Alarm Delay Count	1	1-15	4	Read/Write	241	0	111
Units	1	0-Metric, 1-English	0	Read/Write	242	0	112
ATS Control	1	bitmask: 0x01: reset totals if change to 1 0x02: clear alerts if change to 1 0x04: factory reset ATS if change to 1		Write only	232	0	116
System Mode	1	0-disabled, 1-Teach, 3-Enabled	0	Read/Write	233	0	117
Adhesive/Hour	1			Read only (Double Words)	225	0	88-89
Add-On/Product	1			Read only (Double Words)	226	0	90-91
Total Adhesive	1			Read only (Double Words)	227	0	92-93
Total Products	1			Read only (Double Words)	228	0	94-95

Adhesive Tracking System Data (ATS) (contd)

Data Designation	Quantity	Range Resolution	Default	Remarks	Indexed Protocol		Full Map Word Offset
					Data Index	Channel Number	
Alarm Status	1	0-None, 1- Add-on overlimit, 2-Add-on under limit, 4-Flow without trigger, 8--phase error, 16-OverFlow Error		Read only (Double Words)	229	0	96-97
Total Alarms	1			Read only (Double Words)	230	0	98-99
Defective Products	1			Read only (Double Words)	231	0	100-101
Alarm Low Limit	0-100%	5-50	20	Read/Write	103	0	118
Alarm Upper Limit	0-100%	5-50	30	Read/Write	105	0	119

