MAGTEK DEVICE DRIVERS FOR WINDOWS
PROGRAMMING REFERENCE MANUAL

Manual Part Number: 99875125 Rev 8

OCTOBER 2004

MAGTEK®

REGISTERED TO ISO 9001:2000

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REVISIONS

Rev Number	Date	Notes
1	20 Nov 98	Initial Release
2	16 Feb 99	Sec 1: Editorial comments for clarification; Sec 2: Added c_wr_secure and trks 1, 2, and 3; Sec 3: Editorial comments for clarification; Appendix A: Added MT-85 and clarified tables; Appendix D: Added c_wr_secure and tks 1, 2, and 3 and MT-85 Encoder sheet.
3	27 Apr 99	Global: Changed names of Mt-211 and MT-215 to port powered readers; Sec 3: Added card insertion note to event; Sec 4: Added this section, Data Parsing. Appendix A: Changed file names. Appendix D. Changed names.
4	21 Oct 99	Sec 1: added: part numbers of media, special commands, MICR material; Sec 2: changed properties table; Sec 3: added errors 45 and 60 to write command; Sec 4: added descriptions to language format; updated default formats; Sec 5: replaced Visual Basic example; Appendix A; Completely revised; Appendix D: added applied_fmt to all forms.
5	14 Dec 99	Appendix A: Added statement about "Long File Names" under "Adding MagTek Device Drivers" General Notes number 4; added statement to "Completing the Installation" about sharing a single port; Edited "Removing the Drivers"; added "Configuration Examples of NT Drivers." Appendix D: Under IntelliPIN PINPad and MSR, added statement under Remarks about IntelliPIN driver; under MiniWedge MSR added statement about ASCII and Character Conversion.
6	30 Nov 01	Editorial changes throughout and added Software Version MTD 1.10, which includes Windows ME/2000/XP.
7	14 Oct 03	Engineering upgrade to Software Version 1.12. Added ISO logo, Tech Support phone number, and Software License and removed Limited Warranty. Editorial throughout.
8	1 Oct 04	Updated to MTD 1.13 software release including Automated Installation Feature (Appendix A). Removed references to Windows 95.

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MagTek Part Number 99875125-2
13 June 2003

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TABLE OF CONTENTS

FIGURES

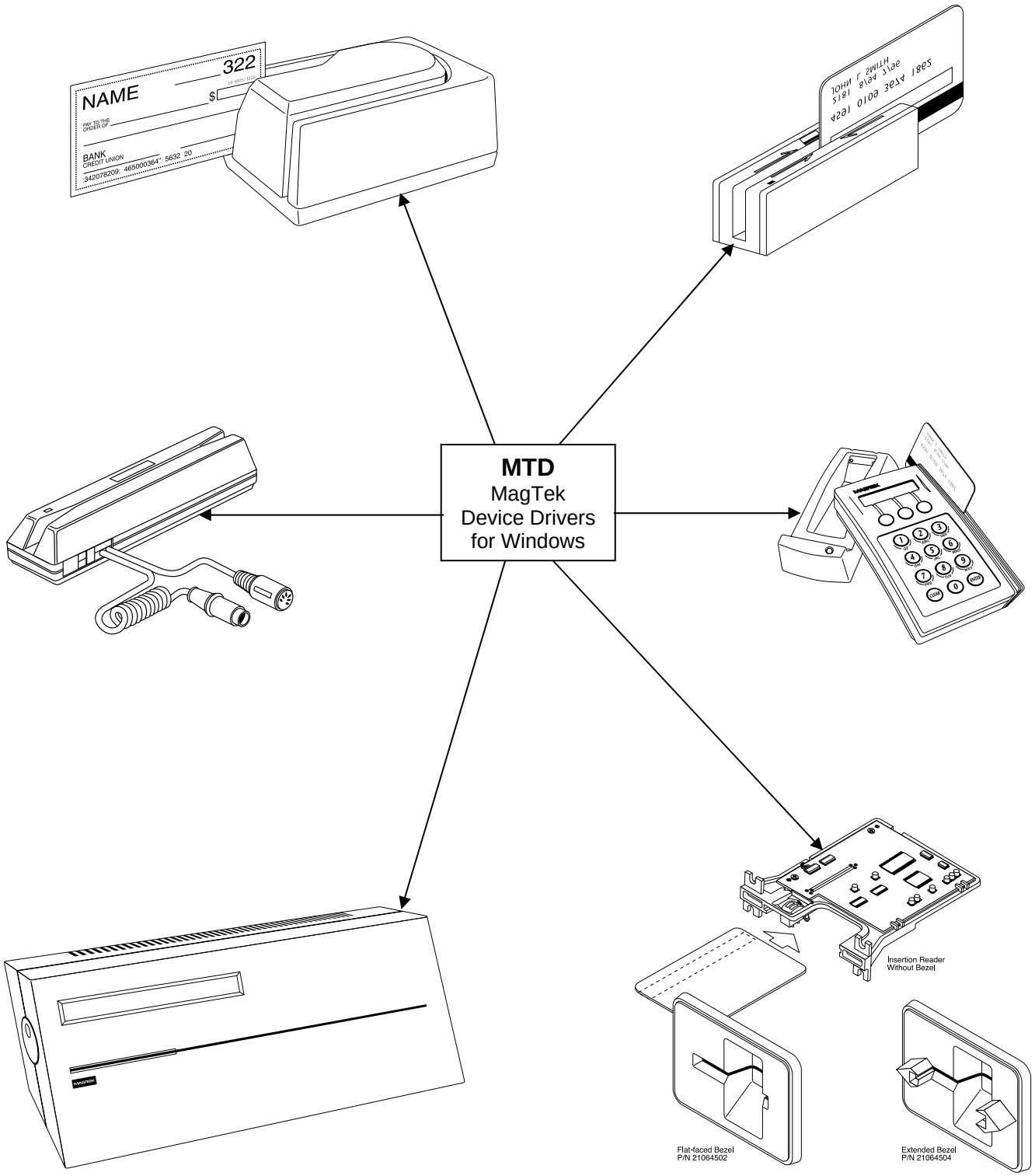


Figure 1-1. MagTek Devices and Device Drivers for Windows

SECTION 1. OVERVIEW

The MagTek Device (MTD) Drivers for Windows is a collection of individual drivers that support a number of MagTek products. These drivers provide a uniform application interface for controlling a wide range of MagTek devices. The drivers, combined with a device control language, solve many of the difficulties application developers face when attempting to control hardware devices. The difficulties mount when faced with the task of developing an application that supports an entire product line of devices.

Part Numbers for the MTD for all Windows platforms (95, 98, ME, NT, 2000, and XP) are as follows:

Part Number	**Medium**
30037385	CD
99510030	Internet*

*www.magtek.com

PROBLEMS WITH CONTROLLING DEVICES

The major problems with developing an application that supports an entire product line of devices are as follows:

- ***Each MagTek device has a unique set of commands***. The commands usually perform similar functions on a particular class of devices but either differs in syntax or have small variations in their functionality. An application would have to implement a custom mechanism to control each device it supported–much like DOS applications had to do to support various printers.

- ***Most MagTek devices communicate via data streams, not packets***. This means that an application receives data from the device one character at a time; it only receives partial command responses. It would be the application's responsibility to collect the incoming data and parse it into individual responses.

- ***Responses from MagTek devices are inherently asynchronous***. When an application sends a command that requires a response, the response from the device arrives (or worse, begins to arrive) long after the command is sent. The application would have to either poll the device until all of the response is collected or implement a callback mechanism to collect and receive it.

- ***Most MagTek devices maintain a communication protocol of some kind***. In addition to this, the protocols differ between devices. For example, some devices frame responses with STX and ETX control characters and others simply use a CR or require a checksum in the frame. To deal with this, an application would have to recognize and implement all of the various protocols for the devices it supports.

- ***`MagTek devices are attached to the host in different ways***. MagTek devices may be attached to a serial port, parallel port, to another device or even to the keyboard port. All these ports differ greatly in nature and would all have to be accessed by the application. Additionally, meaningful communication with a device attached to the keyboard port would be tricky at best. This is because the operating system does not provide a means to send data to the keyboard port nor any mechanism to discriminate between the device data and manual keystrokes.

BENEFITS OF A CONTROL LANGUAGE AND DRIVER

A device control language is defined to support most of the functionality of all MagTek devices. As noted previously, most devices of a particular class have similar functionality. The control language defines a common set of commands that perform these functions in the same way for all MagTek devices, thus eliminating device-specific coding for most applications. If the need arises to perform an operation on a device not covered by the common command set, a "raw" send and receive command can be used to communicate directly with the device, effectively eliminating any limitations on the amount of control you have over the device.

The control language is based on a simple property/command model. This model is familiar to most developers who deal with properties and methods in development environments such as Visual Basic or Delphi. You set up the device by getting and setting properties and operate it by invoking commands.

The command set presents a synchronous interface to the application even though the device operates asynchronously, greatly simplifying the effort in retrieving responses from a device. The pattern is simple: send a command to the device and invoke a read command, which will not complete until after the entire response is received from the device.

The control language is implemented by a driver, which completes the solution for the application developer. The driver adds the following benefits:

- ***Gives easy access to the device.*** All MagTek devices are presented uniformly as a virtual serial port, regardless of how they are actually attached to the host.

- ***Hides the communication protocol.*** Adding and stripping frames, performing checksums, detecting and correcting communication errors, etc, are handled completely by the driver. The application sees only the data that it is interested in and can be assured that it is free from transport errors.

- ***Converts the incoming data stream into complete responses.*** The application receives data from the device in easy to use packets. The entire response to a command is received in a single operation.

- ***Makes it easier to upgrade to a new device***. The driver shields you from differences in the new device's commands or interface. When upgrading the device, an application can

usually remain unchanged, even though the new device may be very different from the old one.

The features of a driver that implement a device control language completely shield an application developer from the complexities of device-specific functionality.

LANGUAGE OVERVIEW

The device control language is text based and designed to utilize the read and write file I/O facilities of the underlying operating system. All commands, their responses and properties consist of text strings that are written to or read from the driver using basic file I/O. The control language is based on a property/command model that is similar to the notions of properties and methods as accepted in environments such as Visual Basic or Delphi.

Properties

All properties are accessed in a uniform way: by using a **`get`** (**`/get`** *prop*) or a **`set`**(**`/set`** *prop*) command. Properties are either read/write or read only. A **`set`** command with a read only property will fail. All properties are identified by a string name and use strings for their arguments. Properties defined by the control language fall into the following three groups:

- ***Capability properties*** – These properties contain information about the capabilities of a particular device and are generally read only. They allow an application to query a device's capabilities to determine if the device is suitable for a particular task. Included in this category are **`c_cardwpin`**, **`c_check`**, **`c_pin`**, and **`c_magnetic`** (e. g., **`/get c_check`**).

- ***Configuration properties*** – These properties configure a device for different modes of operation or may alter the way some commands behave. Because of this, they are usually readable and writable. They give an application the ability to set up a device for a particular task that requires a specific, non-default mode of operation. Included in this category are **`capitalize`**, **`dev_version`**, and **`port_name`** (e.g., **`/set capitalize 1`**).

- ***Device-specific properties*** –These properties cover configuration requirements that are not common among MagTek devices, even if the devices belong to the same class. An application can determine if a particular set of device-specific properties is available by first querying the device's capabilities or version. Refer to Appendix D, Device Driver Summaries, for a particular driver to see how these properties are affected with an individual device.

Properties can be "action" properties. That is, the driver may execute an action on the device when a property is set. For example, an application can enable or disable magnetic stripe tracks by setting the **`trk_enable`** property. The driver responds by sending one or more commands to the device to enable or disable the desired tracks.

COMMANDS

Like properties, commands are identified by a string name and have string arguments. All commands are terminated by line feed <LF> or a carriage return. To invoke a command, an application simply writes it to the driver in the same manner as writing to a file or serial port. If the command has a response defined for it, the application reads it from the driver using the same I/O handle as in the write.

Four types of commands are defined by the device control language:

- ***Non-interactive*** – These commands manipulate the device without requiring any interaction with the user. The property commands **`get`**, **`set`**, **`reset`**, and **`ver`** are examples of this type.

- ***Interactive*** – These commands interact with the user. They do not necessarily require the user to do anything but may only prompt the user to do something. **`display`** is an example of such a command. Others, such as **`read`** or **`write`**, however, require user interaction to complete. For example, the user must either swipe a card or cancel the operation in order to complete a read command.

- ***Device-specific*** – These commands give access to device-specific features. For example, the **`load_key`** command is available for MagTek devices that use keys to encrypt data before sending it to the host.

- ***Raw*** – These are effectively escape commands. They allow the application to bypass the driver to perform device-specific operations that are not included in the driver syntax and not supported elsewhere. With these commands, an application has no limitations on the amount of control it has over a device. The raw commands can be formatted exactly as specified in the device documentation. The command bracketing will be inserted by the driver if required (e.g., <stx> and <etx> will be inserted for certain devices). Three commands are defined for this type: **`rawsend`** and **`rawrecv`**, used to send and receive data directly to the device, and **`rawxact`**, a transactional version that is a combination of the first two.

A small set of interactive and non-interactive commands is all that is required for an application to perform the most common tasks with these devices. Device-specific or raw commands should rarely be needed.

TYPICAL OPERATION

This section describes a typical pattern that an application developer may use to operate a device. Although it is the most typical pattern, it is by no means the only viable one. Refer to Section 5, Example Applications, to see how to use the drivers in various applications.

Open a device

Access to the device is obtained by opening the **com*xx***: port that the device was installed as. This is not the hardware port that the device may be attached to, but a *virtual* **com*xx*:** port presented by the driver (e.g., COM5 or higher). A handle is returned by the *open* function and is required for all subsequent interactions with the driver. When opened, the driver initializes itself and, where required, the device.

Some drivers support automatic settings. In this mode, the driver first attempts to communicate with the device at the previous setting or at the default setting if it is the first time. (The setting for the initial attempt is grayed out in the manual settings fields.) If the driver for certain devices (e.g., Mini MICR) does not receive a response, it will adjust the settings and try again. This sequence continues until the device responds or until all possible settings have been attempted.

If the driver is set for the automatic mode, it may take considerably longer for the device driver to detect an error. In particular, if the device is not connected to the specified port or if its power is off, the device driver may take several seconds attempting all possible settings before it returns an error. The application program should be tolerant of this delay. Not all of the devices support the automatic mode of detection.

Query the device's capabilities

The application can query the device to determine if it can perform the required task. The capability properties (**`c_xxx`**) are provided for this purpose. For example, if an application requires the ability to read checks, it can **`get`** the **`c_check`** property to determine if the device can read checks (e.g., **`/get c_check`**).

Prepare the device for work

The device is prepared for operation by setting one or more of the configuration properties. Its mode of operation and other features are set up by these properties. Setting the **`capitalize`** property to **`1`** to cause all data written to or read from a card's magnetic strip to be capitalized is an example of this type of initialization. In some cases, modifying a property may cause the driver to execute functions on the device.

Use the device

The device is now fully initialized ready for operation. Because most tasks with the device require interaction with the user, the application operates the device using primarily the interactive commands. A typical scenario is when, in response to some event, the user is

prompted to swipe a card by using the **display** command, followed by a **read** command to instruct the device to return the card data when swiped. All the facilities of the driver are utilized during this stage of operation.

Close the device

When the application is finished with the device, it simply closes the port using the handle obtained when it opened it. The driver shuts down the device if required.

METHODS OF ACCESSING THE DEVICE

This section describes how to use control language commands in a Visual Basic development environment using the MSComm (Microsoft Communication) component.

Obtaining access to the device

If the MSComm (Microsoft Communication) ActiveX component is used to access the device, set the **CommPort** property to the com port *number* of the device. Then, set the **PortOpen** property to **True** to open it. The following example shows how:

```
'set error handling
 On Error Resume Next

'open the port
 Comm.CommPort = 5
 Comm.PortOpen = True
 If Err.Number <> 0 Then
    <<process error>>
 End If
 on error goto 0
```

Note

After issuing an Open command, the computer may spend several seconds attempting to communicate with the device. During this time the computer will appear to be hung up.

If file I/O access is desired, you have the option of using either the device's friendly name, such as **\\.\micr+** (where **\\.** specifies to Windows that this is a device and not a file) or its port name, **COM<5..15>**. The friendly name is more intuitive and easier to remember than a port number; however, the serial method gives the programmer better control of the device. The port number can be found in the operating system's device UI. For example, open Control Panel/System/Device Manager/MagTek and select a specific driver. Under Properties, select the Settings tab. This gives both the Friendly Name and the port name (**COM<5-15>**). It also identifies the physical port that will be used to communicate with the device.

Open the device using either of the previous names. Use whatever facility is provided by your development environment for opening files. For Visual Basic, do the following:

```
'set error handling
 On Error Resume Next

'open the port for binary access
 Open "\\.\micr+" For Binary Access Read Write As #1
 If Err.Number <> 0 Then
 <<process error>>
 End If
 on error goto 0
```

Note

*The friendly name of the device, as found in the operating system's device UI (Device Manager in Windows 98, for example), must be prefixed with "**\\.**" in order to open the device. If the previous example did not have the prefix, it would create a file named **micr+** in the current directory–clearly not the desired result.*

Interacting with the device

An application interacts with the device by sending commands to the device and reading its responses. Commands are sent by writing to the opened port and responses from the device or property requests are retrieved by reading from the port.

To interact with the device using the MSComm component, invoke a command by assigning it to MSComm's **Output** property. The response is received by MSComm's **OnComm** event handler as a **comEvReceive** event or by directly polling the port. The entire response to a command or property request is received as a single event.

```
'submit echo command
 Comm.Output = "/echo Hello" + Chr$(10)

 Private Sub Comm_OnComm()
   'return if not a receive event
    If Comm.CommEvent = comEvReceive Then
       'process received data
       a$ = Comm.Input    'get echo data
    Else
       <<process non-read event>>
    End If
 End Sub
```

If using file I/O access, interaction with the device is indistinguishable from writing to or reading from a file.

```
'set up error handling
 On Error Resume Next

'submit echo command
 Put #1, , "/echo Hello" + Chr$(10)

'declare an input buffer
 a$ = String(2000, Chr$(0))

'read echo response from device
 Get #1, , a$
 If Err.Number <> 0 Then
    <<process error>>
 End If
```

Note

File I/O interaction with the device is synchronous; the read operation will block until a response is received from the device or is returned by the driver (as in a property request). This means that a read command cannot be canceled because the computer will not accept any new commands while one is pending. The only exception to this is when the development environment provides access to the Win32 API, giving the application the ability to use overlapped file I/O.

Releasing access to the device

Releasing access to the device is very simple. If using MSComm, close the device by setting its **`PortOpen`** property to **`False`**:

```
'close the port
mscomm1.PortOpen = FALSE
```

If opened as a file, close it as in the following:

```
'close the port
 Close #1
```

ERRORS AND ERROR PROCESSING

A command's execution status is returned to an application in the command's response, if it has one. The status value is a two digit numeric field located at positions 23 and 24 of the response (refer to Appendix C. Status Codes for a description of all error conditions) .

Errors are processed differently for property manipulation. If an error occurs while getting a property, the response will be returned with an empty property value. No status is returned when setting a property because the **`set`** command has no response defined for it.

If a command returns a non-zero status, indicating an error, an application can typically respond in the following manner:

1. It can prompt the user to repeat the action and re-submit the command. This is typical if the status does not indicate a failure, per se, but that the device may not be ready yet or first needs some other interaction by the user.

2. It can reset the device and prompt the user to repeat the action. Typically, this action is necessary if the device's state or configuration has been corrupted, but is otherwise functioning correctly.

3. Finally, the application can refuse to continue operation of the device. An application should do this only if the returned status indicates that the device is malfunctioning.

HANDLING SPECIAL COMMANDS

Generic Devices

Some devices such as the IntelliPIN support a set of commands that are not standard and/or do not follow the usual protocol. The ***Generic Driver*** can be used to support these commands. It does not know how to communicate with any device and does not support any protocol. The *Generic Driver* allows the application to send any string to a device. When the *Generic Driver* is used, the application must form the command, insert packet characters, and compute a check character where required. The ***Generic Driver*** only supports the "*raw*" commands.

The *Generic Driver* can be used whenever a deviation from the standard protocol is required or when no protocol exists at all. However, the *Generic Driver*, unlike all of the other drivers, does not support any properties. It is only available to support those cases that cannot be handled with the standard drivers.

IntelliPIN Driver

With release MTD 1.12, the IntelliPIN driver has been updated to support the special set of commands that require <si> and <so> instead of the usual <stx> and <etx> characters. These special commands that support the multi-master keys (e.g., 02, 04, 08, etc.) are not supported with the standard IntelliPIN commands. However, if these commands are used in the **`/rawsend`** or **`/rawxmit`** commands, the <si> and <so> will automatically be inserted.

MICR Format Numbers

In order to retrieve the built-in check properties (chk_***), the driver automatically configures the MICR units to format number 6500. However, there are some cases, especially outside the United States, where the check information is not consistent with format number 6500. In these cases, the installer has the option of modifying the format number string in the OEMSETUP.INF file.

The format number can be changed to another value (e.g., 7700 to allow use of a flex format) by editing the field following the format number entry (%CheckFormatCodeName%) in the OEMSETUP.INF file. This must be changed in three places depending on which drivers are to be used (MICR+, MiniMICR RS232, and MiniMICR Wedge). By defining a flex format that would duplicate the 6500 output format, the driver will still be able to parse the check data and present the individual properties (e.g., chk_account, chk_amount, chk_number, and chk_transit). If a suitable format cannot be developed to present the individual properties, the driver will still be able to present the check data (chk_data) as received from the MICR reader. If the existing format number in the MICR device is suitable, set the %CheckFormatCodeName% entry to null (i.e., “”), so it will not be modified by the Driver.

Refer to the appropriate MICR Technical Reference Manual for more information about the use of format numbers and available MICR fields.

FILE PROPERTIES

When updating the MagTek Device Drivers, discussing performance characteristics, or reporting errors, it will be important to identify the part number and version of the associated file(s). In order to determine which version is installed, use Windows Explorer and go to the \Windows\System directory. Right click on the associated “VXD” or “SYS” driver file (see Appendix A. Installation and Setup) and select *Properties*. Click on the *Version* tab. Note the *File Version, Part Number,* and *Description*.

INSTALLATION

The drivers are installed by means of an InstallShield application. All Windows platforms (95, 98, ME, NT, 2000, and XP) are supported. Refer to "Appendix A. Installation and Setup" for a full description of the installation procedure.

SECTION 2. PROPERTIES

This section lists the properties that are used in the MagTek Drivers. Properties can be interrogated by issuing a **`get`** command and modified with a **`set`** command. Refer to Section 3. Commands for complete description and examples of all commands.

The **`c_xxx`** properties are set by the driver and reflect the device's **capabilities**. However, the **`c_xxx`** properties **do not** indicate the configuration of the device. For example, a device may be capable of reading all three magnetic tracks but be configured to only read two tracks or a MICR reader, while often configured with a magnetic stripe reader, may not have an MSR installed. Unless otherwise noted, **`1`** means the capability is available, **`0`** or **null** (i.e., the value is not present) means that the capability is not available.

In this table, the *Access* information indicates whether the property can be modified (Read/Write –R/W) or merely accessed (Read Only–R).

Property	Access	Description
`account_no`	R/W	Cardholder account number, including check digit. It is set by the application to be used in PIN encryption commands (IntelliPIN).
`amount`	R/W	Transaction amount in cents, without punctuation (IntelliPIN).
`applied_fmt`	R	Indicates which format template was used to parse the magnetics data. If no template or rule is applied, this property returns a null.
`c_card_stat`	R	**`1`** indicates that the driver supports retrieval of card sensor status (e.g., PPINSERT)
`c_cardwpin`	R	**`1`** if the device supports reading of a card and a PIN in response to a single command (e.g., IntelliPIN).
`c_check`	R	**`1`** if the device can read checks (e.g., MICR devices).
`c_events`	R	**`1`** indicates that the driver supports unsolicited event notification (e.g., PPINSERT).
`c_keypress`	R	**`1`** if the device supports retrieval of a key press (e.g., IntelliPIN).
`c_keystring`	R	**`1`** if the device supports retrieval of a sequence of key presses (e.g., IntelliPIN).
`c_magnetic`	R	**`1`** if the device can read magnetic cards.
`c_mechanics`	R	This value indicates how the card reader's mechanism operates: **`0`** – manually operated device or no card reader **`1`** – device is mechanized and supports "eject" **`2`** – device is mechanized and supports "eject" and "confiscate"
`c_pin`	R	**`1`** if the device supports reading of PINs (e.g., IntelliPIN).
`c_smart`	R	**`1`** if the device supports smart cards.
`c_tracks`	R	A three-character string, representing the tracks supported by the device. The left-most position indicates track 1. Thus **`110`** indicates that the device can access tracks 1 and 2 but not track 3. See **`trk_enable`** to determine which tracks are enabled.

Property	Access	Description
c_write	R	**1** if the device can encode a magnetic card in either LoCo or HiCo; **2** if the device can encode a magnetic card in only the setting indicated in **wr_coer**
c_wr_secure	R	**0** if the device does not support secure mode; **1** if the device can switch between secure and non-secure mode (see **wr_secure**); **2** if the device only operates in the secure mode.
capitalize	R/W	Set this to **0** to prevent the driver from capitalizing the data for the **read** and **write** commands. The default value for this property is **1** (enable capitalization).
card_stat	R	Current card sensor status: **0** = not blocked, **1** = blocked (PPINSERT).
chk_account	R	Check account number from check (MICR).
chk_amount	R	Check amount from check (MICR).
chk_bankid	R	Bank ID number from the transit field (MICR).
chk_data	R	Output data string as received from MICR reader (MICR).
chk_format	R/W	Indicates the format of the check data. Set to **6500** by default. If this property is modified by the application, the **chk_xx** properties (except **chk_data** and **chk_status**) will be set to null. (MICR)
chk_mod10	R	Mod10 check digit from the transit field (MICR).
chk_number	R	Check number (MICR).
chk_routing	R	Routing number from the transit field (MICR).
chk_status	R	2-digit status code from the check just read (MICR).
chk_transit	R	Transit number from check (MICR).
cmd_pending	R	Command pending–indicates which command, if any, is pending. If none is pending, the second argument will be null: **/get cmd_pending**<*LF*>
dblpinentry	R/W	Set to **1** to enable double PIN entry such as when requesting a new PIN; set to **0** when verifying a customer's PIN (IntelliPIN).
dev_status	R	Device status. **0** means device is connected and operational. Any other value indicates a device-specific error. If the device fails to respond, a null value is reported: **/get dev_status**<*LF*>
dev_version	R	Device version string. This value is read directly from the device, if the device supports a version string. <*CR*> characters in the string read from the device will be replaced with **/**. This property will be useful in reporting operational problems to MagTek.
enable_cmc7	R/W	Set this property to **1** to enable CMC-7 characters decoding, **0** to disable it. This is used for international checks; see MICR manual for more information. (MICR)

Property	Access	Description
enc_key	R/W	Encryption key to use for the next encryption process (IntelliPIN): **Set** **Get** **Key** **M** **4** Master key **S** **5** Session key **0-3** **0-3** Lower working keys **A-J** **A-J** Upper working keys **WA-WZ** **A-Z** Working keys A-Z **Wa-Wz** **a-z** Working keys a-z
enc_key_sn	R/W	Serial number of encryption key. Used to specify key serial number for activating/deactivating PIN encryption in MSK mode and to return the key serial number in DUKPT mode. The key serial number is specified in clear text (IntelliPIN).
enc_mode	R/W	Current encryption mode – **msk** or **dukpt** (IntelliPIN).
entry_echo	R/W	Specifies how to display the characters when entered from the keypad on the LCD screen (IntelliPIN): • + (plus) to display as entered • - (minus) to suppress display • $ to display as amount The value of this property affects the operation of the **read key_string** command. By default this property is empty.
entry_len	R/W	Maximum number of characters (1-32) to be collected with the **read key_string** command. An empty value (default) for this property converts to a length of 1. (IntelliPIN)
entry_tout	R/W	Entry timeout: number of seconds (15-255) to wait for keypad input. (IntelliPIN)
events_on	R/W	Set to **1** to enable unsolicited event notifications. The default is **0**. (PPINSERT)
invalcmdrsp	R/W	Invalid command response: set to **1** to enable responses to invalid commands (useful during program development). This is set to **0** (disabled) by default.
key_parity	R/W	Set to **1** to enable parity check on encryption keys. (IntelliPIN)
lasterr	R	Status from the last command sent to the driver. A successfully executed command will reset this value to **0**. This property is useful for checking the operation of the **set** commands. After each **set,** the response to **get lasterr** should be **0**.
max_pin_len	R/W	Maximum PIN length (IntelliPIN): • 1 – 16 for **ibm** format (IBM 3624) • 4 – 12 for **ansi** format (ANSI 9.8)

Property	Access	Description
msg1 - msg4	R/W	Messages to show on LCD screen with various commands. **msg1** – used by the **read** and **display** commands **msg2** – used by the **display** and **read Card_w_pin** commands **msg3** – used by the **read Card_w_pin** command **msg4** – used by the **key_press** and **key_string** operations To specify leading spaces, use **\x20**. See the **display** command for more information. (IntelliPIN)
offline_enc	R/W	Set to **1** to enable encode capability in standalone mode with keyboard; **0** prevents standalone encoding (MT-95).
oper_tout	R/W	Operational timeout in seconds (15-255). (IntelliPIN)
pin_blk_fmt	R/W	PIN block format (IntelliPIN): **ansi** (ANSI 9.8) or **ibm** (IBM 3624)
pinfilldig	R/W	PIN fill digit (0..9, A..F) when **pin_blk_fmt** is **ibm** (IntelliPIN)
port_name	R	Indicates the virtual port number (e.g., COM6) derived from the friendly port name.
pwroffdelay	R/W	Power off time delay in minutes (5-255). (IntelliPIN)
s_down_tout	R/W	Shutdown timeout in hours (1-31). Set to **0** to disable. (IntelliPIN)
track1ss **track2ss** **track2ss**	R R R	Indicates Start Sentinel on Track 1 as received from the device. Indicates Start Sentinel on Track 2 as received from the device. Indicates Start Sentinel on Track 3 as received from the device.
trivpinchk	R/W	Set to **1** for trivial PIN checki.e., don't allow 1234. (IntelliPIN)
trk_enable	R/W	Enable reading and writing of individual tracks. The value of this property is a string of three characters, with **0** representing disabled tracks and **1** representing enabled tracks, e.g., **110** enables tracks 1 and 2 and disables track 3.
trk1data	R	Data from track 1 excluding start sentinel and end sentinel.
trk2data	R	Data from track 2 excluding start sentinel and end sentinel.
trk3data	R	Data from track 3 excluding start sentinel and end sentinel.
visa_mac1 **visa_mac2** **visa_mac3**	R	Message authentication codes returned by device after PIN is collected (DUKPT mode only). (IntelliPIN)
wr_coer	R/W	Encode Coercivity Mode (MT-95). Specifies the energy level used to encode the magnetic stripe: **0** = automatic selection **1** = LoCo only mode **2** = HiCo only mode
wr_secure	R/W	**0** indicates the card can be removed between a read and write operation. Set this to **1** to turn on secure online encode mode (MT-95).
xact_type	R/W	Transaction type – **d** = debit, **c** = credit (IntelliPIN).

Properties like **account_no** and those properties created by the data parsing templates (see Section 4) that are affected by a card transaction will be modified only when a card is read without errors.

SECTION 3. COMMANDS

This section describes all of the commands that can be used with the MagTek Windows Device Drivers. Some commands require parameters to indicate to the driver exactly what function is to be performed. While there are a few device-specific commands, most commands can be used with any device.

DATA FORMAT

All commands sent to the driver and all responses received are strings of printable ASCII characters delimited by <*LF*>. The driver will also accept <*CR*> as a delimiter. All command and response strings begin with the character **/**. If a command has arguments, they should be separated with one or more white spaces. The driver accepts space <*SP*> and <*TAB*> as white space characters.

Note

A command delimiter sent immediately after the previous command delimiter is interpreted as an empty command and is ignored by the driver.

RESPONSES

All responses to the transaction commands are formatted with fixed fields, to allow them to be parsed either by scanning for white spaces or by using constant offsets into the response string. In the descriptions of the commands found later in this section, the arguments sent with the responses are shown in their respective locations but may not indicate the exact number of spaces. The actual responses are sent in a fixed-field format, as shown in the following table:

Field	Offset	Size	Comment
command name	0 (0-11)	12	This field identifies the command that produced this response, e.g., **/get** is followed by 8 spaces to fill the 12 locations.
arg1	12 (12-23)	12	Fixed-size argument – value depends on the command sent. A property name is left justified in the field and begins in location 12. Status information is right justified in the field (with a trailing space) so the SS value will always be located at positions 21 and 22.
arg2	24 (24-??)	var	Variable size argument – used for responses with variable-size data, like **/get** *prop* or **read** *status data.*

Examples:

```
00000000001111111112222222222
01234567890123456789012345678 9
/read            -00082
/get        trk_enable  110
```

NOTATION CONVENTIONS

The following conventions are used in the tables that follow.

`Fixed Size (Bold)`	Used to represent literals (symbols, exactly as sent or received from driver)
Italic	Used to represent placeholders (variable fields)
[]	Expression parts in brackets are optional. The brackets are never a part of the syntax
<*LF*>	ASCII control character. The only ASCII control characters used are <*LF*> (0x0A) and <*CR*> (0x0D).
(a|b)	Means that the expression can be either a or b, e.g., X(1|2) means either X1 or X2. The parentheses and the | are never part of the syntax.

COMMAND DESCRIPTIONS

The following list of commands includes function, syntax, errors, remarks, and examples as applicable.

cancel

Function Cancel a command.

Syntax **`/cancel`** [*cmd*]

The optional *cmd* can be any of the transaction commands such as:

`/cancel rawrecv`
`/cancel rawxact`
`/cancel read`
`/cancel write`

If *cmd* is omitted, any pending commands will be canceled.

Errors If the specified command is not active, the command is ignored and there is no response.

Remarks The command being canceled will send a response immediately.

Example If a **`read`** command has been issued but the operation is to be aborted:

Command **`/cancel read`**<*LF*>

Response **`/read    -00082`**<*LF*>

display

Function Show a single message or two alternating messages on the device's display.

Syntax **`/display`** *[x]*

The optional argument *x* indicates the message to be displayed.

Errors *none*

Remarks If the optional argument *x* is provided, this command displays it as a single message. If *x* is **@**, the driver sends a command to the device to display the idle message **00** ("Welcome"). If *x* is omitted, the command uses the values of the **msg1** and **msg2** properties for the message texts. If **msg2** is empty, this command displays the text in **msg1**; otherwise, it displays the texts in **msg1** and **msg2** as alternating messages. The message texts are displayed unmodified, except for any '\' characters, which are used as escape characters:

\r is converted to 0x0D (shown as <*CR*> in this document)

\n is converted to 0x0A (shown as <*LF*> in this document), e.g., to be used as line separator for LCD screens that can display multiple lines

\\ is converted to \

\x*hh* is converted to a character with ASCII value *hh* (always two hex digits). Not all ASCII values can be displayed.

Leading and trailing spaces are removed from the message texts in the *x* argument and the **msg1** and **msg2** properties. **\x20** may be used for adding leading spaces.

To center the message "Thank You" on the IntelliPIN LCD:

Command **`/display \x20\x20\x20Thank You`**

Response *none*

echo

Function Echo data–driver test command.

Syntax **`/echo`** *string*

string is limited to 11 characters (the width of the 'arg1' field in the response format) without any embedded spaces.

Errors *none*

Remarks The driver responds by echoing the command back. If the command specifies a string that is longer than 11 characters or if a space appears, the response will be truncated. There is no translation for escape (\x00) commands. This command cannot be cancelled with **`/cancel`**.

Example If you wish to ensure that the driver is properly installed, request it to echo a string:

Command **`/echo Testing`**<*LF*>

Response **`/echo Testing`**<*LF*>

event

Function Response to an unsolicited event notification.

Syntax *none*

Errors *none*

Remarks This response can occur when an unsolicited event, such as card inserted, occurs.

The format of the response is: **`/event`** *n data*

n is a numeric event code:

`1` – medium has been inserted into the reader

`2` – medium has been removed from the reader

data specifies the type of medium that was inserted/removed:

`M` – magnetic

Events are sent to the application only if the **`c_events`** property is **`1`** (driver supports events) and the **`events_on`** property is set to **`1`** by the application.

If a card has already been inserted when the driver is opened, there will not be any notification when **`events_on`** is enabled. Consequently, it is recommended that **`/get card_stat`** be issued immediately after opening the driver to see if a card is blocking the sensor.

Example If you wish to be notified when a card has been inserted into the PPINSERT:

Command **`/set events_on 1`**<*LF*>

Response **`/event 1 M`**<*LF*>

When a card is inserted into the slot.

get

Function Get a property.

Syntax **`/get`** *prop*

prop is one of the valid properties shown in Section 2 or any of those from data parsing.

Errors **`/get abc`**<*LF*>

Since **abc** does not exist.

Remarks The driver sends a response in the format: **`/get`** *prop val*.

If the requested property does not exist, the *val* field will be empty, i.e., <*LF*> follows the *prop* field. If the command was cancelled, both the *prop* and *val* fields will be empty. In some cases, this command will interrogate the device to determine the property setting. Some properties cannot be interrogated if a command (such as read) is pending. The value will be null in this case.

Example If you wish to find out which tracks are enabled, request the **`trk_enable`** property:

Command **`/get trk_enable`**<*LF*>

Response **`/get trk_enable 110`**<*LF*>

Indicating track 1 & 2 are enabled, track 3 is disabled.

load_key

Function Load an encryption key into the device.

Syntax **/load_key** *n key*

n can be one of the following values:

M – master key (*key* is in clear text)

S – session key (*key* is encrypted under Master Key)

0 ... **3** – lower working keys (*key* is encrypted under Session Key)

A ... **J** – upper working keys (*key* is encrypted under Session Key)

key is the 16- or 32-character value of the key to be loaded.

Errors **/load_key 30**<*LF*>

If the *n* field is invalid, *key* is the wrong length, or the device sends an error (e.g., there is a key parity error).

/load_key 45<*LF*>

If the required key is not loaded.

Remarks This command is used to load a key into the device. With all but the master key, the selected key is encrypted under another key so the application must know the encrypted value of the key. The response to this command is: **/load_key** *SS*
SS is a two digit status code; 00 – success, 30 – invalid, 45 – rejected, etc.

Example To load the session key encrypted under the master key:

Command **/load_key S 99E1E835662DEA94**<*LF*>

Response **/load_key 00**<*LF*>

rawrecv

Function Receive data from the device.

Syntax **/rawrecv**

Errors **/rawrecv** **45**<*LF*>

If a command is already pending.

/rawrecv **82<LF>**

If the command was canceled by the user (e.g., with CLEAR key)

Remarks This command overrides the default processing of the next message that comes from the device and returns it to the application as a **rawrecv** response. Only one message from the device will be processed in this manner, after that the driver switches to normal operation. The response to this command is in the following format: **/rawrecv** *status x*

status is a 2-digit decimal value (refer to Appendix C. Status Codes for a complete description of the status values)

x is the data received from the device with the following characters replaced:

- <*CR*> is replaced by **\r**
- <*LF*> is replaced by **\n**
- **** is replaced by ****
- any other non-printable characters are replaced by ***\xhh***, where *hh* is the two digit hex code of the character.

If a **/rawsend** command is sent that will cause the device to send back a response, the application should either submit a **/rawrecv** command before sending the data with **/rawsend**, or (better) use the **/rawxact** command.

Note

In some cases, the framing characters in the response are extracted by the driver and are not presented to the application.

Example To receive card data when the IntelliPIN is operating in the VeriFone mode:

Command **/rawrecv**<*LF*>

Response **/rawrecv** **00** **;12345?**<*LF*>

rawsend

Function Send arbitrary data to the device.

Syntax **/rawsend** *x*

x is an arbitrary string which is transmitted directly to the device. The string *x* is passed as-is to the device, except for '\' which is used as an 'escape' character:

- **r** is converted to <*CR*>
- **n** is converted to <*LF*>
- \\ is converted to \
- **x**_**hh**_ is converted to a character with ASCII value *hh* (always two hex digits), e.g., **x20** is converted to a space.

Errors *none*

Remarks This command as with the other **raw** commands supports any features that have not been implemented in the standard set of commands. **Note**: the driver inserts appropriate framing characters, e.g., <stx> and <etx> or <si> and <so> for certain IntelliPIN commands.

Example To change the default message 00 to show "Welcome to Our Bank" on two lines of the IntelliPIN:

Command **/rawsend 5100Welcome to\x1COur Bank**<*LF*>

Response none

Note: When using C++, include an extra slash to include the "/r": "//rawsend…"

rawxact

Function Execute a send/receive transaction with the device in raw mode.

Syntax **/rawxact** *x*

x is an arbitrary string which is transmitted directly to the device. The string *x* is passed as-is to the device, except for '\' which is used as an 'escape' character:

- **r** is converted to <*CR*>
- **n** is converted to <*LF*>
- \\ is converted to \
- **x**_**hh**_ is converted to a character with ASCII value *hh* (always two hex digits), e.g., **x20** is converted to a space.

Errors **/rawxact 45**<*LF*>

If a command is already pending.

/rawxact 82<*LF*>

If the command was canceled by the user (e.g., with CLEAR key)

Remarks This command is a combination of **/rawsend** and **/rawrecv**. It sends the supplied data to the device, overrides the default processing of the next message that comes from the device and returns it to the application as a **/rawxact** response. After the response is returned (or canceled), the driver switches to normal operation. The syntax for this command is identical to the syntax of the **/rawsend** command; the syntax of the response is identical to the **/rawrecv** response.

Example To load a master key of 23AB4589EF6701CD into the IntelliPIN:

Command **/rawxact 9423AB4589EF6701CD**<*LF*>

Response **/rawxact 00 940**<*LF*>

read

Function Read data from the device.

Syntax **`/read`** *[[x] y]*

The optional argument *x* specifies the data source; if *x* is missing, a card will be read. Refer to the Read Argument table below for a description data sources.

The optional argument *y* is used to specify a message to be displayed on the LCD screen, if supported, before carrying out the command. If *y* is omitted and the device supports a display, the text in the **`msg1`** property is shown. In order to use *y*, the *x* argument must be present. See the **`display`** command for the description of the message format for *y*.

Errors **`/read -00045`**<*LF*>

If a command is already pending or the **`enc_key`** is not defined for **`read pin`**.

`/read -00082`<*LF*>

If the command was canceled by the application (82) or by the user (83) (e.g., with CLEAR key).

Remarks The response to this command has the following format: **`/read`** *status data*
The *status* field is a 6-character string aligned to the right in the arg1 field. It is formatted as follows: $TX_1X_2X_3SS$

T defines the type of data that was read:

- **`C`** = a check was read
- **`M`** = a magnetic card was read
- **`P`** = a PIN was read
- **`K`** = a key press or string was read
- **`-`** = indeterminate: no data was received from the device. Returned on errors not specific to the data type, such as command canceled (SS=**82**).

X_i define a media-specific status. For checks, this is the decimal representation of the check read status, as defined in the MICR specification. For magnetic cards, XXX indicates the read status for each of the three magnetic tracks (see **`card`** in the Read Arguments table below for a description of the status). For PIN data this status is always **000**; for keypress and string data, *XXX* is the data length in characters.

SS is a two-digit status code. **00** indicates a good read (but some tracks may be bad); any other status code indicates an error. These error codes indicate an error in the communication between the driver and the device or driver's internal errors. Read errors are reported in the X_i fields and do not cause the SS field to be set to a non-zero value. See Appendix C. Status Codes.

The *data* format is described in the **`write`** command below.

Example To request an amount to be entered by the customer on the IntelliPIN:

Command **`/set entry_len 6`**<*LF*>
`/read key_string Enter the amount`<*LF*>
Response **`/read K00300 123`**<*LF*>

Example To read a card (from any device):

Command **`/read card`**<*LF*>
Response **`/read M10900 ;12345?`**<*LF*>
track 1 error, track 2 good, track 3 blank

Read Arguments

The optional argument *x* used in the **read** command specifies the type of data to read and *y* specifies the text to be displayed. The following table describes the recognized *x* arguments for the **read** command:

Read Argument	Description
any	Read any type of data. This option is equivalent to **read** without any arguments.
card	Read magnetic stripe card. Display message (**msg 1**) if defined. When the user swipes a card, the response will be in the following format: **/read M***$X_1X_2X_3$SS data* *X_I* define the track read status for each of the three tracks, as follows: 0 = good track 1 = bad track 9 = no track data. *SS* is a two-digit status code; it is not affected by errors reported in the *X_i* field: 00 – successful read 82 – canceled, etc. *data* is the card data for all successfully read tracks.
card_w_pin	Read magnetic stripe card and collect PIN from cardholder. Display messages if defined. This command is similar to the **read card** command except that after the card is swiped, the device collects and stores the cardholder's PIN. The PIN can be collected later by issuing the **read pin** command. Before issuing this command, the following properties may be set: **msg1, msg2, msg3** – messages to be displayed while waiting for card swipe and PIN entry (a default message will be used if these properties contain empty strings). The response to this command is identical to the **read card** response; if successful, it returns the track data from the magnetic card. If the response status *SS* is **00**, the **read pin** command can be used to collect the PIN.
check	Read check data. When the user reads a check, the response will be in the following format: **/read C***$X_1X_2X_3$SS data* *XXX* is the decimal representation of the check read status, as defined in the MICR specification, e.g., **004** indicates a bad character in the check number field. *SS* is a two-digit status code: 00 – successful read, 82 – canceled, etc. This status is not affected by errors reported in the XXX field. *data* is the check data, which is also available in **chk_data**. The data format depends on the setting of the **chk_format** property.

Read Argument	Description
chk_or_card	Read magnetic stripe card or check data. When a card or check is swiped through the device, the driver sends the respective response.
key_press	Display a message (**msg4**) on the LCD screen, if available, and wait for a key on the keypad to be pressed. The device will wait for **entry_tout** seconds for the key press (by default 0 for no timeout). The response to this command is: **/read K***XXXSS K* *XXX* is the number of keys collected. Always 001 on successful read, 000 if failed. *SS* is a two-digit status code: 00 – successful read, 81 – timeout, etc. *K* is the ASCII representation of the pressed key (if *SS* is **00**).
key_string	Display a message (**msg4**) on the LCD screen, if available, and collect a string of key presses (digits) from the device. The following properties affect this command: • **entry_tout** – number of seconds to wait for input (by default 0 for no timeout) • **entry_echo** – how to display the characters entered from the keypad on the LCD screen: "0" (zero) to display, "+" to echo, "-" **-** (minus) to suppress display, "**$**" to display as amount. Empty by Default (must be set prior to use). • **entry_len** – maximum number of characters to be collected. An empty value for this property is interpreted as a length of 1 by the device (default). The response to this command is in the following format: **/read K***XXXSS data* *XXX* is the data length in characters *SS* is a two digit status code: 00 – successful read 30 – entry – echo not set 81 – timeout 83 – input aborted, etc. *data* is the string collected from the device.

Read Argument	Description
pin	Collect PIN from cardholder and read PIN data from the device. The following properties may be set before issuing this command: • **account_no** – cardholder account number, including check digit, if required • **amount** – transaction amount in cents, without punctuation, if required • **enc_key** – (MSK mode only) encryption key to use: **M** for master, **S** for session, **0-3** for lower working keys, **A-J** for upper working keys. • **xact_type** – (DUKPT mode only) transaction type: **D** for debit, **C** for credit The response will be: **/read P000***SS pin_block* *SS* is a two-digit status code: 00 – successful read 45 – **enc_key** is not defined 83 – aborted, etc. *pin_block* is the encrypted PIN block as returned by the device. Upon successful read, the following properties will be set: • **Visa_mac1, visa_mac2, visa_mac3** – message authentication codes (DUKPT mode only) • **enc_key_sn** – serial number of encryption key (DUKPT mode only)

reset

Function Reset the device.

Syntax **`/reset`**

Errors *none*

Remarks Clear any pending operations and reset the device to initial state. This does not affect any of the properties.

Example To return a device to its initial state:

Command **`/reset`**<*LF*>

Response *none*

set

Function Set a property.

Syntax **`/set`** *prop val*

prop is one of the valid properties (R/W) shown in Section 2. Properties

val represents the value of that property.

Errors *none*

Remarks This command is used to define each of the properties that are required prior to sending a command.

Example To load the key serial number in the IntelliPIN:

Command **`/set enc_key_sn 0123456789012345`**<*LF*>

Response *none*

ver

Function Read driver version.

Syntax **`/ver`**

Errors *none*

Remarks The response to this command is sent in the following format: **`/ver`** *num text*

num is the driver's part number

text is a free format version string. It may contain a tagged-format data enclosed in parentheses, as shown in this example

This **is not** the version of the device.

Example To determine the version of the currently active driver:

Command **`/ver`**<*LF*>

Response **`/ver 30037395 Mag-Tek Device Driver (Version=1.04 Model=IntelliPIN)`**<*LF*>

write

Function Data encode command.

Syntax **/write** *data*

Errors **/write** **94**<*LF*>
Encode is not supported on this device.
/write **34**<*LF*>
The *data* field was in the incorrect format.
/write **82**<*LF*>
The **write** command was canceled.
/write **45**<*LF*>
Device in wrong mode (e.g., if /**read** already issued)
/write **60**<*LF*>
Error during write operation (e.g., on MT-95)

Remarks The *data* field is in the following format:

[**%***an-data***?**][**;***n-data***?**|**@***a-data***?**][(**+***n-data***?**|**#***an-data***?**|**!***an-data***?**|**&***an-data*)]

an-data is alphanumeric data (ASCII characters ‘ ‘ to ‘_’ (0x20 to 0x7f))

n-data is numeric data (ASCII characters ‘0’ to ‘?’ (0x30 to 0x3f))

The data should not contain the end sentinel character (**?**).

If the application sends data for an alphanumeric track that contains lowercase characters (ASCII values beyond 0x60), they will be capitalized if **capitalize** = **1**. To disable this and send the data as-is to the device, set the **capitalize** property to **0**. The three sub-sections of the data string represent the three tracks on the magnetic card. The data for each track begins with a start sentinel character, which defines both the track number and the data format for the track:

%	identifies track 1 (7-bit alphanumeric)
;	identifies track 2 (5-bit numeric)
@	identifies track 2 (7-bit alphanumeric)
+	identifies track 3 (5-bit numeric)
!	identifies track 3 (CA Driver License)
#	identifies track 3 (alphanumeric, AAMVA)
&	identifies track 3 (7-bit alphanumeric)

Note that any or all of the data may be missing, but the order of the data for the tracks must always be in order (1, 2, 3). A missing track is interpreted as “don’t write” for the data encode command – that track will not be overwritten by the encode operation.

The response sent for this command is: **/write** *status*.

status is **00** if the encode succeeded and non-zero if it failed.

See the definitions of the status values in Appendix C. Status Codes.

Example Encode tracks 1 and 2:

Command **/write %B12345^TEST^0000?;12345?**<*LF*>

Response **/write** **00**<*LF*>

SECTION 4. MAGNETIC CARD DATA PARSING

This section describes the flexible data parsing language to be used by the MagTek device drivers to parse specific fields from magnetic card data and expose those fields as properties which may be retrieved by an application using the **/get** command. The data parsing language is flexible in that it can define both standard and custom formats to be parsed by the driver.

GOALS

For most MagTek devices, the MTD drivers completely hide the device-specific commands and peculiarities, thereby allowing applications to use the same command set and logic for all devices.

Up to this point, the above mentioned encapsulation has not been applied to the data returned by the device when a magnetic card is swiped. It has been left to the application to interpret the card data. This can become troublesome because the track formats and or/data contained on each track vary depending on the type of card (e.g., ATM or Drivers License).

The goals for the flexible data parsing are:

- easy to specify formats
- allow parsing of standard formats
- allow extending formats with custom fields
- allow detection of format and applying different parsing
- allow for missing tracks and missing fields by setting the corresponding property to empty
- allow presets to be loaded from the registry
- to expose parsed fields to applications via the **/get** command
- allow MagTek or system integrators to define formats in the driver installation file (OEMSETUP.INF).

ASSUMPTIONS

- The driver validates the format template and rules for syntax, but it cannot validate the format string for correctness in relation to parsing the fields of data. For example, if the format string specifies that a field has a fixed size of 3 and it actually has a fixed size of 4, the driver will not detect this.
- There is no backward parsing (i.e., field identifiers come before the field). For example, if A identifies an account number, it cannot follow the account number (e.g., 12344556A). It must come before the account number (e.g., A12344556).
- Beginning and end sentinels are specified in the format string for magnetic data formats.
- The terminating separator that follows a variable length property field is included in the format string as a literal.
- There are no parsing interdependencies between fields of data and/or format rules.

- Property names specified in format rules are 11 characters or less, consisting of alphabetic characters, digits, and '_'. The property name begins with an alphabetic character.
- Properties used in format strings do not conflict with properties defined by the driver. If there is a duplicate property (e.g., dev_version) specified in the format strings, the driver will return the value of the parsed property rather than the device version string.
- Magnetic stripe formats are comprised of the following types of fields.

Format Code	–	One or two characters specifying the format of the data to follow
Field Separator	–	Used to delimit fields of data
Fixed-Size	–	Data field which is fixed-length
Variable-Size	–	Data field which is variable-length and is terminated by a field separator
Optional	–	The data is either a fixed-size field or a field separator (if the field is not present)

DESCRIPTION

The MTD driver supports up to 8 different card formats. Each format consists of a name, a template, and a set of rules. There may be multiple rules for a single template, but there can only be one template per format name. The *name* identifies the format. The *template* provides a high-level format to which the data is to be compared so as to determine if the rules for the format in question should be applied. The *rules* are specific format strings that specify how to parse the data and the properties into which the parsed data is to be stored.

When the driver applies a format, it will make that knowledge available to an application through a property which can be retrieved with the /**get** command.

The driver may be parameterized with the formats via values in the device's software key in the registry. The following REG_SZ registry values are supported where *x* is a number 1-8.

fmt*x*_name	name for format
fmt*x*_template	format template
fmt*x*_rules	one or more comma-delimited rules

When the driver receives data from the device, it attempts to match the incoming data to one of the templates. If a template matches, the driver attempts to parse the data using one of the rules corresponding to the matched template. It sequentially attempts to apply each rule in the order that it appears in the fmtx_rules property. If the driver cannot apply any of the rules, the driver attempts to match the data to the next template and apply its rules until it either successfully applies a rule or runs out of templates.

If the driver is successful in applying one of the rules, the name of the applied format is available in the property **applied_fmt.**

LANGUAGE FORMAT

Format Name
(fmtx_name)

The format name specifies an identifier by which to identify the format template and/or rules being applied. The maximum length of this property is 11 characters. The names can be repeated on subsequent templates.

Format Template
(fmtx_template)

The format template provides a high-level structure to which the incoming data must conform in order to apply the format's rules. It is formed by concatenating characters and asterisks contained in angle brackets (<>) or parenthesis. The *format template* string cannot exceed 63 characters. The following is an example:

%<*>?;59<*>?(!|#)<*>?

The above template specifies that if track 1 exists; the first two characters following the start sentinel of track 2 are "59"; and the start sentinel character for track 3 is either '!' or '#' then the rules for this template should be applied.

The <*> symbol specifies a don't-care situation. All data up to the character following the <*> in the template string is ignored when evaluating the data against the template. All other characters in the template string must be matched with the data.

Format Rules
(fmtx_rules)

The format rules property specifies one or more rules that describe how the data is to be parsed. It is a comma-separated string of rules where each rule has the following format:

{<rule>}

Because the '{' and '}' characters are used to delimit each rule and specify optional tracks, these characters cannot be specified as literals within the rule.

A format rule describes how the data is to be parsed. Characters that must be matched as literals are placed as is in the string or preceded with a '\' if the character is one of the following: '[', ']', '(', ')', '*', '_', '<', '>', ':', '.', or '\'. Fields that are either to be parsed or ignored are contained within <>. The *format rules* string cannot exceed 1027 characters. The following is an example for retrieving the customer name and account number from track 1:

{%B<acct_no>^<cust_name>^<*>?}

The '%' specifies the start sentinel and 'B' specifies a format ID for the track. These two characters must be matched for the remainder of the rule to be executed. <acct_no> specifies that all data up to the following '^' should be stored in a property named "acct_no". <cust_name> specifies that all data up to '^' should be stored in a property named "cust_name". <*> specifies that the remainder of the track data up to '?' should be ignored.

The following table describes the procedure for specifying fields. Remember that property names can have a maximum of 11 characters.

Note

If there is a property specified more than once in a rule, the last successful match will be saved in the property. The driver will ignore previous matches and the value will not be compared to the previously saved value for consistency.

Field Type	Example	Description
Variable size field	<acct_no>	All data up to the next field separator or end sentinel is stored in a property named "acct_no".
Fixed size field	<exp_date[n]>	Store the next *n* characters in a property named "exp_date".
Variable size field with limit	<cust_name[x..y]>	Store at least *x* characters and at most *y* characters up to the next field separator or end sentinel into property named "cust_name".
Variable size (ignore)	<*>	Ignore all characters up to the next character specified in the format string (usually a field separator) or the end sentinel character (?).
Fixed size (ignore)	<*[n]>	Ignore the next *n* bytes.
Variable size with limit (ignore)	<*[x..y]>	Ignore at least *x* characters and at most *y* characters up to the next literal found.

Field Type	Example	Description
Literal	^	A literal is placed in the string as is and is used to determine if a particular format should be applied and to mark the end of a variable-length field.
Non-ASCII literal	\r, \n, \\, \xhh	Specify an escape character or non-ASCII character. • **\r** is converted to <CR> • **\n** is converted to <LF> • **** is converted to **** • **\x*hh*** is converted to a character with ASCII value *hh* (always two hex digits).
Optional choice	(x|y|…)	The field specifies a choice where the data can be either a literal or a property field. There may be any number of literals specified but there may not be more than 1 property field, for example (=|<country_code[3]>). If the character is a '=', skip it; otherwise store the next three characters into a property named "country_code".
Optional field	[x]	Specifies an optional sequence that may or may not be present in the data. *x* may be one or more literal fields, property fields, or optional choice fields.
Optional track	{xy}	The data parser will not enforce that the track be present in the data when attempting to match the data to the template or rule. *x* must be a literal field or an optional choice field containing a literal. *y* may be any sequence of fields except for another optional track field.

There can be more than one rule specified for a particular format template. The rules should be placed in a single string enclosed in curly braces (i.e., '{' and '}') and delimited with commas ','. When the driver applies rules for a particular template, it sequentially attempts to apply each rule in the order it is provided in the fmtx_rules string. For example: "{rule 1},{rule 2},{rule 3}" would cause the driver to first try to apply rule 1. If the incoming data did not match rule 1, the driver attempts to apply rule 2 followed by rule 3 if rule 2 fails. If no rules can be applied, the driver attempts to match the incoming data to the next template.

The property name can also contain a modifier at the end preceded by a ':' which specifies the type of data to store in that property. For example <cust_name:A> specifies that customer name should contain alphabetic characters, spaces, and punctuation. The modifier may also be used with ignore-fields (i.e., <*>). If no modifier is provided, any type of characters is assumed. The set of supported modifiers is described in the following table:

Modifier	Description
A	Alphabetic characters (A..Z a..z), space, and punctuation (. , : ') are allowed.
D	Numeric characters (0..9).
N	Alphanumeric characters. This is the union of A and D.
\xhh	**\x*hh*** is converted to a character with ASCII value *hh* (always two hex digits). Only this character is allowed in the field. This modifier is only valid for "ignore" type fields.
*	Any character is allowed (default if no modifier supplied).

DEFAULT FORMATS

The MTD drivers will be assigned parameters with default formats for parsing magnetic stripe data. The formats will be placed in the INF file for the driver and written to the registry when the driver is installed. Some examples are shown below; more are included with the drivers. In these examples, spaces are inserted between fields for readability; they should not be included in the actual rules.

```
fmt1_name      "ISO59"
fmt1_template"%B<*>^<*>^<*>?;59<*>=<*>?"
fmt1_rules     "{%B<*>^<*[3]><LastName>/<FirstName>\x20<MidName>
               ^<*[7]><DiscData1>?
               ;<PAN[13..19]>=<*[3]><ExpDate[4]><SrvCode[3]><DiscData2>?},
               {%B<*>^<*[3]><LastName>/<FirstName>^<*[7]><DiscData1>?
               ;<PAN[13..19]>=<*[3]><ExpDate[4]><SrvCode[3]><DiscData2>?}"

fmt2_name      "BankCardA"
fmt2_template"%A<*>^<*>^<*>?;<*>=<*>?"
fmt2_rules     "{%A<LastName>/<FirstName>\x20<MidName>^<*>^<*[7]><DiscData1>?
               ;<PAN[13..19]>=<ExpDate[4]><SrvCode[3]><DiscData2>?},
               {%A<LastName>/<FirstName>^<*>^<*[7]><DiscData1>?
               ;<PAN[13..19]>=<ExpDate[4]><SrvCode[3]><DiscData2>?}"

fmt3_name      "BankCard"
fmt3_template"%B<*>^<*>^<*>?;<*>=<*>?"
fmt3_rules     "{%B<*>^<LastName>/<FirstName>\x20<MidName>.<Title>
               ^<*[7]><DiscData1>?
               ;<PAN[13..19]>=<ExpDate[4]><SrvCode[3]><DiscData2>?},
               {%B<*>^<LastName>/<FirstName>.<Title>^<*[7]><DiscData1>?
               ;<PAN[13..19]>=<ExpDate[4]><SrvCode[3]><DiscData2>?}"

fmt4_name      "CADL"
fmt4_template"%(C|S|D|I|R)<*>?;600646<*>?{(#|!)<*>?}"
fmt4_rules     "{%<*[1]><FirstName>\x20<MidName>\x20<LastName>[\x20]<*:\x20[0..57]>
               <Adr[29]><City[13]>?
               ;<*[6]><DLID[9]><*>=<ExpDate>=<DateOfBirth[8]>?
               {(#|!)<*[8]><State[2]><ZIP[9]><Sex[1]><Hair[3]><Eye[3]><Hgt[3]><Wgt[3]>
               <*>?}}"
```

```
fmt5_name      "AAMVA"
fmt5_template"%<*>?;<*>?{(+|%|#|!)<*>?}"
fmt5_rules     "{%<State[2]><City>^<LastName>$<FirstName>$<MidName>^<Adr>^<*>?
               ;<*[6]><DLID>=<ExpDate[4]><DateOfBirth[8]><*>?
               {(+|!|#|%)<*[2]><ZIP[11]><*[16]><Sex[1]><Hgt[3]><Wgt[3]><Hair[3]>
               <Eye[3]><*>?}},
               {%<State[2]><City>^<LastName>$<FirstName>^<Adr>^<*>?
               ;<*[6]><DLID>=<ExpDate[4]><DateOfBirth[8]><*>?
               {(+|!|#|%)<*[2]><ZIP[11]><*[16]><Sex[1]><Hgt[3]><Wgt[3]><Hair[3]>
               <Eye[3]><*>?}}"
```

In the examples for CADL (California Drivers License) and AAMVA (all other drivers licenses), the braces around the rules for track 3 indicate that track 3 is optional.

EXAMPLE

Retrieving properties from a magnetic card

In this example, the rules above have been stored in the registry by the installation script.

The following data is received from the device:

```
%B1234567890074589^SMITH/JOHN Q.MR^99121012547000000000000123?
;1234567890074589=991210112547?
```

Format 1 (ISO59) would not be applied because the first two digits of track 2 are not 59. Format 2 (BankCardA) would not be applied since there is not an ‘A’ following the start sentinel. However, the data fits the template for format 2 (BankCard).

The following properties and their corresponding values will be exposed:

LastName	→	“SMITH”
FirstName	→	“JOHN”
MidName	→	“Q”
Title	→	“SMITH”
DiscData1	→	“254700000000000123”
PAN	→	“1234567890074589”
ExpDate	→	“9912”
SrvCode	→	“101”
DiscData2	→	“12547”

The application receives the successful read response **/read M00900 <card data>.**

The application issues **/get applied_fmt**.
The driver responds with **/get applied_fmt BankCard.**
The application issues **/get FirstName** to the driver.
The driver responds with **/get FirstName JOHN.**

The application issues **/get LastName** to the driver.
The driver responds with **/get LastName SMITH.**

The application issues **/get PAN** to the driver.
The driver responds with **/get PAN 1234567890074589.**

The application issues **/get ExpDate** to the driver.
The driver responds with **/get ExpDate 9912**.

After all of the required properties have been retrieved, the application can place them in appropriate strings as required by the application.

Note

The Properties retrieved from a magnetic card are only changed when valid data is received. After a good card has been read, the property (e.g., PAN) will be set to the value read from the card. If the next card read contains an error, the previous value will still be available. This can be confusing because the PAN, for example, will contain the value from the previous card. In order to avoid this problem, the affected property should be explicitly cleared after the value has been read.

It is suggested, for example, to clear the PAN after completing a transaction by sending the following command:

```
/set PAN 0
```

SECTION 5. EXAMPLE APPLICATIONS

While each application in this section is oriented toward a specific programming language, different devices are addressed in each example. It may be useful for the reader to look at all examples to understand how the MagTek Windows Drivers can operate with various MagTek devices.

PROGRAMMING HINTS

When opening a Keyboard Wedge device, the application must wait for any key press to complete, e.g., **ALT-0**. The application should wait until all keys have been released.

VISUAL BASIC EXAMPLE

This program is a simple example of using the MagTek Windows device drivers in Visual Basic. It opens the device driver and waits for the user to click the read button. At that time, it arms the driver for the read operation and waits for a read to take place. When the check data (in the case of a MICR) is received, it displays the data and waits for the read button to be pressed again.

The user first presses the Start button to open the port. After that, the Read button is pressed to initiate a read. After the check is read, the Read button can be pressed again for another cycle. The Exit button can be pressed at any time to quit the program.

```
Option Explicit

'+-----------------------------+
'|     MTD Driver example      |
'+-----------------------------+
'| written in Visual Basic 5.0 |
'+-----------------------------+
'
' (c) Copyright Mag-Tek, Inc. 1999
' All rights reserved
'
' Mag-Tek Part Numbers:
' Source code - 30037336 REV 101
' PROG 3.5" - 30037335 REV 101

' Purpose:  This program is a simple example of using the
' Mag-Tek Windows device drivers (MTD) in Visual Basic.  It
‘ opens the device driver and waits for the user to click the
‘ read button.  At that time, it arms the driver for the read
' operation and waits for a read to take place.  When the
' check data (in the case of a MICR) is received, it displays
' the data and waits for the read button to be pressed again.

' The user first presses the Start button to open the port.
' After that, the Read button is pressed to initiate a read.
' After the check is read, the Read button can be pressed
' again for another cycle.  The Exit button can be pressed
' at any time to quit the program.
```

```
' The form needs to contain:
'  1) an "MSComm" object named MSComm1

'  2) a button named btnStart, should be set to Enabled
'     and Visible with the caption "Start"

'  3) a button named btnRead, should be set to Disabled
'     and Visible with caption "Read"

'  4) a button named btnExit, should be set to Enabled
'     and Visible with caption "Exit"

'  5) a text box named txtInfo, should be set to Visible, Enabled and
'     MultiLine containing initial text of "Click the Start button to
'     open the port"

‘ Note: Lines shown ending in an underscore are continuation line, i.e.
‘       its one BASIC statement, split over two or more lines.
‘       The underscore MUST be preceded by a space, otherwise BASIC
‘       will interpret it as part if the statement and generate an
‘       error.

' This is the global buffer we'll use to collect the data
Dim RcvdData$

'+---------------+
'| btnExit_Click |
'+---------------+-----------------------------------+
'| Close the com port (if open) and exit the program |
'+---------------------------------------------------+
Private Sub btnExit_Click()
  If MSComm1.PortOpen Then
    MSComm1.PortOpen = False
  End If
  Unload Me
End Sub

'+---------------+
'| btnRead_Click |
'+---------------+-------------------+
'| This function does the following: |
'|  1) Disable the read button       |
'|  2) Send the read command         |
'|  3) Wait for the read response    |
'|  4) Display the read data         |
'|  5) Reenable the read button      |
'+-----------------------------------+
Private Sub btnRead_Click()
  ' Disable the read button so we don't get two read
  ' commands pending
  btnRead.Enabled = False

  ' Clear the receive buffer
  RcvdData$ = ""

  ' Send the read command
```

```
  MSComm1.Output = "/read card" & Chr$(10)

  ' If the device has check reading capability, then the
  ' following command would be used to read only the check
  ' data
  ' MSComm1.Output = "/read check" & Chr$(10)

  ' If the device can read only one media type (e.g. a
  ' card reader) then the read command "/read" command can
  ' be is issued by itself.
  ' MSComm1.Output = "/read" & Chr$(10)

  ' If the device is capable of reading more than one
  ' media type and the application is capable of accepting
  ' data from any of the media, then the read command can
  ' be issued by itself or with the "any" parameter.  (They
  ' are equivalent.)
  ' MSComm1.Output = "/read" & Chr$(10)
  '   or
  ' MSComm1.Output = "/read any" & Chr$(10)

  ' Ask the user to do the read
  txtInfo.Text = "Please swipe a card or click on Exit to quit"

  ' Wait until the card is read.
  ' In real life, the program can do other things while
  ' waiting for the data
  Do
    DoEvents
  Loop Until Len(RcvdData$) > 0

  ' Display the received data
  txtInfo.Text = RcvdData$

  ' Reenable the read button
  btnRead.Enabled = True
End Sub

'+----------------+
'| btnStart_Click |
'+----------------+-------------------------------------------------+
'| This function does the following:                                |
'|  1) Set up the buttons and display                               |
'|  2) Open the device under its "friendly name" as a file          |
'|  3) Retrieve its "unfriendly name" (e.g. "COM12")                |
'|  4) Extract the com port number from the unfriendly name         |
'|  5) Close the device (IMPORTANT: this must be done or you will not |
'|     be able to open the device again, in any mode, without       |
'|     resetting the computer)                                      |
'|  6) Open the device under its "unfriendly name" as a serial device |
'+------------------------------------------------------------------+
Private Sub btnStart_Click()
  ' will hold the fully qualified name of the driver
  Dim NewName$

  ' will be used to get data from the device driver
  Dim buf$
```

```
' will hold the numeric port number
Dim PortNumber As Integer

' prevent the Start button from being pressed again
btnStart.Enabled = False

txtInfo.Text = "Please wait.  Opening the port as File IO"
txtInfo.Refresh

' declare space for an input buffer
buf$ = String(2000, Chr$(0))

' If the virtual serial port number is unknown, it can be
' obtained by opening the driver in "File" mode with
' the "Friendly Name" and asking for the virtual COM port number.
'
' The sequence is:
' 1) Open the driver as a binary file
' 2) Request the "port_name" property
' 3) Close the driver
' 4) Open the serial port using the number obtained above
' 5) Send/receive commands/data
' 6) Close the serial port when done
'
' As of release 1.08.01 of the MTD drivers,
' the default Friendly Names are:
' ------------------------------------------------------------------
' "Mag-Wedge"
' "MT-85"
' "MT-95"
' "Port-powered swipe reader"
' "Port-powered insert reader"
' "MiniWedge"
' "MICR+"
' "Mini MICR RS-232"
' "Mini MICR Wedge"
' "IntelliPIN RS-232"
' "IntelliPIN Wedge"
' "IntelliPIN MICR Aux"
' "Generic Serial (RS-232)"
' "Generic Wedge (Keyboard)"
'
' Prepend "\\.\" to the "friendly" name which
' tells Windows that this is a device name and not a file name
NewName$ = "\\.\" + "MiniWedge"

' Trap the "file not found" error if the
' device is not present or ready
On Error Resume Next

' Try to open the device, this can take anywhere from one
' second to one minute
Open NewName For Binary Access Read Write As #1

' If the driver was unable to open the device, then
' inform the user
```

```
If Err.Number <> 0 Then
   ' Process error using Err.Description
   ' contains error description for the demo,
   ' we'll just display it
   txtInfo.Text = Err.Description

   ' Reset the error handling
   On Error GoTo 0

   ' exit this sub
   Exit Sub
End If

' reset the error handling
On Error GoTo 0

' send the command to get the port number
Put #1, , "/get port_name" + Chr$(10)

' get the response from driver which should contain the
' com port number
Get #1, , buf$

' Expected response:
' (character position in the response string)
'                1111111112222222222
'       12345678901234567890123456789
' e.g. "/get        port_name   COM14"

'+========================================+
'|| IMPORTANT: CLOSE THE DEVICE DRIVER    ||
'||            BEFORE TRYING TO REOPEN IT ||
'+========================================+
Close #1

' Make sure we got back a valid response.
‘ This checks that we have received a “/get” response and that
‘ “port_name” and “COM” are present and in the right locations.
If Left(buf, 4) = "/get" _
   And InStr(buf, "port_name") = 13 _
   And InStr(buf, "COM") = 25 Then

   ' Just for information, display the com port number
   txtInfo.Text = "Opening Serial IO on port " & Mid(buf, 25, 5)

   ' Get the port number value from character position 28
   ' (and 29 if two digits long) of the response
   PortNumber = Val(Mid(buf, 28, 2))

   '+-----------------------------------+
   '| open the driver as a serial device |
   '+-----------------------------------+

   ' make sure the on_comm function will be
   ' triggered by the device driver by setting
   ' the receive threshold to 1 (one)
   MSComm1.RThreshold = 1
```

```
    ' Set the com port number retrieved from the response
    MSComm1.CommPort = PortNumber

    ' Open the com port and establish communications with the device
    MSComm1.PortOpen = True

    ' enable the read button
    btnRead.Enabled = True

    txtInfo.Text = "Click on the Read button to read a" _
      & "card or Exit to quit."
  Else
    ' If we got here, then the device did not open correctly
    ' as a file IO so some kind of error handling is needed
    txtInfo.Text = "Error: Got back: " & buf
  End If

End Sub

'+------------------+
'| Form_QueryUnload |
'+------------------+--------------------------+
'| When this form is closed make sure the port |
'| is closed                                   |
'+---------------------------------------------+
Private Sub Form_QueryUnload(Cancel As Integer, UnloadMode As Integer)
  If MSComm1.PortOpen Then
    MSComm1.PortOpen = False
  End If
End Sub

'+----------------+
'| MSComm1_OnComm |
'+----------------+------------------------+
'| This event is automatically activated   |
'| whenever the device driver returns data |
'| to the program                          |
'+-----------------------------------------+
Private Sub MSComm1_OnComm()

  ' If this event handler was called because data was
  ' received from the device (via the device driver), then
  ' process that data
  '
  ' In this demo, it is just stored in the "RcvdData" buffer
  If MSComm1.CommEvent = comEvReceive Then
    RcvdData$ = MSComm1.Input
  End If
End Sub
```

C++ EXAMPLE

The following is an example of C++:

```
/* ---------------------------------------------------------------------- */
/*                          TST: Test Application                         */
/*                                                                        */
/*             MTDTEST.C - Test module for Mag-Tek device drivers          */
/* ---------------------------------------------------------------------- */
/* Version 1.00                                          $Revision::    $ */
/* ---------------------------------------------------------------------- */

#include <windows.h>
#include <stdio.h>
#include <conio.h>
#include <string.h>

/* --- Static variables ------------------------------------------------- */

static volatile BOOL    quit = FALSE;
static char             sbuff[128];
static HANDLE           drv_h;
static HANDLE           in_threadh;
static HANDLE           out_threadh;
static OVERLAPPED       ov_r, ov_w;

/* --- Macro definitions ------------------------------------------------ */

#define OPEN_DEVICE(name)                                                \
   CreateFile(                                                           \
      (name),                       /* LPCTSTR - pointer to name of the file */ \
      GENERIC_READ | GENERIC_WRITE,/* DWORD   - access (read-write) mode    */ \
      0,                            /* DWORD   - share mode                  */ \
      NULL,                         /* LPSECURITY_ATTRIBUTES                 */ \
                                    /*         - pointer to security attribs */ \
      OPEN_EXISTING,                /* DWORD   - how to create               */ \
      0  |                                                                 \
      FILE_FLAG_OVERLAPPED,         /* DWORD   - file attributes             */ \
      NULL                          /* HANDLE  - template handle             */ \
      )

/* --- Internal Function Prototypes ------------------------------------- */

void  input_thread     (void *p);
void  output_thread    (void *p);

/* --- Main ------------------------------------------------------------- */

int main ( int argc, char *argv[])
   {
   HANDLE   ret_h;
   DWORD    ws;
   DWORD    retdw;
   int      stage=1;
```

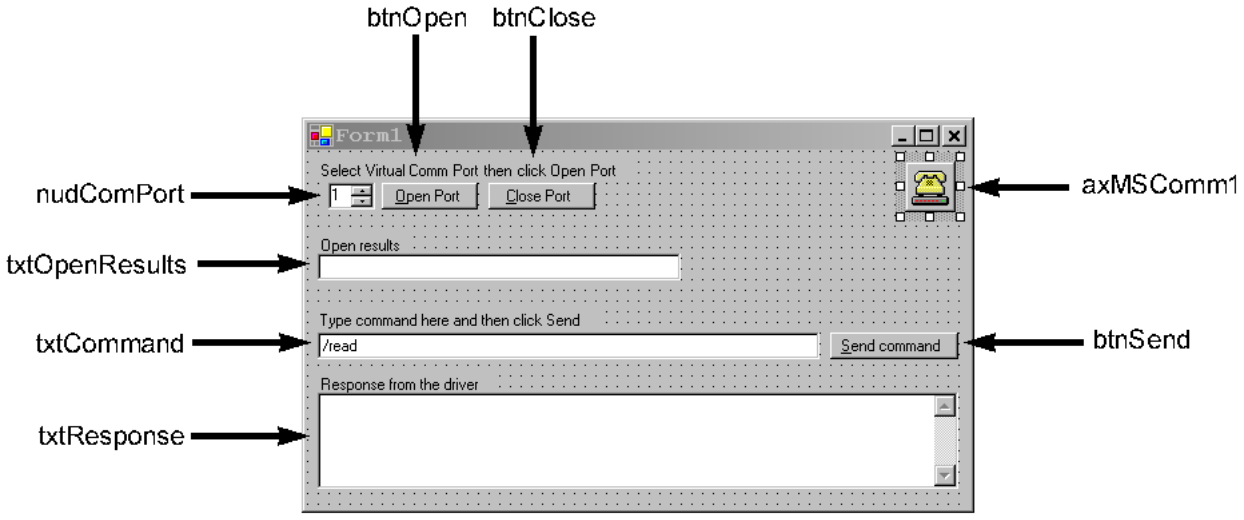
```
   /** clear overlapped structure */
   memset ( &ov_r, 0, sizeof (ov_r) );
   memset ( &ov_w, 0, sizeof (ov_w) );

   if (argc < 2)
      drv_h = OPEN_DEVICE ("COM5");   /* Must Specify proper COM# as default */
   else
      drv_h = OPEN_DEVICE (argv[1]);
   if (drv_h == INVALID_HANDLE_VALUE)
      {
      ws = GetLastError();
      printf("Can NOT open device : %s. Error : 0x%lx", "", ws);
      return ( stage);
      }

   { DCB dcb;
   GetCommState(drv_h, &dcb);
   dcb.BaudRate = CBR_9600;
   dcb.Parity   = NOPARITY;
   dcb.ByteSize = 8;
   dcb.StopBits = ONESTOPBIT;
   dcb.fParity  = 0;
   dcb.fBinary  = 1;
   dcb.fOutxCtsFlow = 0;
   dcb.fOutxDsrFlow = 0;
   dcb.fDtrControl = DTR_CONTROL_ENABLE;
   SetCommState(drv_h, &dcb);
   }

   #define STAGE(idx, op, msg)                              \
                               ret_h = op;                  \
                               if (ret_h==NULL)             \
                                  {                         \
                                  printf("%s\n", (msg));    \
                                  break;                    \
                                  }                         \
                               stage = idx;

   do {
      STAGE ( 6, CreateEvent (NULL, TRUE, FALSE, NULL),
                 "Can't Create Overlapped Event(read)" );
      ov_r.hEvent = ret_h;

      STAGE ( 7, CreateEvent (NULL, TRUE, FALSE, NULL),
                 "Can't Create Overlapped Event(write)" );
      ov_w.hEvent = ret_h;

      STAGE ( 8,
              CreateThread(
                 NULL,       // address of thread security attributes
                 0L,         // initial thread stack size, in bytes
                 (LPTHREAD_START_ROUTINE)output_thread,// adr of thread function
                 NULL,       // argument for new thread
                 0L,         // creation flags 0-run immediately
                 &retdw      // address of returned thread identifier
                 ),
              "Can't Create output thread" );
      out_threadh = ret_h;
STAGE ( 9,
              CreateThread(
```

```
                NULL,       // address of thread security attributes
                0L,         // initial thread stack size, in bytes
                (LPTHREAD_START_ROUTINE)input_thread,// addr of thread function
                NULL,       // argument for new thread
                0L,         // creation flags 0-run immediately
                &retdw      // address of returned thread identifier
                ),
             "Can't Create input thread" );
      in_threadh = ret_h;
      Sleep(100);
      printf("\nTest Console started. (press <^Z> to terminate).\n");
      } while (0);

   switch ( stage)
      {
      case 9:
         WaitForSingleObject (in_threadh, INFINITE); printf ("\n");
      case 8:
         quit = TRUE;
         ws = WaitForSingleObject ( out_threadh, 300);
         if (ws != WAIT_OBJECT_0)
         {
            DWORD ret_len;
         }
         SetEvent (ov_r.hEvent); //@@out_ev);
         ws = WaitForSingleObject ( out_threadh, INFINITE);
         CloseHandle ( out_threadh );
         CloseHandle ( in_threadh );
      case 7: CloseHandle ( ov_w.hEvent );
      case 6: CloseHandle ( ov_r.hEvent );
      case 1: CloseHandle ( drv_h );
      }

   return (0);
   }

/* --- Helpers ------------------------------------------------------------- */

#define SINGLE_CHARS

void  input_thread     (void *p)
   {
   int   ch;
   DWORD ws;
   char  str[100];

   ch = 0;
   while(!quit)
      {
      #ifdef SINGLE_CHARS
      ch = getch();
      printf("%c", ch);
      if (ch == 13)
       printf("\n");
      if ( ch == 0 )
             {
                  if (kbhit())
                  {
                       ch = 0x100 + getch();
                  }
```

```
            }
      #else
      gets(str);
      strcat(str, "\n");
      ch = str[0];
      #endif
      switch (ch)
         {
         case 0x1a:        // <Ctrl-Z> - emergency exit
            printf("\n---Exit---\n");//@@
            quit = TRUE;
            break;
         default:
            if (ch < 0x100)
               {
               BOOL           rs;
               DWORD          ret_len;
               #ifdef SINGLE_CHARS
               rs = WriteFile(drv_h, &ch, 1, &ret_len, &ov_w);
               #else
               rs = WriteFile(drv_h, str, strlen(str), &ret_len, &ov_w);
               #endif
               if (!rs)
                  {
                  ws = GetLastError ();
                  if ( ws != ERROR_IO_PENDING)
                     printf("DeviceIOControl (Write) Error : %i (0x%x)\n", ws, ws );
                  }
               rs = GetOverlappedResult (
                     drv_h,            // handle
                     &ov_w,            // address of overlapped structure
                     &ret_len,         // address of actual bytes count
                     TRUE              // wait flag
                     );
               if (!rs)
                  {
                  ws = GetLastError ();
                  printf("Write Error : %i (0x%x)\n", ws, ws );
                  }
               }
            else
               {
               }
            break;
         } /* switch (ch) */

      // give output thread chance to catch 'quit' character from driver
      // @@ there should be a better way to do this
      if (ch == 0x1b)
                     Sleep(200);
      }
   }

#define BUFSZ  128

void  output_thread    (void *vp)


{
   BOOL           rs;
```

```
   DWORD          read_len=0;
   char           wbuff[1];
   char*          p;

   while (!quit)
      {
      rs = ReadFile(drv_h, wbuff, sizeof(wbuff), &read_len, &ov_r);
      if ( !rs)
         {
         rs = GetLastError ();
         if ( rs != ERROR_IO_PENDING)
            {
            printf("DeviceIOControl (Read) Error : %i (0x%x)\n", rs, rs );
            break;
            }
         }
      rs = WaitForSingleObject ( ov_r.hEvent, INFINITE);
      rs = GetOverlappedResult (
            drv_h,         // handle of file, pipe, or communications device
            &ov_r,         // address of overlapped structure
            &read_len,     // address of actual bytes count
            FALSE          // wait flag
            );
      if (quit)
                  break;
      if ( rs )
         {
         p = wbuff;
         while (read_len >0)
            {
            if (*p == 0x1a)
                           {
                                 quit = TRUE;
                                 printf("\n\nExiting Test...");
                                 break;
                           }
            putch (*p);
            ++p;
            --read_len;
            }
         }
      }
   };
// end of file
```

C#.NET EXAMPLE



Active control names

Source (Form1.CS)

```
using System;
using System.Drawing;
using System.Collections;
using System.ComponentModel;
using System.Windows.Forms;
using System.Data;

namespace MTD_Example
{
  /// <summary>
  /// Example code for using the MTD Driver with C#.Net
  /// </summary>
  public class Form1 : System.Windows.Forms.Form
  {
    private System.Windows.Forms.Button btnOpen;
    private System.Windows.Forms.TextBox txtCommand;
    private System.Windows.Forms.Button btnSend;
    private System.Windows.Forms.TextBox txtResponse;
    private System.Windows.Forms.Button btnClose;
    private System.Windows.Forms.NumericUpDown nudComPort;
    private AxMSCommLib.AxMSComm axMSComm1;
    private System.Windows.Forms.TextBox txtOpenResults;
    private System.Windows.Forms.Label lblSelComPort;
    private System.Windows.Forms.Label lblCommand;
    private System.Windows.Forms.Label lblResponse;
    private System.Windows.Forms.Label lblOpenResults;
    /// <summary>
    /// Required designer variable.
    /// </summary>
    private System.ComponentModel.Container components = null;
```

```
    public Form1()
    {
      //
      // Required for Windows Form Designer support
      //
      InitializeComponent();

      //
      // TODO: Add any constructor code after InitializeComponent call
      //
    }

    /// <summary>
    /// Clean up any resources being used.
    /// </summary>
    protected override void Dispose( bool disposing )
    {
      if( disposing )
      {
        if (components != null)
        {
          components.Dispose();
        }
      }
      base.Dispose( disposing );
    }

    #region Windows Form Designer generated code
    /// <summary>
    /// Required method for Designer support - do not modify
    /// the contents of this method with the code editor.
    /// </summary>
    private void InitializeComponent()
    {
      System.Resources.ResourceManager resources = new
System.Resources.ResourceManager(typeof(Form1));
      this.btnOpen = new System.Windows.Forms.Button();
      this.txtCommand = new System.Windows.Forms.TextBox();
      this.lblCommand = new System.Windows.Forms.Label();
      this.btnSend = new System.Windows.Forms.Button();
      this.lblResponse = new System.Windows.Forms.Label();
      this.txtResponse = new System.Windows.Forms.TextBox();
      this.btnClose = new System.Windows.Forms.Button();
      this.nudComPort = new System.Windows.Forms.NumericUpDown();
      this.lblSelComPort = new System.Windows.Forms.Label();
      this.axMSComm1 = new AxMSCommLib.AxMSComm();
      this.txtOpenResults = new System.Windows.Forms.TextBox();
      this.lblOpenResults = new System.Windows.Forms.Label();
      ((System.ComponentModel.ISupportInitialize)(this.nudComPort)).BeginInit();
      ((System.ComponentModel.ISupportInitialize)(this.axMSComm1)).BeginInit();
      this.SuspendLayout();
      //
      // btnOpen
      //
      this.btnOpen.Location = new System.Drawing.Point(56, 24);
      this.btnOpen.Name = "btnOpen";
      this.btnOpen.Size = new System.Drawing.Size(72, 20);
```

```
this.btnOpen.TabIndex = 0;
this.btnOpen.Text = "&Open Port";
this.btnOpen.Click += new System.EventHandler(this.btnOpen_Click);
//
// txtCommand
//
this.txtCommand.Location = new System.Drawing.Point(8, 136);
this.txtCommand.Name = "txtCommand";
this.txtCommand.Size = new System.Drawing.Size(376, 20);
this.txtCommand.TabIndex = 1;
this.txtCommand.Text = "/read";
//
// lblCommand
//
this.lblCommand.AutoSize = true;
this.lblCommand.Location = new System.Drawing.Point(8, 120);
this.lblCommand.Name = "lblCommand";
this.lblCommand.Size = new System.Drawing.Size(209, 13);
this.lblCommand.TabIndex = 2;
this.lblCommand.Text = "Type command here and then click Send";
this.lblCommand.TextAlign = System.Drawing.ContentAlignment.MiddleRight;
//
// btnSend
//
this.btnSend.Enabled = false;
this.btnSend.Location = new System.Drawing.Point(392, 136);
this.btnSend.Name = "btnSend";
this.btnSend.Size = new System.Drawing.Size(96, 20);
this.btnSend.TabIndex = 3;
this.btnSend.Text = "&Send command";
this.btnSend.Click += new System.EventHandler(this.btnSend_Click);
//
// lblResponse
//
this.lblResponse.AutoSize = true;
this.lblResponse.Location = new System.Drawing.Point(8, 168);
this.lblResponse.Name = "lblResponse";
this.lblResponse.Size = new System.Drawing.Size(131, 13);
this.lblResponse.TabIndex = 4;
this.lblResponse.Text = "Response from the driver";
this.lblResponse.TextAlign = System.Drawing.ContentAlignment.MiddleRight;
//
// txtResponse
//
this.txtResponse.Location = new System.Drawing.Point(8, 181);
this.txtResponse.Multiline = true;
this.txtResponse.Name = "txtResponse";
this.txtResponse.ScrollBars = System.Windows.Forms.ScrollBars.Vertical;
this.txtResponse.Size = new System.Drawing.Size(480, 72);
this.txtResponse.TabIndex = 5;
this.txtResponse.Text = "";
//
// btnClose
//
this.btnClose.Enabled = false;
this.btnClose.Location = new System.Drawing.Point(136, 24);
this.btnClose.Name = "btnClose";
```

```
      this.btnClose.Size = new System.Drawing.Size(80, 20);
      this.btnClose.TabIndex = 6;
      this.btnClose.Text = "&Close Port";
      this.btnClose.Click += new System.EventHandler(this.btnClose_Click);
      //
      // nudComPort
      //
      this.nudComPort.Location = new System.Drawing.Point(16, 24);
      this.nudComPort.Maximum = new System.Decimal(new int[] {
                                                              16,
                                                              0,
                                                              0,
                                                              0});
      this.nudComPort.Minimum = new System.Decimal(new int[] {
                                                              1,
                                                              0,
                                                              0,
                                                              0});
      this.nudComPort.Name = "nudComPort";
      this.nudComPort.Size = new System.Drawing.Size(35, 20);
      this.nudComPort.TabIndex = 8;
      this.nudComPort.Value = new System.Decimal(new int[] {
                                                            1,
                                                            0,
                                                            0,
                                                            0});
      //
      // lblSelComPort
      //
      this.lblSelComPort.AutoSize = true;
      this.lblSelComPort.Location = new System.Drawing.Point(8, 8);
      this.lblSelComPort.Name = "lblSelComPort";
      this.lblSelComPort.Size = new System.Drawing.Size(236, 13);
      this.lblSelComPort.TabIndex = 9;
      this.lblSelComPort.Text = "Select Virtual Comm Port then click Open Port";
      this.lblSelComPort.TextAlign = System.Drawing.ContentAlignment.MiddleRight;
      //
      // axMSComm1
      //
      this.axMSComm1.Enabled = true;
      this.axMSComm1.Location = new System.Drawing.Point(448, 8);
      this.axMSComm1.Name = "axMSComm1";
      this.axMSComm1.OcxState =
((System.Windows.Forms.AxHost.State)(resources.GetObject("axMSComm1.OcxState")));
      this.axMSComm1.Size = new System.Drawing.Size(38, 38);
      this.axMSComm1.TabIndex = 10;
      this.axMSComm1.OnComm += new System.EventHandler(this.axMSComm1_OnComm);
      //
      // txtOpenResults
      //
      this.txtOpenResults.Location = new System.Drawing.Point(8, 77);
      this.txtOpenResults.Name = "txtOpenResults";
      this.txtOpenResults.Size = new System.Drawing.Size(272, 20);
      this.txtOpenResults.TabIndex = 11;
      this.txtOpenResults.Text = "";
      //
      // lblOpenResults
```

```
    //
    this.lblOpenResults.AutoSize = true;
    this.lblOpenResults.Location = new System.Drawing.Point(8, 64);
    this.lblOpenResults.Name = "lblOpenResults";
    this.lblOpenResults.Size = new System.Drawing.Size(68, 13);
    this.lblOpenResults.TabIndex = 12;
    this.lblOpenResults.Text = "Open results";
    //
    // Form1
    //
    this.AutoScaleBaseSize = new System.Drawing.Size(5, 13);
    this.ClientSize = new System.Drawing.Size(496, 267);
    this.Controls.AddRange(new System.Windows.Forms.Control[] {
                            this.lblOpenResults,
                            this.txtOpenResults,
                            this.axMSComm1,
                            this.lblSelComPort,
                            this.nudComPort,
                            this.btnClose,
                            this.txtResponse,
                            this.lblResponse,
                            this.btnSend,
                            this.lblCommand,
                            this.txtCommand,
                            this.btnOpen});
    this.Name = "Form1";
    this.Text = "Form1";
    ((System.ComponentModel.ISupportInitialize)(this.nudComPort)).EndInit();
    ((System.ComponentModel.ISupportInitialize)(this.axMSComm1)).EndInit();
    this.ResumeLayout(false);
}
#endregion
/// <summary>
/// The main entry point for the application.
/// </summary>
[STAThread]
static void Main()
{
    Application.Run(new Form1());
}
//
// Open the comm (MTD) port
//
private void btnOpen_Click(object sender, System.EventArgs e)
{
    if(axMSComm1.PortOpen)
    {
      axMSComm1.PortOpen = false;
    }
    axMSComm1.CommPort = (short)nudComPort.Value;

    // not needed for MTD but set to some valid value
    axMSComm1.Settings = "9600,E,7,1";

    // enable the OnComm receive
    axMSComm1.RThreshold = 1;
```

```
      axMSComm1.PortOpen = true;
      if(!axMSComm1.PortOpen)
      {
        txtOpenResults.Text="Port failed to open";
        return;
      }
      else
      {
        txtOpenResults.Text="Port opened " + axMSComm1.CommPort;
      }
      btnSend.Enabled=true;
      btnOpen.Enabled=false;
      btnClose.Enabled=true;
    }
    //
    // Close the comm (MTD) port
    //
    private void btnClose_Click(object sender, System.EventArgs e)
    {
      if(axMSComm1.PortOpen)
      {
        axMSComm1.PortOpen = false;
      }
      txtOpenResults.Text="Port closed";
      btnClose.Enabled = false;
      btnSend.Enabled = false;
      btnOpen.Enabled = true;
    }
    //
    // Send current command
    //
    private void btnSend_Click(object sender, System.EventArgs e)
    {
      txtResponse.Text = "";
      if(axMSComm1.PortOpen)
      {
        axMSComm1.Output = txtCommand.Text + "\n";
      }
    }
    //
    // Capture the data from the MTD driver
    //
    private void axMSComm1_OnComm(object sender, System.EventArgs e)
    {
      switch(axMSComm1.CommEvent)
      {
        // event #2 is the receive event
        case 2:
        {
          txtResponse.Text += axMSComm1.Input.ToString();
          break;
        }
      }
    }
  }
}
```

C EXAMPLE

```
#include <stdio.h>
#include <windows.h>
#define BUF_LEN 256
#define COMM_TIMEOUT 5000

//-----------------------------------------------------------------------------
BOOL  OpenMTD(PHANDLE phMTD);
BOOL  CloseMTD(PHANDLE phMTD);
BOOL  WriteMTD(PHANDLE phMTD, LPTSTR lpParam,DWORD *lpdwWritten);
BOOL  ReadMTD(PHANDLE phMTD, LPTSTR lpParam,DWORD pdwReadSize,DWORD *lpdwRead);

//-----------------------------------------------------------------------------
BOOL  OpenMTD(PHANDLE phMTD)
{
    *phMTD = CreateFile("\\\\.\\COM9" , GENERIC_READ | GENERIC_WRITE, 0, NULL,   OPEN_EXISTING,
    FILE_FLAG_OVERLAPPED, NULL);
        if (*phMTD!= INVALID_HANDLE_VALUE)
        {
                        DCB dcb;
                        if (!GetCommState(*phMTD, &dcb))
                        {
                                return FALSE;
                        }

                        //Setup the baud rate
                        dcb.BaudRate = CBR_9600;
                        dcb.Parity = EVENPARITY;

                        //Setup the data bits
                        dcb.ByteSize = 7;
                        dcb.StopBits = ONESTOPBIT;

                        //Setup the flow control
                        dcb.fDsrSensitivity = FALSE;
                        dcb.fOutxCtsFlow = FALSE;
                        dcb.fOutxDsrFlow = FALSE;
                        dcb.fOutX = FALSE;
                        dcb.fInX = FALSE;

                        //Now that we have all the settings in place, make the changes
                        if (!SetCommState(*phMTD, &dcb))
                        {
                                return FALSE;
                        }
                return TRUE;
        }

  return FALSE;

}
//-----------------------------------------------------------------------------
BOOL  CloseMTD(PHANDLE phMTD)
{
        if (*phMTD!= INVALID_HANDLE_VALUE)
        {
                CloseHandle(*phMTD);
                return TRUE;
        }
        return FALSE;

}

//-----------------------------------------------------------------------------
BOOL  WriteMTD(PHANDLE phMTD, LPTSTR lpParam,DWORD *lpdwWritten)
{
        if (phMTD== INVALID_HANDLE_VALUE)
        {
                return FALSE;
        }
```

```
        HANDLE oev_write = CreateEvent(NULL,TRUE,FALSE,NULL);
        OVERLAPPED ov_write;
        DWORD dwWriteStatus=0;
        ZeroMemory(&ov_write, sizeof(OVERLAPPED));
        ov_write.hEvent = oev_write;
        DWORD dwLen = strlen(lpParam);
        BOOL bDone=FALSE;

        while (!bDone)
        {
               if(!WriteFile(*phMTD, lpParam,dwLen,lpdwWritten,&ov_write))
               {
                      dwWriteStatus = WaitForSingleObject (ov_write.hEvent,COMM_TIMEOUT);
                      switch(dwWriteStatus)
                      {
                         case WAIT_OBJECT_0:
                                {
                                GetOverlappedResult(phMTD,&ov_write, lpdwWritten, TRUE);
                                bDone=TRUE;
                                }
                         break;
                         default:
                                {
                                     //No data was writted to the serial port
                                     return FALSE;
                                }
                      };
               }
               bDone=TRUE;
        }
        return TRUE;

}
//---------------------------------------------------------------------------
BOOL  ReadMTD(PHANDLE phMTD, LPTSTR lpParam,DWORD pdwReadSize,DWORD *lpdwRead)
{
        if (phMTD==INVALID_HANDLE_VALUE)
        {
          return FALSE;
        }
        BOOL bDone=FALSE;
        HANDLE oev_read = CreateEvent(NULL,TRUE,FALSE,NULL);
        OVERLAPPED ov_read;
        DWORD dwReadStatus=0;
        ZeroMemory(&ov_read, sizeof(OVERLAPPED));
        ov_read.hEvent = oev_read;

        while(!bDone)
        {
           if(!ReadFile(*phMTD, lpParam, pdwReadSize,lpdwRead, &ov_read))
           {
             dwReadStatus = WaitForSingleObject (ov_read.hEvent, COMM_TIMEOUT);
                 switch(dwReadStatus)
                      {
                       case WAIT_OBJECT_0:
                         {
                              GetOverlappedResult(phMTD,&ov_read, lpdwRead, FALSE);
                              bDone=TRUE;
                         }
                       break;
                       default:
                         {
                              //No data was read from the serial port
                              return FALSE;
                         }
                      };
           }
           bDone=TRUE;
        }
        return TRUE;
}
```

```
int main(int argc, char* argv[])
{
	HANDLE hMTD;
	OpenMTD(&hMTD);
	char sBuffer[BUF_LEN]="";
	DWORD dwLenRet=0;
	WriteMTD(&hMTD,"/rawxact 44\r\n",&dwLenRet);
	ReadMTD(&hMTD,sBuffer,BUF_LEN,&dwLenRet);
	printf("%s\n",sBuffer);
	CloseMTD(&hMTD);
	return 0;
}
```

POWER BUILDER EXAMPLE

The following example illustrates how to set up PowerBuilder (from Sybase) to read magnetic data from the IntelliPIN device. Since PowerBuilder does not interface to a serial port very easily, a third-party OCX is required. The first part of this application note shows how to load an ActiveX component. The main program script shows how to interface with the OCX, the MTD Windows Driver, and the MagTek device (in this case the IntelliPIN).

The following communication ActiveX components are available for use with PowerBuilder:

Product	Company	Web Site	Phone
IO ActiveX Control	Software Island	members.aol.com/easyio	N/A
Comm Library	EllTech	elltech.com	800-227-8047
COMM-DRV/LIB	WCSC	www.wcscnet.com	800-966-4832

In our example, we have chosen “IO ActiveX Control” from Software Island. Here is a method that can be used to install this component:

1. In a PowerBuilder application, open a new window.
2. From the “Controls” dropdown menu, select “OLE”.
3. From the “Create New” tab, select the intended OCX, for example, “IO Control”. (It is assumed that the OCX has already been registered by installing it according to the manufacturer’s directions.) Then click “OK”.
4. Left click anywhere on the open window and drop the component onto it.
5. Right click on the newly installed component and select “Properties”. Enter “mtd” into the “Name” text field. Enter “MTD OCX” into the “Display Name” and “Tag” text fields. Click “OK”.
6. Right click anywhere on the window outside the new component then select “Properties”. Enter “ole_io” into the “Title:” text field. Deselect the “Visible” check-off box so the window will not be shown then click “OK”.
7. Right click anywhere on the window outside the new component then select the “Script” option. Insert the following script into the “ole_io” window.

```
////////////////////////////////////////////////////
//    Window Script to load OCX for Mag-Tek Driver.     //
//    This is the script for the invisible window that  //
//    contains the OLE object.                          //
////////////////////////////////////////////////////
integer result

result = mtd.object.Open("COM5:", "")
// COM5 is the virtual port name which was automatically
// assigned to IntelliPIN RS-232 Driver upon installation.
// It may be different for your installation.

if result < 1 then
   MessageBox("Open Read",result)
   return 0
END if
```

8. Close the PowerScript Painter window and answer “Yes” to “Save changes…”.
9. Close the Window Painter window and answer “Yes” to “Save changes…”. At the “Save Window” dialog box, enter “ole_io” then click “OK”.
10. Open the PowerScript window for the main application and integrate the following commands into the application. (This demo application prompts the user to read a card. The program will continue to loop until the “Cancel” button is pushed.)

```
////////////////////////////////////////////////////////////
//    Application to demonstrate use of OLE ActiveX Component  //
//    to interface to Mag-Tek Windows Drivers (MTD).           //
////////////////////////////////////////////////////////////
string response
integer result

// Open ActiveX frame window to load the ole_io control.
// This may take a few seconds while the port is opened.
Open (ole_io)

// Include any commands required for your application.

// Specify the number of seconds to wait for card to be read
ole_io.mtd.object.SetTimeOut(120)
// Define the message to be shown on the IntelliPIN to read a card.
// The end of line (~n) must be inserted for driver commands.
ole_io.mtd.object.WriteString("/set msg1 Read a Card~n")

NextCard:
// Request the card to be read.
ole_io.mtd.object.WriteString("/read card~n")
// Wait for the card to be swiped.
response = ole_io.mtd.object.ReadString(250)
// See if the card was read.
if response <> "" then
    // Remove “PIN Pad is processing” Display from IntelliPIN
       ole_io.mtd.object.WriteString("/display Thank You~n")
    // Show the card data in a Message window.
          result = MessageBox("Read Card?",response,Exclamation!,OKCancel!)
       else
    // It was a timeout from the OCX.
    // Must cancel the active command if the read was not performed.
       result = ole_io.mtd.object.WriteString("/cancel read~n")
    //ignore the response to cancel
       response = ole_io.mtd.object.ReadString(50)
end if
if result = 1 then
    goto NextCard
end if
```

APPENDIX A. INSTALLATION AND SETUP

The distribution CD contains the MTD Driver files for many of the MagTek products. When the files are acquired from the Internet, unzip the files into an installation directory (DISK1) and run the setup from that location. In addition to the drivers, there are many files that are required to support the installation and operation of these drivers. The CD will normally auto-run; if it does not, select ***RUN*** from the Start menu and type: **D:\setup** (where "D" designates the location of the CD or its image).

Some of the Drivers support multiple configurations of the associated product. For example, the IntelliPIN Driver (IPIN.VXD) provides an interface vehicle for three different interface configurations. When a Driver is installed, be sure to select the proper interface type for your installation.

Note

When operating Windows NT, 2000, or XP, only users with administrator privileges may install system components. You must log on as an administrator (or as a user with full administrator privileges) before attempting to install the MTD drivers.

After installing a driver, you will be given the option of adjusting the **Port Name** (virtual port) and the **Connect to** (physical port) values. The **Port Name** is the COMxx port by which the device will be addressed. The **Connect to** is the port that the device is physically attached to on the PC.

Note

It is important to remove the previous version of MTD and re-boot the system before installing this version of the MTD Driver. The installation script provided cannot upgrade MTD from versions prior to versions 1.12. Refer to the section "Removing old MTD Versions" at the end of this appendix.

General Notes:

1. The computer and device should be powered off when connecting any devices.
2. Although you do not have to have the device connected to install the driver, it is highly recommended. This allows the device and driver to be tested when the driver is installed.
3. Note which hardware port each device is using on the computer as this information will be used later in the driver installation process.

Installing USB HID Devices on Windows 2000 and XP

Note

Do not attach the USB HID Swipe reader until the MTD Disk image has been created and the MTD Drivers have been installed. During installation of the MTD Drivers, select ***Port-Powered Swipe Reader;*** *it will be used to communicate with the USB HID Swipe reader.*

After the disk image has been created and the MTD Drivers have been installed, follow the steps below to install the USB driver:

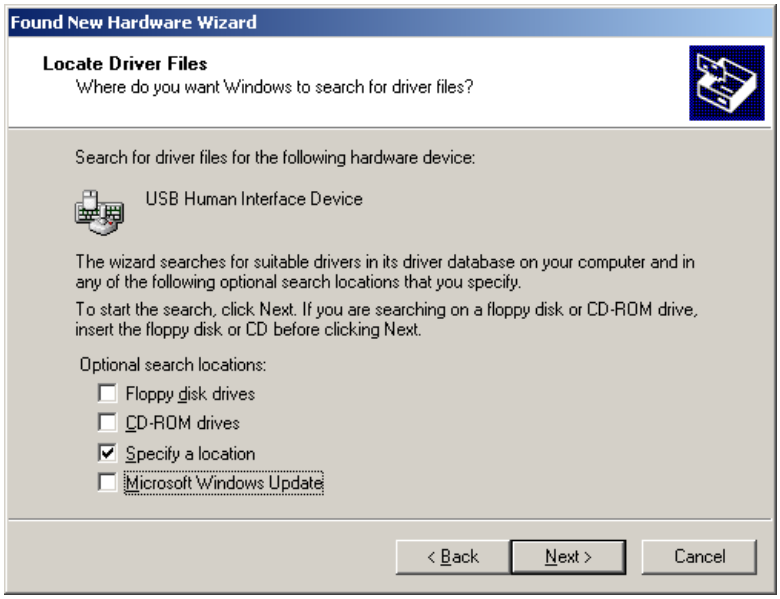
1. Navigate to **C:\DISK1\USB HID** folder.

2. Run **SaveHID.BAT** from that folder.

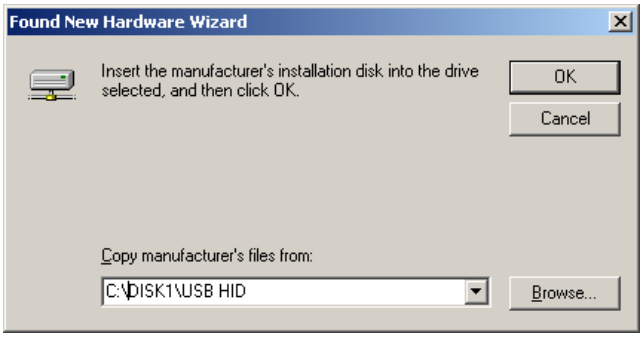
3. Plug in the USB HID Swipe Reader.

4. Click ***Next.***

5. Select *Search for a suitable driver…* and click Next.

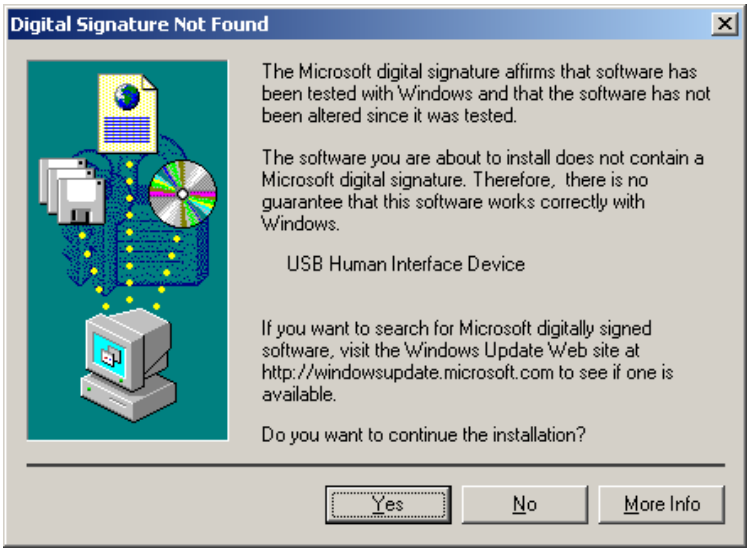


6. Check *Specify a location* then click Next.



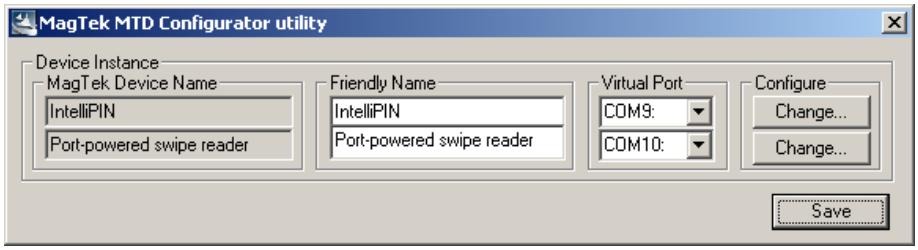
7. Enter the location of the USB HID folder and click OK. At the next screen, click ***Next***.

8. When the driver is being copied, Windows will indicate that the Digital Signature is not found.

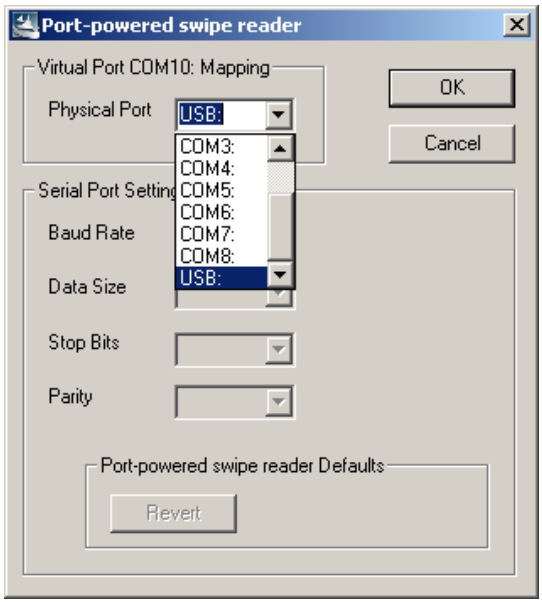


9. Answer ***Yes,***. then complete the next sequence of dialog boxes as you did above. Wait for *TI UMP Port* add hardware wizard and repeat from step 4.

10. After the driver has been installed, run ISConfigDlgMFC.exe (found in C:\Program Files\MagTek\MTDInstall).



11. Click the ***Change*** button next to the Port Powered Swipe Reader entry.



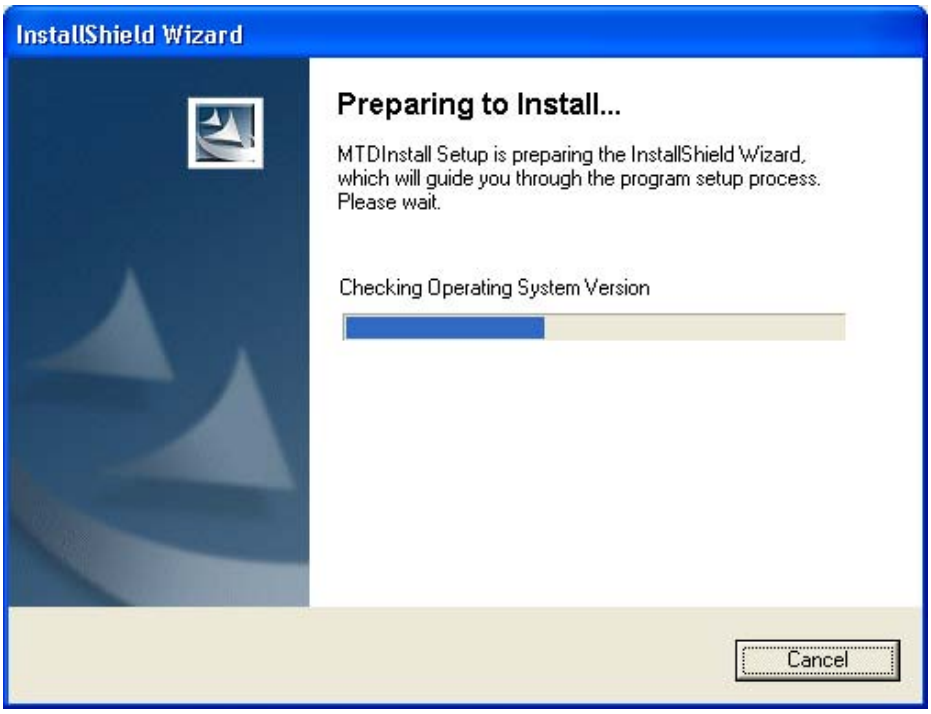
12. Select *USB* as the *Physical Port* then click ***OK***.

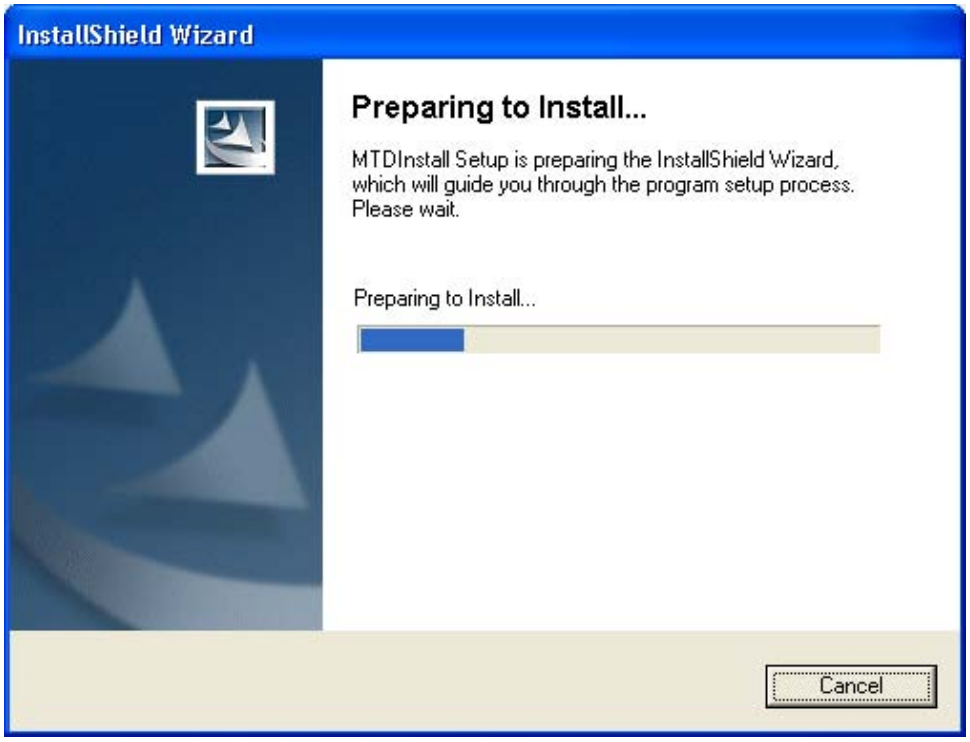
13. The USB HID Swipe Reader will now be available to the MTD application on the virtual port number identified in step 11 above.

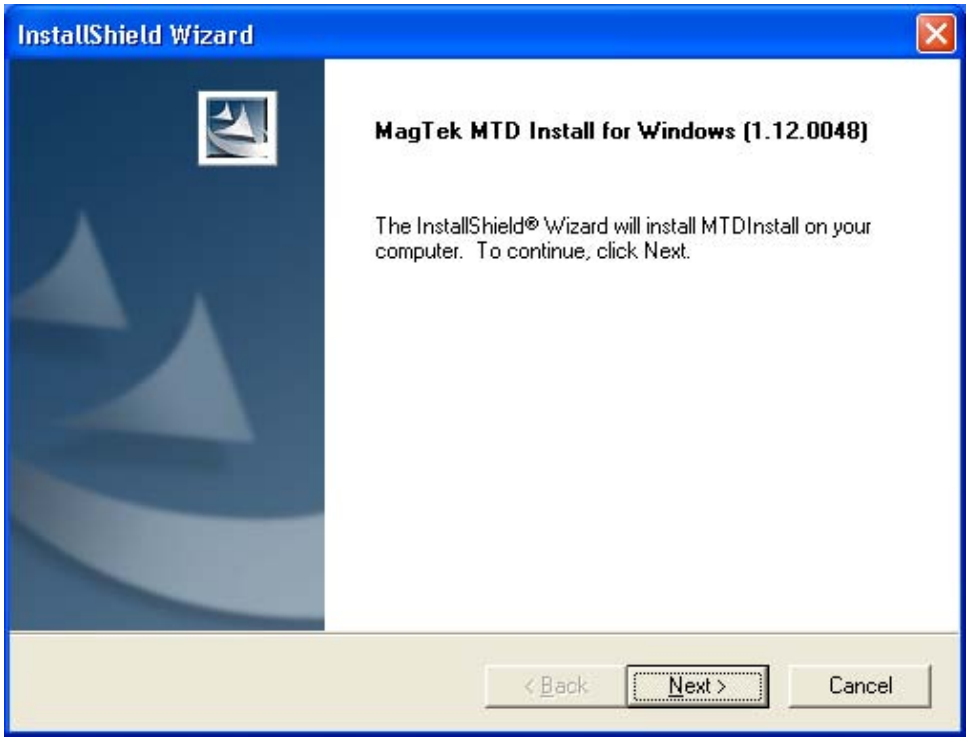
Installing MTD Drivers

The MTD Drivers can be easily installed on any supported Windows operating system simply by running the ***setup*** program on the installation disk.

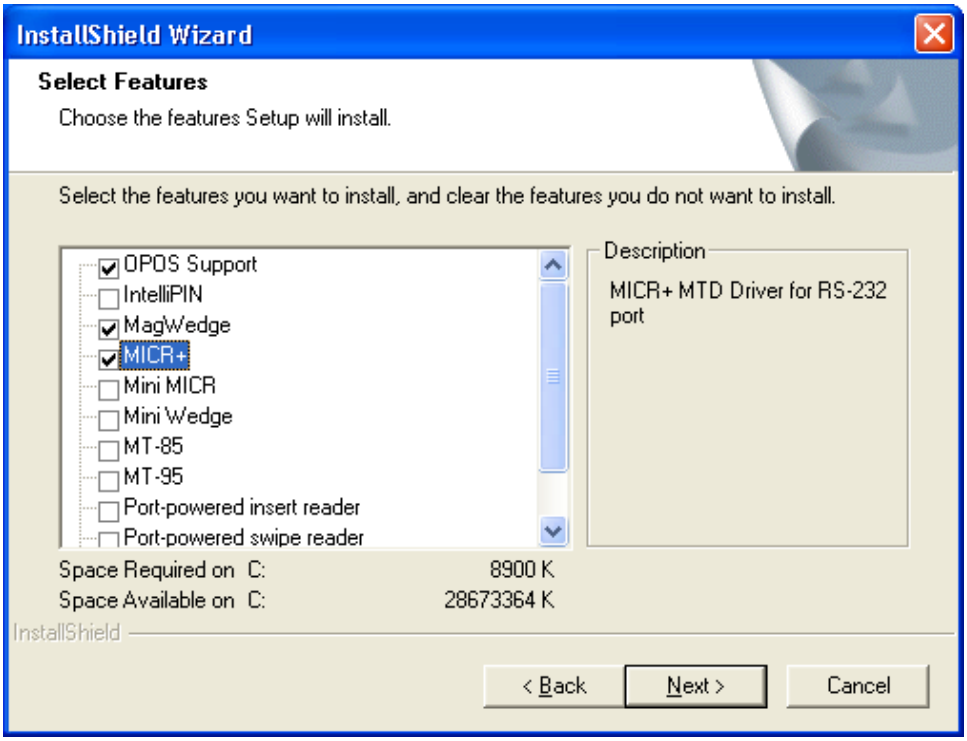
After the installation begins, follow the instructions on the screen.



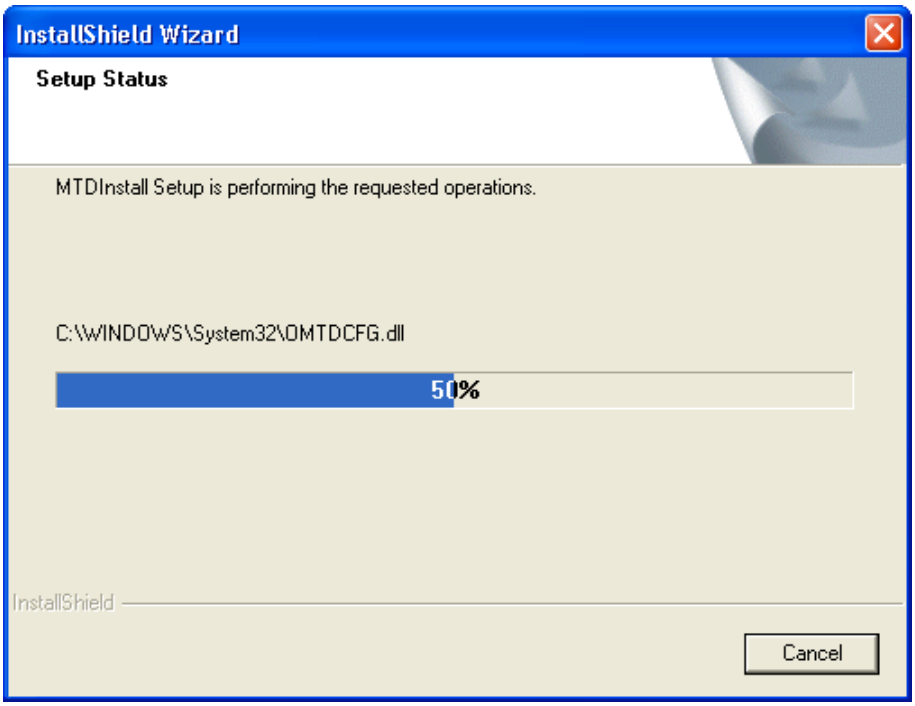




Use the next window to select the MagTek devices that will be used. If you do not plan to use OPOS, you can deselect this box. Be sure to click on the box for each MTD drivers to be installed.



After all required drivers have been selected, click ***Next***.

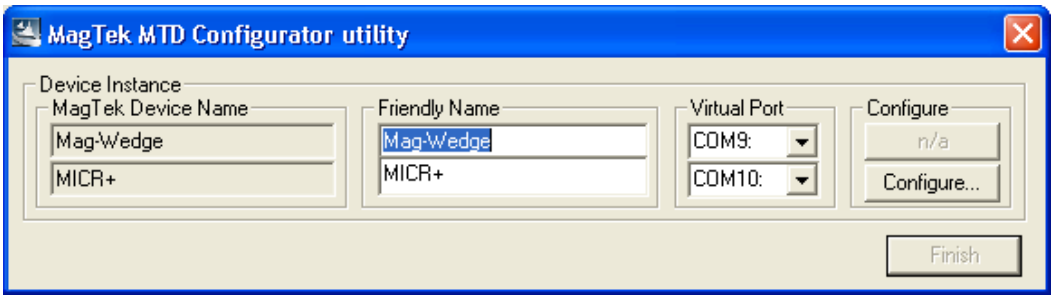


After the necessary files have been copied, you will be requested to indicate the physical and logical configuration. This process is slightly different on different version of Windows.

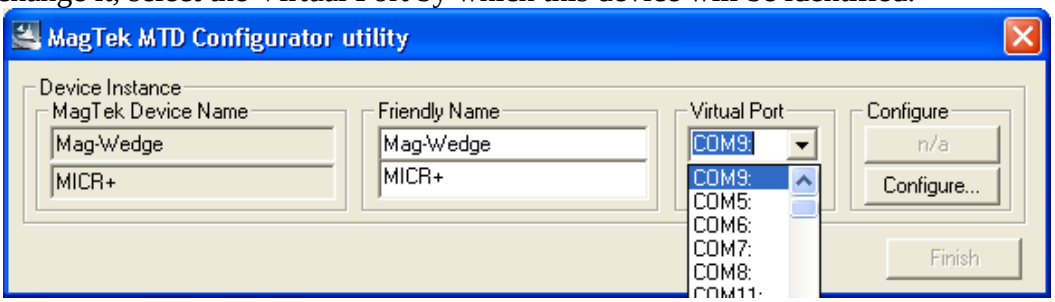
If using Windows 98 or ME, skip to section *Installing on Windows 98 and ME* below.

Installing on Windows NT, 2000 and XP

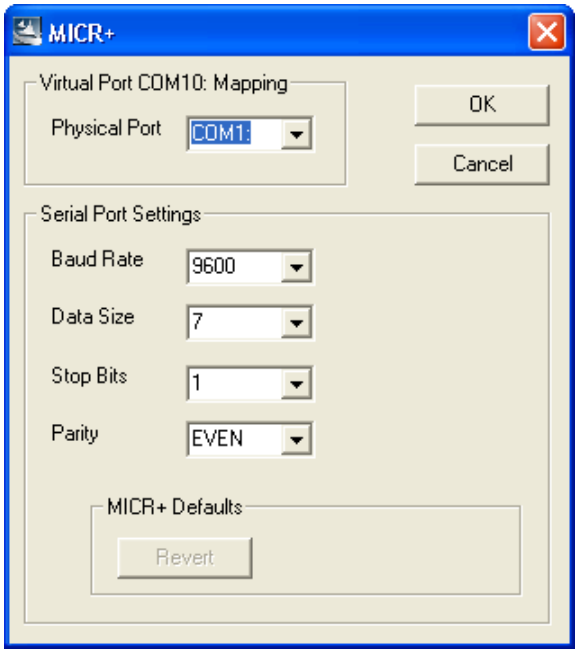
With Window NT, 2000, and XP, you will use the MTD Configurator to set the device properties. You will have to select a virtual port for each device that has been installed. Each RS-232 serial device will have to be configured but keyboard wedge devices do not have to be configured.



You can either accept the default friendly name, or you can modify it to match your system requirements. Usually your application can use the Virtual Port that is automatically assigned by the system. However, if you need to change it, select the Virtual Port by which this device will be identified.

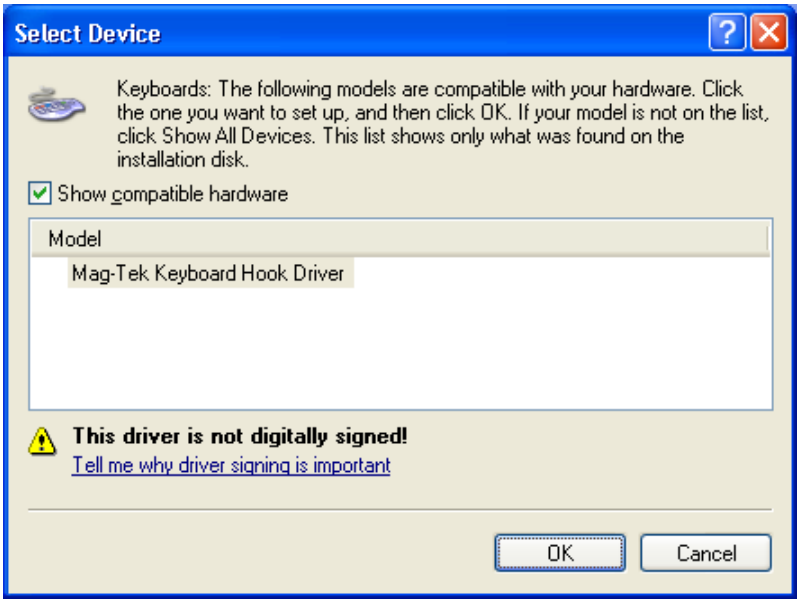


Then click the ***Configure…*** button to define the communication parameters for each serial (RS-232) or USB device.

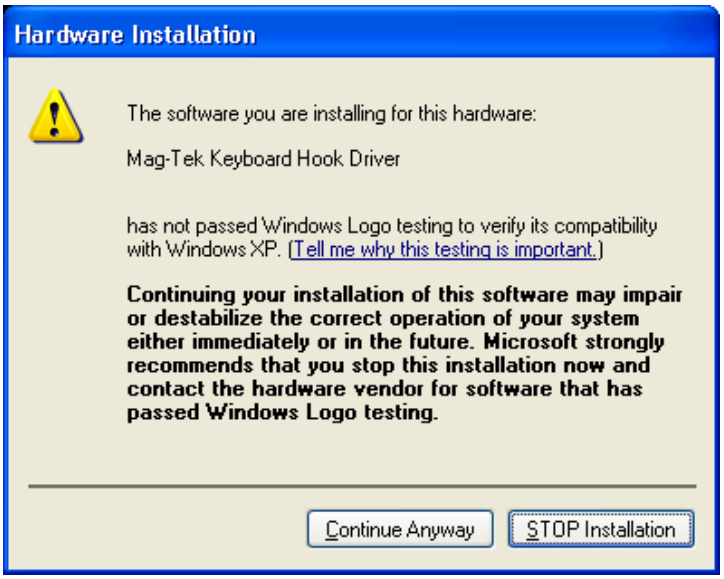


Click ***Finish*** after all device instances have been configured.

After the devices have been configured, the installation program will complete the process by copying the appropriate files and configuring the system. If you have installed a keyboard wedge device, the Keyboard Hook Driver will have to be installed. Windows 2000 and XP try to ensure that certain drivers have been authorized for installation. The following screen indicates that the MagTek driver is unknown and not validated with a digital signature. MagTek does not yet have a digital signature but, from all the testing we have performed, this Keyboard Hook Driver meets all of the Windows requirements. Click ***OK*** to proceed.



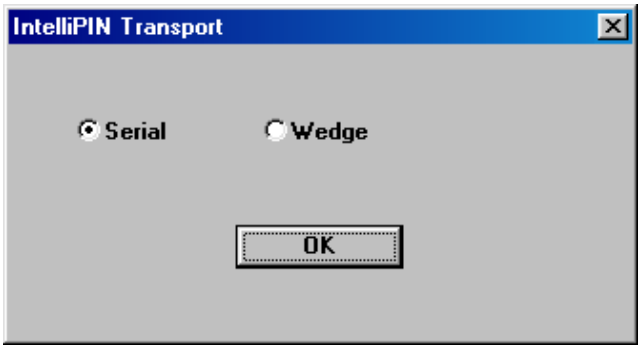
Then click ***Continue Anyway*** to complete the installation.



Go to the *Completing the Installation* below.

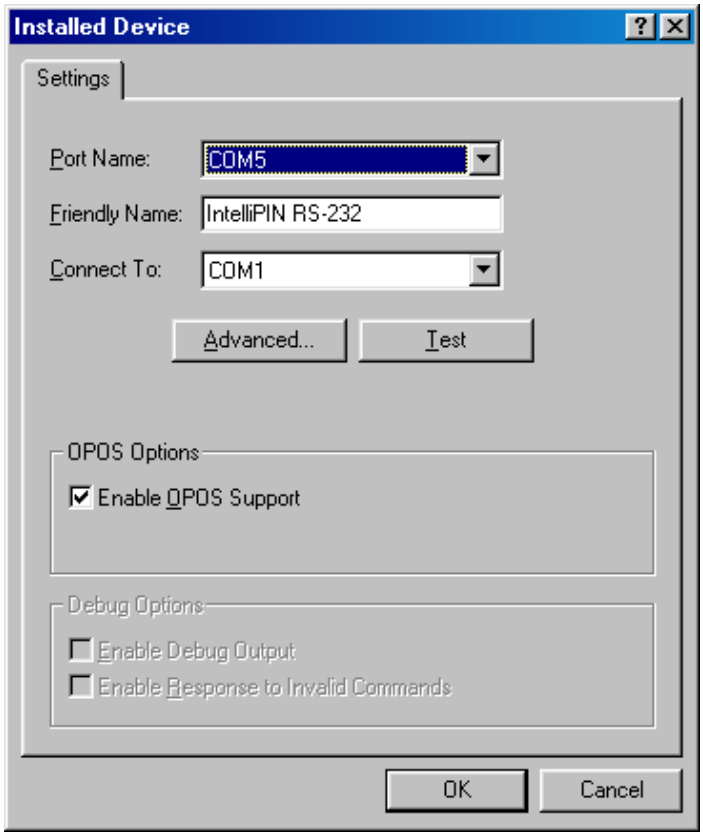
Installing on Windows 98 and ME

For Window 98 and ME, you will be presented with a properties box for each device. For the IntelliPIN and other devices that can be installed using different interfaces, you will be asked to identify the physical connection:

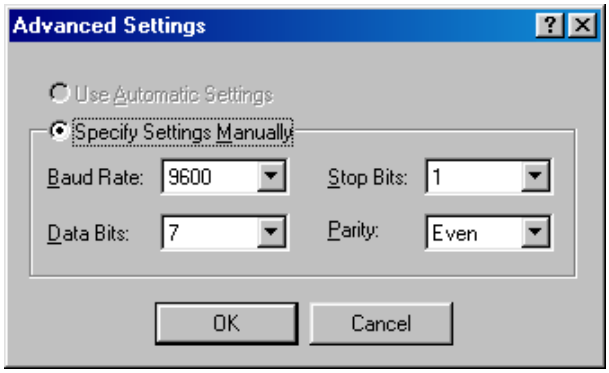


Click ***OK*** after selecting the correct transport.

The device properties box for each device will pop up.



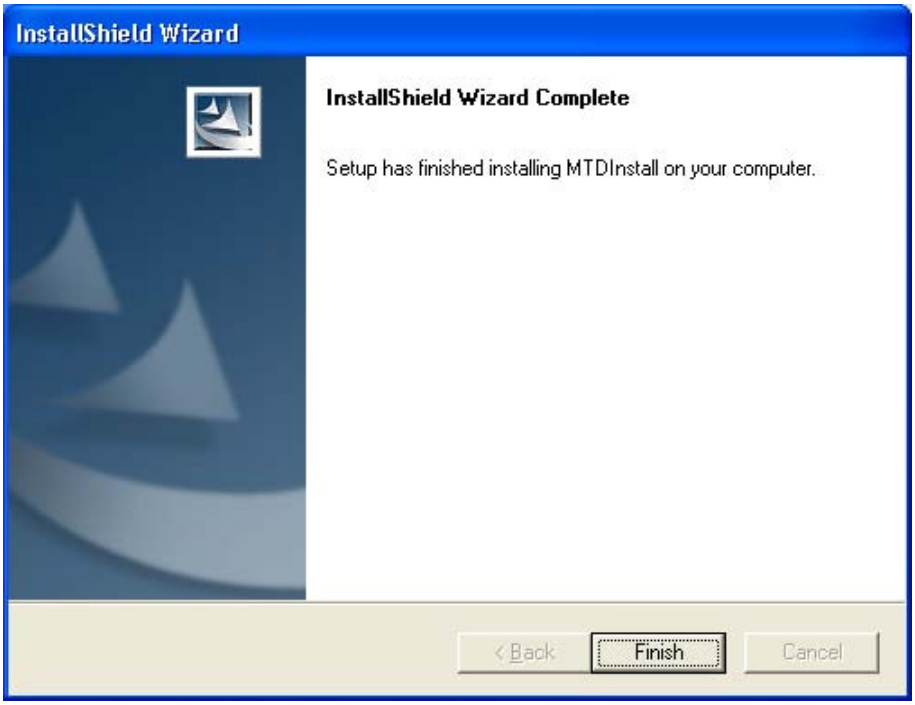
You will need to define the Port Name (virtual port) for each device. Unless you have a reason to select a specific COM port, you can usually leave the default value. Change the friendly name if necessary and specify the physical port to which the device is connected. In some cases, you may need to modify the communication settings; if so, click the ***Advanced…*** button.



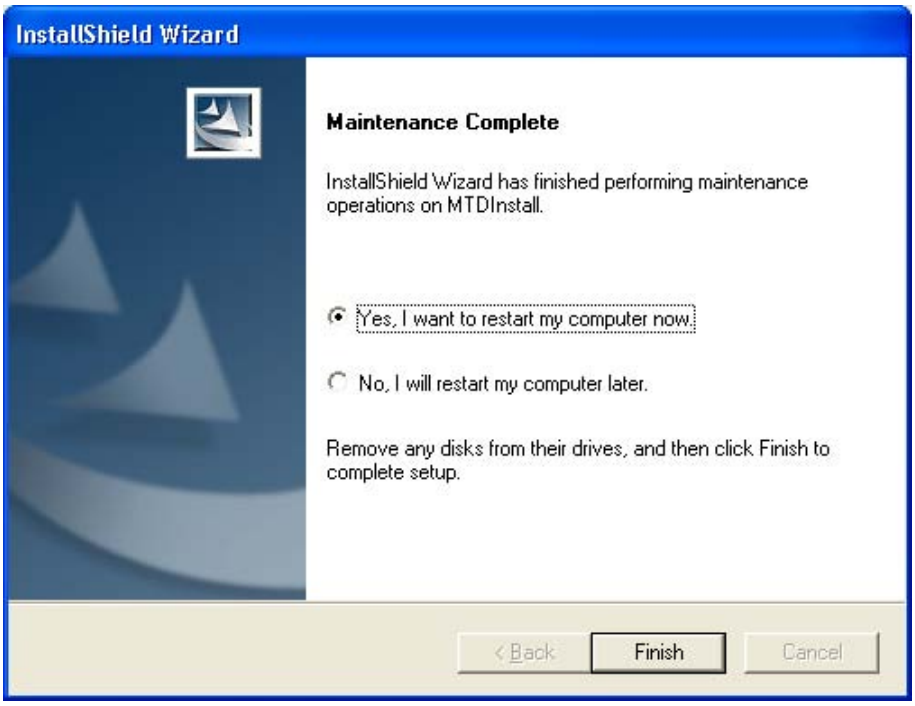
After all of the settings have been verified, click ***OK***. You can then use the ***Test*** button to confirm that the device has been installed properly and is operating correctly. If the device is not connected, you can bypass this step.

Completing the Installation

All the files have been copied and all of the settings have been confirmed. Click ***Finish***.



Since some registry entries have been modified and some drivers may have to be installed, you will have to reboot your computer to complete the installation process. Be sure to close all other applications before restarting your computer. When you are ready, click ***Finish***. If you want to restart your computer later, be aware that the MTD drivers cannot be used until the computer is restarted.

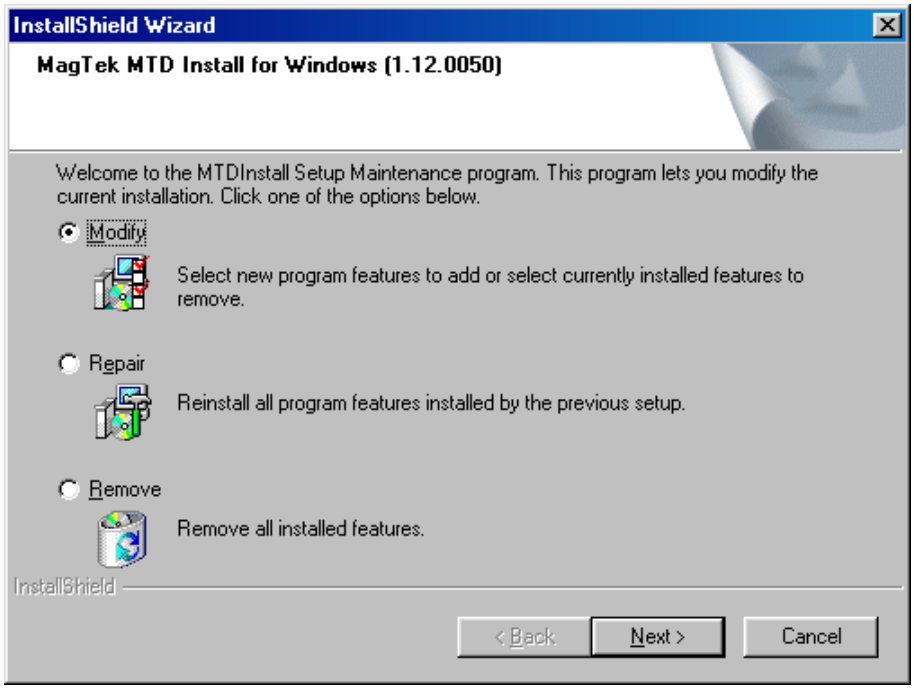


When the computer restarts, you will be able to use any application that communicates with the MTD drivers.

Modifying MTD Driver Installation

If you need to add a new device or modify one of the existing devices, you may run the ***setup*** program from your original location or you can go to the control panel and use the *Add/Remove Programs* applet. If you choose the latter approach, select *MagTek Device Drivers (MTD)* and click ***Add/Remove***. The InstallShield Wizard will be loaded so you can choose to *Modify* the existing installation.

At this point, you also have the options to *Repair* or *Remove* the MTD drivers. The *Repair* function will ensure that all files on your disk are updated to the current configuration levels. The *Remove* selection will allow you to remove all of the driver files from your PC.



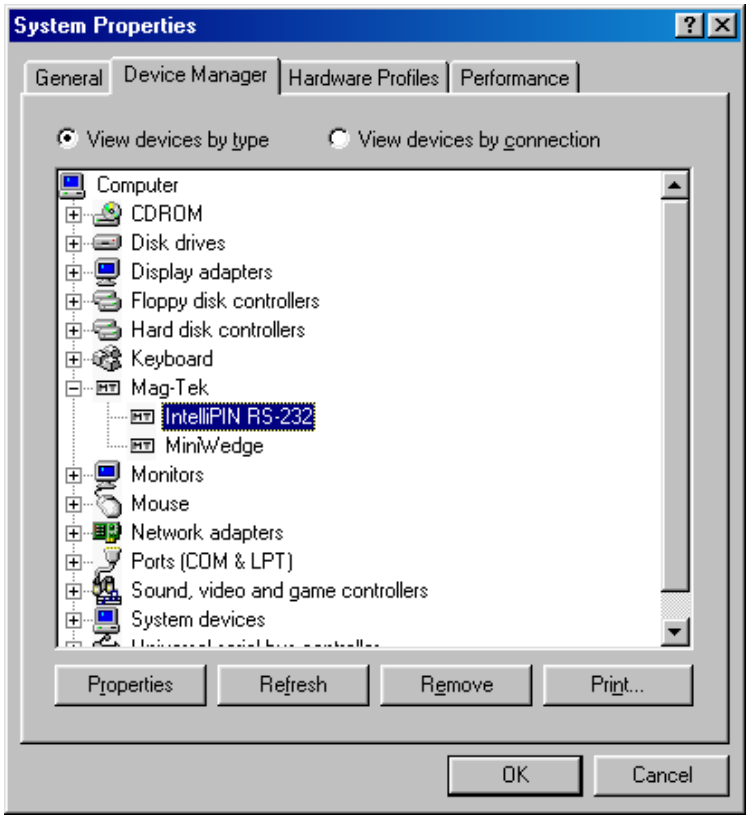
If you select *Modify* then click ***Next***, you will be presented with the same selections you had when you initially installed the MTD Drivers. At this point, you can either choose to uncheck any existing devices (effectively removing that driver) or to add new ones.

Modifying a Device Driver's Settings

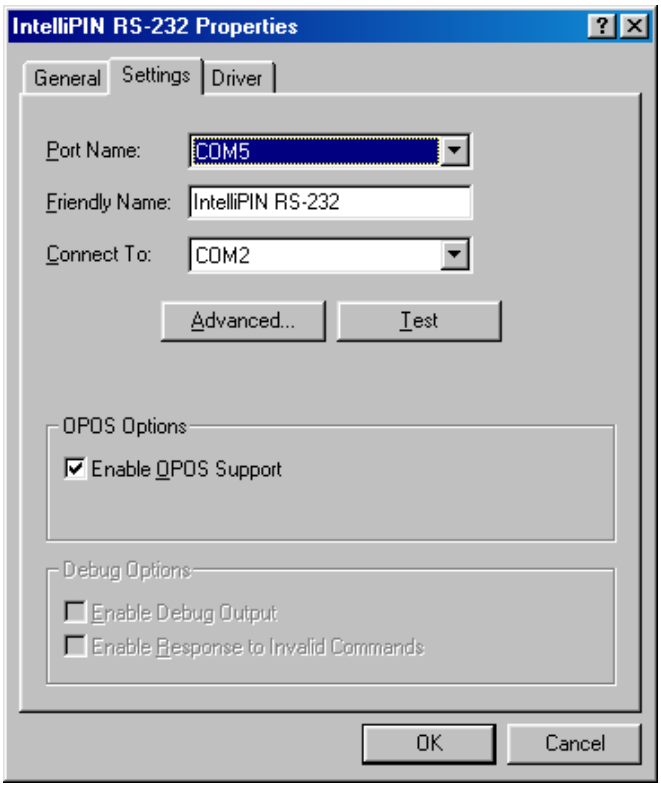
If you do not need to add or remove one of the device drivers but wish to modify one of the device's configuration parameters, you do not have to go back to the original installation disk.

Modifying Device Settings in Windows 98/ME
To modify the device driver's settings, perform the following steps:

1. Right-click on **My Computer** on the desktop or open the Control Panel and double click on the **System** icon then select **Properties**.
2. Select the **Device Manager** tab.
3. Expand the **MagTek** class by clicking the plus sign. Find the required device under the **MagTek** class then click on **Properties**.

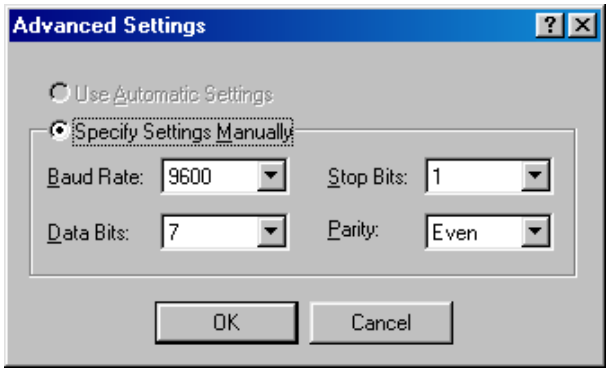


4. Select the **Settings** tab to view the driver configuration. **Port Name** indicates the virtual port number and **Connect to** indicates the physical port.



5. Click the **Advanced** button to view the communication settings. Some devices (e.g., MICR+) support automatic settings, which allow the driver to determine the present setup of the device. If

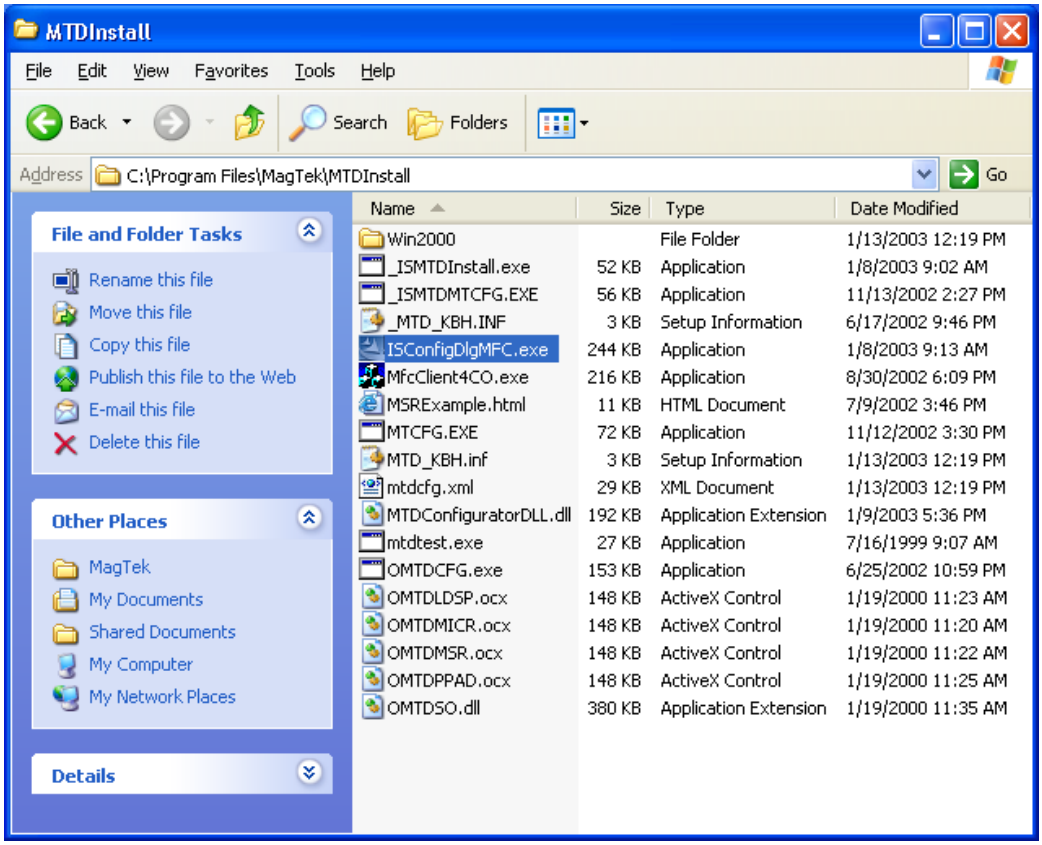
required, click the **Specify settings manually** radio button and modify the communication setup. Click **OK** when done.



Modifying Device Settings in Windows NT/2000/XP

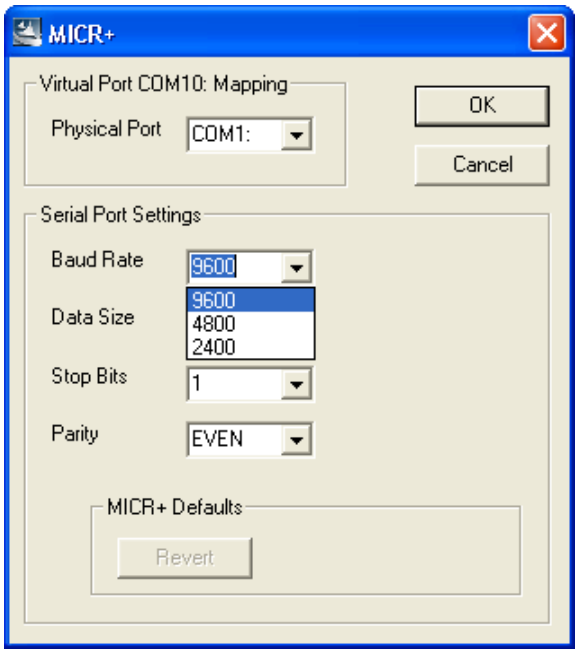
If you do not need to add or remove one of the device drivers but wish to modify one of the device's configuration parameters, you do not have to go back to the original installation disk. You can use the Configurator program that you used during the installation of the drivers.

In order to run the program, navigate to the C:\Program Files\MagTek\MTDInstall folder. Double click on ISConfigDlgMFC.exe as shown below.



This will bring up the Configurator showing all of the installed devices. You can make changes to any of the parameters as required. For example, if you need to change the Virtual Port number, use the pull down to modify the setting.

If you need to change one of the communication settings on a serial device, click the ***Configure…*** button.



Now you can change any of the settings as required. Click ***OK*** when all settings are correct. Then click ***Finish*** in the main dialog box. The settings will be modified in the driver. You do not have to reboot after making these changes.

AUTOMATING MTD DRIVER INSTALLATION

In order to automate MTD driver installation, pre-select the Magtek device(s) in the text file MTDINST.INI. This file is provided on the installation CD. If no devices are selected in this MTDINST.INI file then installation runs in normal mode. This is the default setting from the factory.

Pre-selecting The Device(s):

There is a section "INSTALL" in the mtdinst.ini file. This section lists all the devices. One or more devices can be installed simultaneously. To install a device, set desired device to 1 under the "INSTALL" section. By default all the devices are de-selected so the all the devices are set to 0. MTDINST.INI sample in on page 86.

There is a section named after each device in this file. This section contains the device settings for that device. For each selected device under the "INSTALL" section, the device settings must be modified. Only one section per device name is allowed. For a RS-232 device, change the PortName, UsePort, Baud, datasize, stopbits, and parity. For a WEDGE and a USB device, change the PortName and UsePort.

PortName is the virtual COM port. Each device selected will need a separate virtual COM port. This COM port must not by used by any other application. The MTD drivers will assign this COM port to the device.

UsePort is the physical COM port where the RS-232 device is attached. For a wedge device you must set this value to "KB:". For a USB device you must set this value to "USB:"

baud is the baud rate of the RS-232 device. This value is not used by Wedge and USB device.

datasize is the data bits of the RS-232 device. This value is not used by Wedge and USB device.

stopbits is the stop bits of the device. This value is not used by Wedge and USB device.

parity is the parity of the RS-232 device. This value is not used by Wedge and USB device.

Reboot:

The system must be rebooted after the MTD driver installation. Set "ForceReboot" under the "INSTALL" section to 1 to reboot the system automatically. Set "ForceReboot" under the "INSTALL" section to 0 to disable the reboot process. If you decide to disable the reboot then you must reboot the system before using the MTD drivers.

Installing OPOS:

To install OPOS, change the OPOS value to 1 under the "INSTALL" section. By default it is set to 0.

Installing Generic Driver:

The Generic driver supports RS-232 device and wedge devices. Set "Generic" to 1 under the "INSTALL" section. By default Generic is set to 0. If you have selected to install the generic driver then change the device settings under the "Generic" section.

If you want the generic driver for an RS-232 device then change the value of PortName, UsePort, baud, datasize, stopbits, and parity under the "Generic" section.

Example:
[Generic]
DEVICE= Generic
FriendlyName= Generic
PortName=COM8:
UsePort=COM1:
baud=9600
datasize=7
stopbits=1
parity=EVEN

If you want the generic driver for an wedge device then change PortName, UsePort. Set the UsePort to "KB:"

Example:
[Generic]
DEVICE= Generic
FriendlyName= Generic
PortName=COM8:
UsePort=KB:

Installing IntelliPIN:

Set :IntelliPIN" to 1 under the "INSTALL" section. If you have selected to install the IntelliPIN driver then change the device settings under the "IntelliPIN" section.

If the IntelliPIN is a RS-232 device then change the value of PortName, UsePort, baud, datasize, stopbits, and parity.

Example:
[IntelliPIN]
DEVICE=IntelliPIN
FriendlyName=IntelliPIN
PortName=COM8:
UsePort=COM1:
baud=9600
datasize=7
stopbits=1
parity=EVEN

If the IntelliPIN is a USB device then change the value of PortName, UsePort. Set the UsePort to "USB:"

Example:
[IntelliPIN]
DEVICE=IntelliPIN
FriendlyName=IntelliPIN
PortName=COM8:
UsePort=USB:

If the IntelliPIN is a Wedge device then change the value of PortName, UsePort. Set the UsePort to "KB:"

Example:
[IntelliPIN]
DEVICE=IntelliPIN
FriendlyName=IntelliPIN
PortName=COM8:
UsePort=KB:

Installing MiniMICR:

Set MiniMICR to 1 under the “INSTALL” section. If you have selected to install the MiniMICR driver then change the device settings under the “MiniMICR” section.

If the MiniMICR is a RS-232 device then change the values of PortName, UsePort, baud, datasize, stopbits, and parity.

Example:
[MiniMICR]
DEVICE=MiniMICR
FriendlyName=MiniMICR
PortName=COM8:
UsePort=COM1:
baud=9600
datasize=7
stopbits=1
parity=EVEN

If the MiniMICR is a USB device then change the value of PortName, UsePort. Set the UsePort to “USB:”

Example:
[MiniMICR]
DEVICE=MiniMICR
FriendlyName=MiniMICR
PortName=COM8:
UsePort=USB:

If the MiniMICR is a wedge device then change the values of PortName and UsePort. Set the UsePort to “KB:”

Example:
[MiniMICR]
DEVICE=MiniMICR
FriendlyName=MiniMICR
PortName=COM8:
UsePort=KB:

Installing MT-85:

Set “MT-85” to 1 under the “INSTALL” section. If you have selected to install the MT-85 driver then change the device settings under the “MT-85” section.

Change the value of PortName, UsePort, baud, datasize, stopbits, and parity.

Example:
[MT-85]
DEVICE= MT-85
FriendlyName= MT-85
PortName=COM8:
UsePort=COM1:
baud=9600
datasize=7
stopbits=1
parity=EVEN

Installing MT-95:

Set “MT-95” to 1 under the “INSTALL” section. If you have selected to install the MT-95 driver then change the device settings under the “MT-95” section.

Change the value of PortName, UsePort, baud, datasize, stopbits, and parity.

Example:
[MT-95]
DEVICE= MT-95
FriendlyName= MT-95
PortName=COM8:
UsePort=COM1:
baud=9600
datasize=7
stopbits=1
parity=EVEN

Installing Port Powered Swipe Reader:

Set “PPSR” under the “INSTALL” section. If you have selected to install the Port powered swipe reader driver then change the device settings under the “PPSR” section.

Change the value of PortName, UsePort, baud, datasize, stopbits, and parity.

Example:
[PPSR]
DEVICE= "Port-powered swipe reader"
FriendlyName="Port-powered swipe reader"
PortName=COM8:
UsePort=COM1:
baud=9600
datasize=7
stopbits=1
parity=EVEN

Installing Port powered Insert Reader:

Set “PPIR” under the “INSTALL” section. If you have selected to install the Port powered insert reader driver then change the device settings under the “PPIR” section.

Change the value of PortName, UsePort, baud, datasize, stopbits, and parity.

Example:
[PPIR]
DEVICE= "Port-powered insert reader"
FriendlyName="Port-powered insert reader"
PortName=COM8:
UsePort=COM1:
baud=9600
datasize=7
stopbits=1
parity=EVEN

Installing MagWedge:

Set “MagWedge” to 1 under the “INSTALL” section. If you have selected to install the MagWedge driver then change the device settings under the “MagWedge ” section.

Only PortName needs to be changed. The UsePort is already set to “KB:”.

Example:
[MagWedge]
DEVICE=MagWedge
FriendlyName=MagWedge
PortName=COM5:
UsePort=KB:

Installing MiniWedge:

Set “MiniWedge” to 1 under the “INSTALL” section. . If you have selected to install the MiniWedge driver then change the device settings under the “MiniWedge ” section.

Only PortName needs to be changed. The UsePort is already set to “KB:”.

Example:
[MiniWedge]
DEVICE=MiniWedge
FriendlyName=MiniWedge
PortName=COM5:
UsePort=KB:

Installing USB HID Swipe Reader:

Set “PPSR” to 1 under the “INSTALL” section. If you have selected to install the USB HID Swipe Reader driver then change the device settings under the “PPSR ” section.

Change the value of PortName and UsePort.

Example:
[PPSR]
DEVICE= "Port-powered swipe reader"
FriendlyName="Port-powered swipe reader"
PortName=COM8:
UsePort=USB:

Sample MTDINST.INI FILE

[INSTALL]
ForceReboot=0
MICR+=0
IntelliPIN=0
MiniMICR=0
MT-85=0
MT-95=0
Generic=0
PPIR=0
PPSR=0
MagWedge=0
MiniWedge=0
OPOS=0

[MagWedge]
DEVICE=MagWedge
FriendlyName=MagWedge
PortName=COM5:
UsePort=KB:

[MICR+]
DEVICE=MICR+
FriendlyName=MICR+
PortName=COM8:
UsePort=COM1:
baud=5760
datasize=7
stopbits=1
parity=EVEN

[MiniMICR]
DEVICE="MiniMICR"
FriendlyName="MiniMICR"
PortName=COM8:
UsePort=KB:
baud=9600
datasize=8
stopbits=1
parity=NONE

[MT-85]
DEVICE="MT-85"
FriendlyName="MT-85"

PortName=COM8:
UsePort=COM1:
baud=4800
datasize=7
stopbits=1
parity=ODD

[MT-95]
DEVICE="MT-95"
FriendlyName="MT-95"
PortName=COM8:
UsePort=COM1:
baud=9600
datasize=7
stopbits=1
parity=EVEN

[PPSR]
DEVICE="Port-powered swipe reader"
FriendlyName="Port-powered swipe reader"
PortName=COM12:
UsePort=USB:
baud=9600
datasize=8
stopbits=1
parity=NONE

[PPIR]
DEVICE="Port-powered insert reader"
FriendlyName="Port-powered insert reader"
PortName=COM8:
UsePort=COM1:
baud=9600
datasize=8
stopbits=1
parity=NONE

[Generic]
DEVICE="Generic"
FriendlyName="Generic"
PortName=COM8:
UsePort=COM2:
baud=9600
datasize=7
stopbits=1
parity=NONE

UNINSTALLING OLD MTD VERSIONS

If your system contains MTD drivers with a version prior to 1.12, you will need to uninstall them before installing the version 1.12 MTD drivers.

Uninstalling Old Drivers from Windows 95, 98/ME

Caution

The following assumes familiarity with the Registry Editor. Improper use of the Registry Editor can cause Windows to cease to function. Please follow the instructions carefully.

Complete removal of the drivers requires two steps: (1) remove the drivers from the system using the Device Manager and (2) remove the driver files manually after all devices have been removed by the Device Manager.

To remove the drivers, follow these steps:

1. Stop any applications that are using the drivers. This will insure that all of the ports that are going to be removed are closed.
2. Right-click on **My Computer** on the desktop or open the Control Panel and double click on the **System** icon then select **Properties**.
3. Select the **Device Manager** tab and click on the plus sign at MagTek.
4. Select the device under the **MagTek** group and click on **Remove**. Then click **OK**. After all device drivers have been removed in this manner, go to step 5.
5. Using Explorer or some other file manager, remove the following driver VXDs from **C:\Windows\System**:

   GENERIC.VXD
   IPIN.VXD
   MAGWEDGE.VXD
   MICRPLUS.VXD
   MINIMICR.VXD
   MINIWEDG.VXD
   MT85.VXD
   MT95.VXD
   MTPPINSR.VXD
   MTPPSWIP.VXD

   The driver files may be removed only if no drivers are currently installed that require them. In particular, the class driver (MAGTEKCL.VXD) must remain if any device type is still installed. The driver files may be removed when all devices of that particular type have been removed.
6. Remove the support files from **C:\Windows\System**. The support files are:

   DMAPLD.VXD
   DMVXD.VXD
   DMVXDD.VXD
   MAGTEKCL.DLL
   MAGTEKCL.VXD
   MAGCDFLT.HLP
   MAGCDFLT.DLL
   MAGCxxx.HLP (locale specific)

MAGCxxx.DLL (locale specific)

7. Find and remove the copy of the **MagTekOEMSETUP.INF** file made by Windows. In release 1 of Windows 95, it is located in **C:\Windows\inf**. With the OSR2 release of Windows 95 (Win95B) and Windows 98/ME, the files will be located in **C:\Windows\inf\other**.
8. Run the Registry Editor by clicking on **Start** button then select **Run**. Type **REGEDIT** into the text box and press the Enter key.
9. Delete the following sub-trees from the registry:
   HKEY_LOCAL_MACHINE\Software\Mag-Tek\ClassMap and
   HKEY_LOCAL_MACHINE\System\CurrentControlSet\Services\Class\Mag-Tek.
10. When in Windows 95, remove the following values from the registry:

    HKEY_LOCAL_MACHINE\System\CurrentControlSet\Control\InstalledFiles

    DMAPLD.VXD
    DMVXD.VXD
    DMVXDD.VXD
    IPIN.VXD
    MAGCDFLT.DLS
    MAGCDFLT.HLP
    MAGTEKCL.DLS
    MAGTEKCL.VXD
    MAGWEDGE.VXD
    MICRPLUS.VXD
    MINIMICR.VXD
    MINIWEDG.VXD
    MT85.VXD
    MT95.VXD
    MTPPINSR.VXD
    MTPPSWIP.VXD
11. When in Windows 98/ME, remove the following values from the registry:

    HKEY_LOCAL_MACHINE\Software\Microsoft\Windows\CurrentVersion\Setup\SetupX\Inf\OEMName

    %windir%\inf\other\MAGTE~1.INF
    %windir%\inf\other\MAGTEKOEMSETUP.INF

    HKEY_LOCAL_MACHINE\System\CurrentControlSet\Control\Installed Files\Rename

    MAGCDFLT.DLS
    MAGTEKCL.DLS

    HKEY_LOCAL_MACHINE\System\CurrentControlSet\Control\SessionManager\Known16DLLs

    MAGTEKCL.DLL

12. Close the Registry Editor by selecting **File / Exit**.

Uninstalling Old Drivers from Windows NT

Close any application that may have the MTD driver open before attempting to uninstall it. Failure to do this will cause the uninstallation to fail–after that the system must be re-booted before a subsequent attempt to uninstall the driver could be performed.

The driver can be uninstalled by using the Windows NT Installation Wizard. Open the Wizard by double-clicking on the Add/Remove Programs icon in the Control Panel. On the Install/Uninstall tab, find and select the entry that reads

Mag-Tek Device Drivers (MTD) uninstall

then click on the Add/Remove button. Administrative privilege is required to perform this operation. The uninstallation removes all MTD files and adjust the registry as required. The system must be re-booted to remove the keyboard hook driver from memory. Reinstallation will fail if the system is not re-booted after uninstalling the driver.

Uninstalling Old Drivers from Windows 2000/XP

Caution

Be sure to uninstall the keyboard Hook Driver before rebooting. (See below.)

Close any application that may have the MTD driver open before attempting to uninstall it. Failure to do this will cause the uninstallation to fail–after that the system must be re-booted before a subsequent attempt to uninstall the driver could be performed.

The driver can be uninstalled by using the Windows Installation Wizard. Open the Wizard by double-clicking on the Add/Remove Programs icon in the Control Panel. On the Install/Uninstall tab, find and select the entry that reads

Mag-Tek Device Drivers (MTD) uninstall

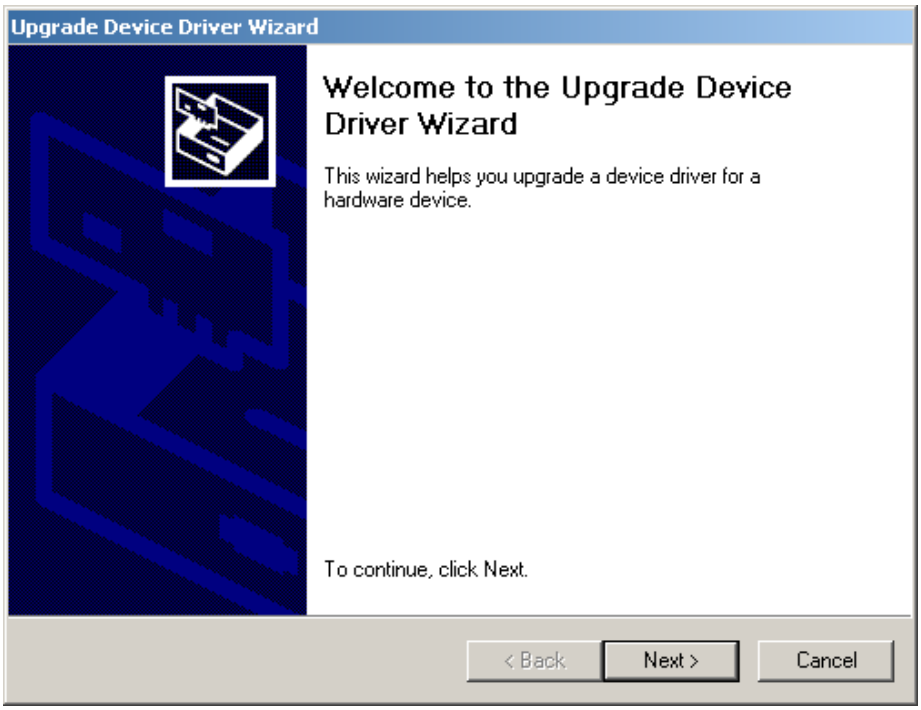
then click on the Add/Remove button. Administrative privilege is required to perform this operation. The uninstallation removes all MTD files and adjusts the registry as required.

Uninstalling the Keyboard Hook Driver (W2000)

For Windows 2000, the keyboard hook driver must be uninstalled after the driver binaries are uninstalled and before rebooting.

1. Right click on the “My Computer” icon or open the Control Panel and double click on the “System” icon.
2. Click on the “Hardware” tab.
3. Click on the ***Device Manager*** button.
4. Click on the ‘+’ to expand the “Keyboards” entry in the Device Manager list.
5. Right click on the “PC/AT Enhanced PS/2 Keyboard (101/102-Key)” entry.
6. Click the ***Properties*** item in the dialog box.
7. Click on the “Driver” tab.

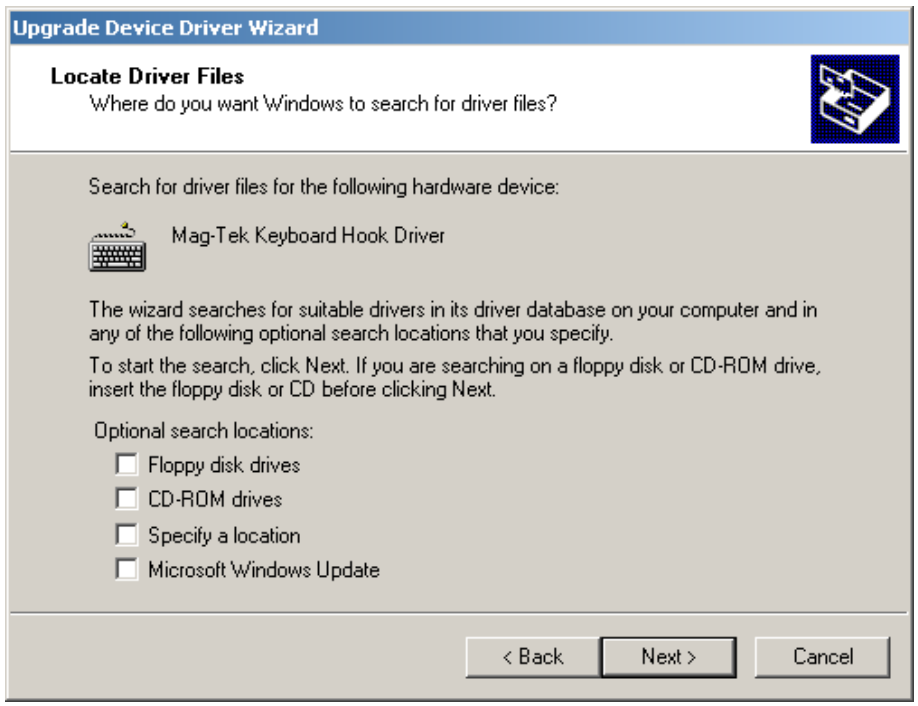
8. Click the ***Update Driver*** button to load the "Update Device Driver Wizard".



9. Click the ***Next*** button to advance to the next screen.

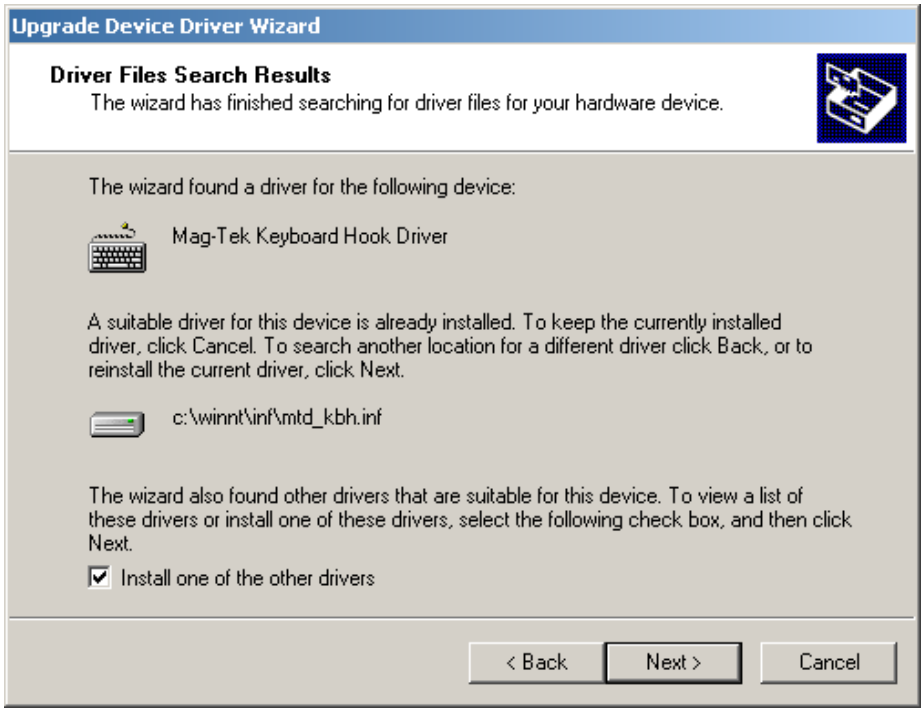
10. Select the "Search for a suitable driver…" radio button.

11. Click ***Next*** button to advance to the next screen.



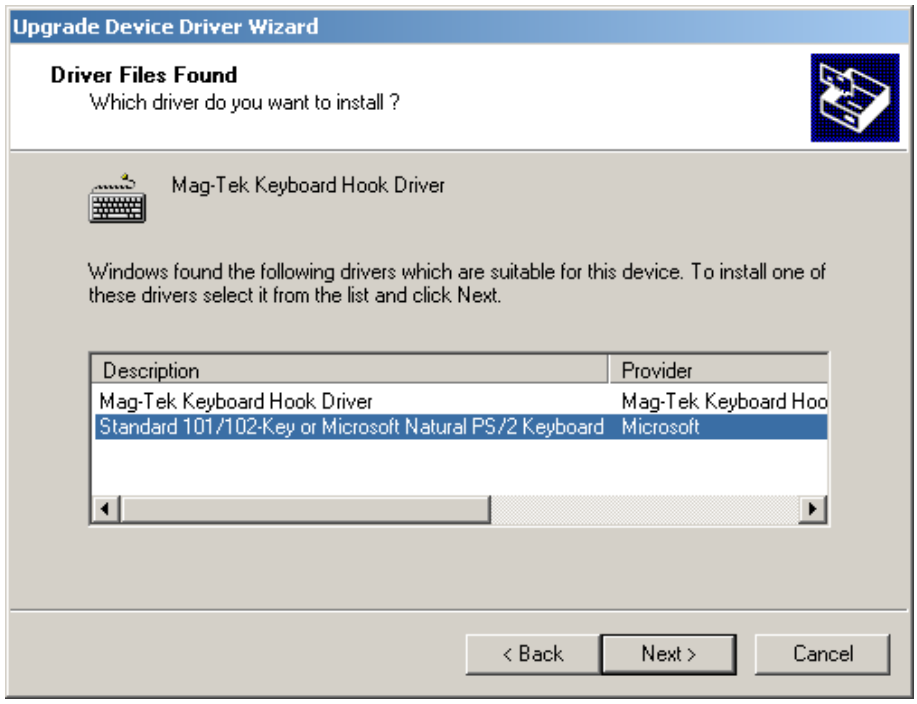
12. Uncheck all “Optional search locations” check boxes.

13. Click ***Next*** to advance to the next screen.



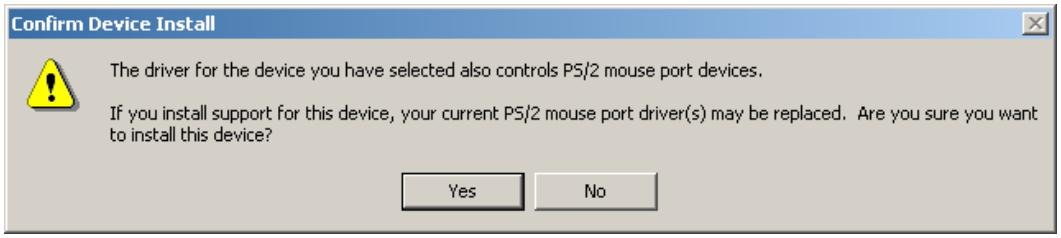
14. Check “Install one of the other drivers” check box.

15. Click ***Next*** to advance to the next screen.



16. Select “Standard 101/102-Key or Microsoft Natural PS/2 Keyboard” driver.

17. Click ***Next*** to advance to the next screen.

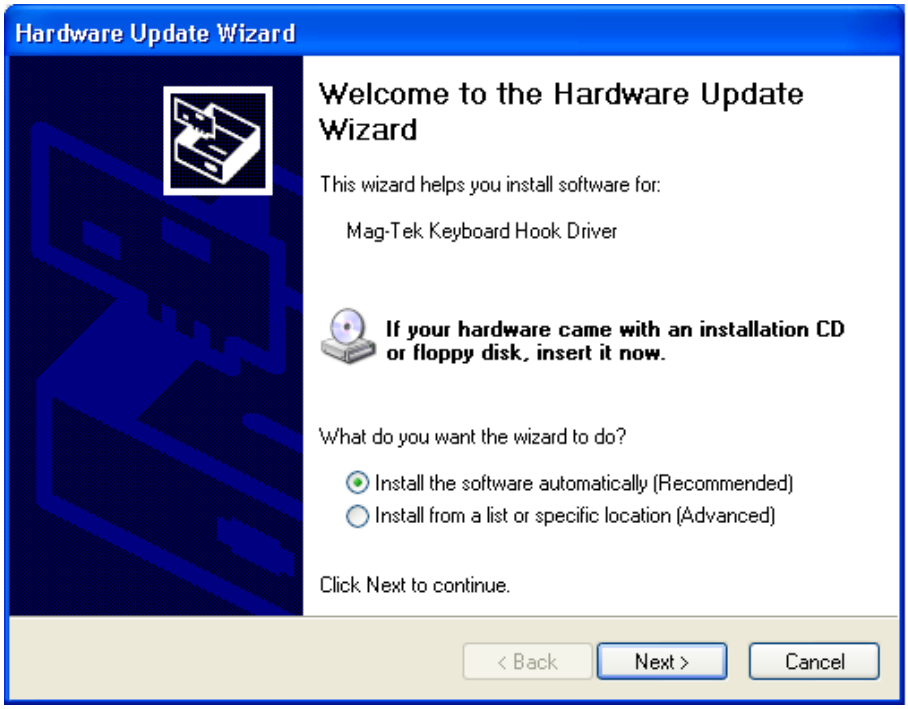


18. Answer ***Yes*** to the “Confirm Device Install”. (Note: This uninstallation procedure may hang at step 18. This is a non-disruptive hang-up. User should wait 10 seconds and do a hard reboot. Windows 2000 should recover without a system check or scan disk.)

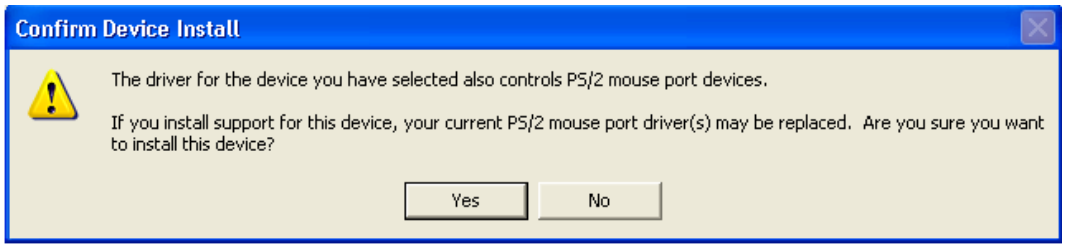
Uninstalling the Keyboard Hook Driver (XP)

For Windows XP, the keyboard hook driver must be uninstalled after the driver binaries are uninstalled and before rebooting.

1. Open the Control Panel and double click on the “System” icon.
2. Click on the “Hardware” tab.
3. Click on the ***Device Manager*** button.
4. Click on the ‘+’ to expand the “Keyboards” entry in the Device Manager list.
5. Right click on the “PC/AT Enhanced PS/2 Keyboard (101/102-Key)” entry.
6. Click the ***Properties*** item in the dialog box.
7. Click on the “Driver” tab.
8. Click the ***Update Driver*** button.



9. Select “Install the software automatically…” option.
10. Click the ***Next*** button to advance to the next screen.



11. Answer ***Yes*** to the “Confirm Device Install”. (Note: This uninstallation procedure may hang at step 11. This is a non-disruptive hang-up. User should wait 10 seconds and do a hard reboot. Windows XP should recover without a system check or scan disk.)

Using the MTCFG Utility (WNT/2000/XP)

While the Configurator program will usually be adequate to make changes to the MTD device installation, you may need to have more control in certain situations. For instance, you may need to investigate a problem with the installation of a particular device driver. The MTCFG utility offers more capability in dealing with the MTD drivers; however, it should only be used if the Configurator cannot be used for a particular case.

MTCFG.EXE is a command-line utility installed with the MTD drivers. You will need to open a CMD/DOS window to run it. It requires that the driver binaries be correctly installed, as described in the previous sections. MTCFG cannot be used to install the driver binaries; running it from the installation media before the driver has been installed will result in the following error message:

```
MagTek driver is not correctly installed. Please install the driver
before using this program.
```

The same message will be displayed if the installation has been modified manually, e.g., the installation script has been renamed or removed or the driver's Registry data has been removed.

It is recommended that all applications that may have opened a MagTek device be terminated before using MTCFG to change a device's configuration, or to add or remove a device.

Command Syntax Summary

Command Syntax	Meaning
`mtcfg`	list installed MagTek device drivers
`mtcfg -?`	display a help page
`mtcfg -help`	display a help page
`mtcfg -models`	list available MagTek device models
`mtcfg` *port-name*	list settings for a given device
`mtcfg` *port-name* `–all|more`	verbose list of settings
`mtcfg` *port-name model* [*settings*]	* add and configure a new device
`mtcfg` *port-name* `–delete`	* delete a device
`mtcfg` *port-name settings*	* change settings for a device

* these commands require Administrator privilege. MTCFG will display an error message if the current user is not an Administrator.

Displaying Configuration Information (WNT/2000/XP)

To display the list of configured MagTek devices, use the following syntax:

```
mtcfg
```

To display the settings for a single device, use:

```
mtcfg COMx
```

COM*x* is the name (virtual port) of the device, as set when the device was first configured. This name is shown in the leftmost column in the list of devices. This command displays only the common settings for the device–the ones that are most likely to require modification. To display all device settings, including all data parsing format strings, use the following syntax:

```
mtcfg COMx –all | more
```

The pipe symbol and “more” will present the information one screen at a time.

Configuring New Devices (WNT/2000/XP)

To add a new device use the following command syntax:

```
mtcfg port-name model
```

or

```
mtcfg port-name model settings
```

port-name is the name (virtual port) chosen for the new device. It must not be used by another device in the system (MagTek or other). The port name in the form COM*xxx* (valid values are COM5 .. COM255). MTCFG will verify that the name is not used by other MagTek devices that were set up with this utility, but it will not check whether the name is used by any other device in the system.

model is the full name of the device model to be added. The name should be enclosed in quotes if it contains spaces. Use "`mtcfg -models`" to see a list of models. The model names used by MTCFG are the ones specified in the [Models] section of the MTD installation script (OEMSETUP.INF).

settings specifies one or more device settings in the form *name=value*. The syntax for these is identical to the syntax used when modifying the settings of an already installed device. See the next section for a list of common settings. Specifying any settings when adding a device is optional-they can always be specified later (see the next section), but it is recommended to include at least those settings that are required for the device to operate, e.g., `UsePort` for serial devices.

Configuration Examples for Windows NT/2000/XP

These examples are for illustration only. Most of the command line entries will have to be modified to accommodate the actual installation.

Device or driver	Command Line	Comment
Generic RS-232	`MTCFG COM5 "Generic Serial (RS-232)" FriendlyName=MT-80 UsePort=COM1 baud=4800 parity=0 datasize=7`	Be sure to specify the proper communication parameters for the selected device.
Generic KB	`MTCFG COM6 "Generic Wedge (Keyboard)" FriendlyName=MagReader`	"UsePort" is not required for keyboard devices.
IntelliPIN RS-232	`MTCFG COM7 "IntelliPIN MICR Aux" FriendlyName=IntelliPIN "UsePort=AUX port on MICR+"`	The MICR+ driver must be installed before this driver.
IntelliPIN RS-232	`MTCFG COM8 "IntelliPIN RS-232" FriendlyName=PINPad UsePort=COM2`	Communication parameters may be required.
IntelliPIN KB	`MTCFG COM9 "IntelliPIN Wedge" "FriendlyName=IntelliPIN KB"`	Quotes are used for Friendly Name to allow the space.
Mag-Wedge	`MTCFG COM10 "Mag-Wedge" "FriendlyName=Wedge Reader"`	
MICR+	`MTCFG COM11 "MICR+" FriendlyName=MICR+ UsePort=COM1`	Communication parameters may be required.
Mini MICR RS-232	`MTCFG COM12 "Mini MICR RS-232" FriendlyName=MICRS UsePort=COM1`	Communication parameters may be required.
Mini MICR KB	`MTCFG COM13 "Mini MICR Wedge" FriendlyName=MICRW`	
MiniWedge	`MTCFG COM14 "MiniWedge" FriendlyName=MSR`	
MT-85	`MTCFG COM15 "MT-85" "FriendlyName=MSR Encoder" UsePort=COM2`	Communication parameters may be required.
MT-95	`MTCFG COM16 "MT-95" FriendlyName=MT-95 UsePort=COM1 baud=9600 parity=-1 datasize=8`	Communication parameters may not be required.
Port Powered Insert Reader	`MTCFG COM17 "Port-powered insert reader" FriendlyName=PPInsert UsePort=COM1`	No communication parameters are required.
Port Powered Swipe Reader	`MTCFG COM18 "Port-powered swipe reader" FriendlyName=PPSwipe UsePort=COM2`	No communication parameters are required.

Modifying a Device Driver's Settings (WNT/2000/XP)

Use the following syntax to change settings of a device:

```
mtcfg <port-name> <setting1> [<setting2> [<setting3>...]]
```

each of the settings is specified as

name=value

if *value* contains spaces, the whole *name=value* string should be enclosed in quotes (not just the value), e.g., to specify the string “MT-85 on COM1” as the friendly name for COM5 with a baud rate of 9600 bps, use the following syntax:

```
mtcfg COM5 ”FriendlyName=MT-85 on COM1” baud=9600
```

Following is a list of common settings that can be changed for a device. Most settings have a default value and may be missing when the list of settings is requested for a device (e.g., by typing “MTCFG COM5”).

Name	Use
baud	(optional, used for serial devices only) device's baud rate, specified as an integer (e.g., 9600)
parity	(optional, used for serial devices only) an integer specifying the parity used by the device: use -1, 0, 1, 2, or 3 for None, Even, Odd, Space and Mark parity respectively.
datasize	(optional, used for serial devices only) specifies the device's serial word size in bits: 7 or 8.
stopbits	(optional, used for serial devices only) stop bits to use on transmission: 1 or 2.
UsePort	the serial port to which the device is connected. Must specify a valid standard serial port (or a port that is 100% compatible with a standard serial port).
FriendlyName	(optional) alternative name for the device. If specified, the device may be opened from user mode using this name (the prefix \\.\ must be added to the name. For example if FriendlyName=Port-powered swipe reader, this device can be opened as "\\.\Port-powered swipe reader")
EnableFDP	(optional) Enable Flexible Data Parsing. Set this to 1 to enable data parsing and to 0 to disable data parsing.
PortName	Specifies the port name under which the device is visible to user-mode applications. Modifying this setting also changes the name used to refer to this device when using the MTCFG utility, e.g., if mtcfg COM5 PortName=COM8 is executed, the device that was COM5, must be referred to as COM8 in any subsequent invocations of MTCFG. This setting is treated specially by MTCFG–it will validate the port name and make sure that it is not used by other MagTek devices before making the change.

Device settings other than the ones listed above should not be modified without carefully reviewing the driver's engineering documentation for the specific device model.

Removing a Device (WNT/2000/XP)

To remove a MagTek device use the following command syntax:

```
mtcfg port-name -delete
```

The device is removed and all non-default settings specified for it are lost.

This operation does not remove any files from the system. To remove all devices and uninstall the MTD driver, follow the instructions in the next section.

MTD PROGRAMMING EXAMPLES

Example programs are included in the following directory:

File or Directory Name	DESCRIPTION
\EXAMPLES\CPP	Visual C++ example application (executable and source).
\EXAMPLES\DELPHI	MSCOMM and file I/O based Delphi sample applications (executables and sources)
\EXAMPLES\VB50	MSCOMM and file I/O based Visual Basic sample applications (executables and sources)
\EXAMPLES\PwrBldr	Power Builder example using the IntelliPIN

APPENDIX B. COMMAND LIST SUMMARY

This is a consolidated list of all available commands for the MagTek Windows Drivers.

Command	Description	Page
/cancel *cmd*	Cancel a command. *cmd* can be any of the transaction commands.	16
/display *[x]*	Display a message or two alternating messages on the LCD screen.	17
/echo *string*	Driver test command.	17
/event *n data*	Response to an unsolicited event notification.	18
/get *prop*	Get a property.	18
/load_key *n key*	Load a key into the device.	19
/rawrecv	Receive data from the device	20
/rawsend *x*	Send arbitrary data to the device.	21
/rawxact *x*	Execute a send/receive transaction with the device in raw mode.	21
/read *[[x] y]*	Read data from the device.	22
/reset	Clear any pending operations and reset the device to initial state.	26
/set *prop val*	Set a property.	26
/ver	Read driver version.	26
/write *data*	Encode magnetic stripe command.	27

APPENDIX C. STATUS CODES

The following table defines the status codes returned in command responses. Note that it is not meant as a complete list of status codes–new codes may be added as necessary.

Value	Mnemonic and Description
00	successful operation
05	port already open
1F	wrong device ID
22	value, buffer, whatever may overflow
30	value not valid in operation context
31	value not valid in module's context
32	value out of range
34	text or formatted data syntax error
35	name invalid in module's context
40	internal error. Unexpected result from a system API
41	driver internal error
45	operation rejected (inappropriate state)
47	operation failed or not successful
60	I/O error (peripheral error)
62	requested item not found
63	duplicated item is not allowed
74	access type not appropriate / not possible
79	No response (no device ID)
81	a time-out has expired
82	operation cancelled on caller's request
83	operation aborted (on system, user or module's request)
93	feature not implemented
94	partial implementation or feature not supported

APPENDIX D. DEVICE DRIVER SUMMARIES

This section contains summaries of Device Drivers for the for the following models:

- IntelliPIN
- MagWedge Reader
- MiniWedge Reader
- MICR+ Reader
- Mini-MICR Reader
- Port Powered RS-232 Swipe Reader
- Port Powered RS-232 Insertion Reader
- MT-85 Encoder
- MT-95 Encoder
- Generic

The summary for each model contains a list of the commands properties supported.

INTELLIPIN PINPAD & MSR

File Name IPIN

Friendly Name(s) IntelliPIN RS-232, IntelliPIN Wedge & IntelliPIN MICR+ Aux

Remarks The Automatic Settings in the properties sheet are not supported; the communications must be specified manually. When using the IntelliPIN on the MICR+ Aux port, the MICR+ driver must be installed before the IntelliPIN driver; also the IntelliPIN driver must be closed before the MICR+ driver is closed.

Commands Supported					
/cancel *cmd*	X	**/load_key** *n key*	X	**/reset**	X
/display *[x]*	X	**/rawrecv**	X	**/set** *prop val*	X
/echo *string*	X	**/rawsend** *x*	X	**/ver**	X
/event *n data*		**/rawxact** *x*	X	**/write** *data*	
/get *prop*	X	**/read** *[[x] y]*	X		

Properties Supported								
Property	**Yes**	**Default**	**Property**	**Yes**	**Default**	**Property**	**Yes**	**Default**
account_no	X		chk_mod10			msg3	X	
amount	X		chk_number			msg4	X	
applied_fmt	X		chk_routing			offline_enc		
c_card_stat			chk_status			oper_tout	X	*
c_cardwpin	X	1	chk_transit			pin_blk_fmt	X	*
c_check		0	cmd_pending	X		pinfilldig	X	*
c_events			dblpinentry	X	*	port_name	X	
c_keypress	X	1	dev_status	X		pwroffdelay	X	*
c_keystring	X	1	dev_version	X	*	s_down_tout	X	*
c_magnetic	X	1	enable_cmc7			track1ss	X	
c_mechanics		0	enc_key	X		track2ss	X	
c_pin	X	1	enc_key_sn	X	*	track3ss	X	
c_smart		0	enc_mode	X	*	trivpinchk	X	*
c_tracks	X	111	entry_echo	X		trk_enable	X	*
c_write		0	entry_len	X		trk1data	X	
c_wr_secure			entry_tout	X		trk2data	X	
capitalize	X	1	events_on			trk3data	X	
card_stat			invalcmdrsp	X		visa_mac1	X	
chk_account			key_parity	X	*	visa_mac2	X	
chk_amount			lasterr	X		visa_mac3	X	
chk_bankid			max_pin_len	X	*	wr_coer		
chk_data			msg1	X		wr_secure		
chk_format			msg2	X		xact_type	X	d

* = Depends on setting in the device.

MAGWEDGE SWIPE READER

File Name MAGWEDGE

Friendly Name(s) MagWedge

Remarks The driver cannot determine which tracks are supported on the device, so the **c_tracks** and **trk_enable** properties will always indicate **111**.

Commands Supported					
/cancel *cmd*	X	**/load_key** *n key*		**/reset**	X
/display *[x]*		**/rawrecv**	X	**/set** *prop val*	X
/echo *string*	X	**/rawsend** *x*	X	**/ver**	X
/event *n data*		**/rawxact** *x*	X	**/write** *data*	
/get *prop*	X	**/read** *[[x] y]*	X		

Properties Supported								
Property	**Yes**	**Default**	**Property**	**Yes**	**Default**	**Property**	**Yes**	**Default**
account_no			chk_mod10			msg3		
amount			chk_number			msg4		
applied_fmt	X		chk_routing			offline_enc		
c_card_stat			chk_status			oper_tout		
c_cardwpin			chk_transit			pin_blk_fmt		
c_check		0	cmd_pending			pinfilldig		
c_events			dblpinentry			port_name	X	
c_keypress			dev_status	X		pwroffdelay		
c_keystring			dev_version			s_down_tout		
c_magnetic	X	1	enable_cmc7			track1ss	X	
c_mechanics		0	enc_key			track2ss	X	
c_pin			enc_key_sn			track3ss	X	
c_smart		0	enc_mode			trivpinchk		
c_tracks	X	111	entry_echo			trk_enable	X	111
c_write		0	entry_len			trk1data	X	
c_wr_secure			entry_tout			trk2data	X	
capitalize	X	1	events_on			trk3data	X	
card_stat			invalcmdrsp	X	0	visa_mac1		
chk_account			key_parity			visa_mac2		
chk_amount			lasterr	X		visa_mac3		
chk_bankid			max_pin_len			wr_coer		
chk_data			msg1			wr_secure		
chk_format			msg2			xact_type		

* = Depends on setting in the device.

MINIWEDGE MSR

File Name MINIWEDG

Friendly Name(s) MiniWedge

Remarks When operating in the Windows Driver mode, the MiniWedge transmits data as ASCII characters instead of scan codes in order to reduce the transmission time. (A full 3-track card can be transmitted in about 0.5 second whereas in the non-driver mode it would take almost 4 seconds.) If this creates problems in certain hardware implementations, the *skip_ascii* and *dev_char_delay* parameters in the registry and/or INF file can be adjusted. The default setting for *dev_char_delay* is "01"; if this seems to be too fast, try setting this to "06". Additionally, the *skip_ascii* value can be set to true ("01") to transmit scan codes.

Commands Supported					
/cancel *cmd*	X	**/load_key** *n key*		**/reset**	X
/display *[x]*		**/rawrecv**	X	**/set** *prop val*	X
/echo *string*	X	**/rawsend** *x*	X	**/ver**	X
/event *n data*		**/rawxact** *x*	X	**/write** *data*	
/get *prop*	X	**/read** *[[x] y]*	X		

Properties Supported								
Property	**Yes**	**Default**	**Property**	**Yes**	**Default**	**Property**	**Yes**	**Default**
account_no			chk_mod10			msg3		
amount			chk_number			msg4		
applied_fmt	X		chk_routing			offline_enc		
c_card_stat			chk_status			oper_tout		
c_cardwpin			chk_transit			pin_blk_fmt		
c_check		0	cmd_pending			pinfilldig		
c_events			dblpinentry			port_name	X	
c_keypress			dev_status	X		pwroffdelay		
c_keystring			dev_version	X		s_down_tout		
c_magnetic	X	1	enable_cmc7			track1ss	X	
c_mechanics		0	enc_key			track2ss	X	
c_pin			enc_key_sn			track3ss	X	
c_smart		0	enc_mode			trivpinchk		
c_tracks	X	*	entry_echo			trk_enable	X	*
c_write		0	entry_len			trk1data	X	
c_wr_secure			entry_tout			trk2data	X	
capitalize	X	1	events_on			trk3data	X	
card_stat			invalcmdrsp	X	0	visa_mac1		
chk_account			key_parity			visa_mac2		
chk_amount			lasterr	X		visa_mac3		
chk_bankid			max_pin_len			wr_coer		
chk_data			msg1			wr_secure		
chk_format			msg2			xact_type		

* = Depends on setting in the device.

MICR+ CHECK READER & MSR

File Name MICRPLUS

Friendly Name(s) MICR+

Remarks These devices may or may not have an MSR installed. If not installed, the driver may not properly indicate the **c_tracks** capability.

Commands Supported					
/cancel *cmd*	X	**/load_key** *n key*		**/reset**	X
/display *[x]*		**/rawrecv**	X	**/set** *prop val*	X
/echo *string*	X	**/rawsend** *x*	X	**/ver**	X
/event *n data*		**/rawxact** *x*	X	**/write** *data*	
/get *prop*	X	**/read** *[[x] y]*	X		

Properties Supported								
Property	Yes	Default	Property	Yes	Default	Property	Yes	Default
account_no			chk_mod10	X		msg3		
amount			chk_number	X		msg4		
applied_fmt	X		chk_routing	X		offline_enc		
c_card_stat			chk_status	X		oper_tout		
c_cardwpin			chk_transit	X		pin_blk_fmt		
c_check	X	1	cmd_pending			pinfilldig		
c_events			dblpinentry			port_name	X	
c_keypress			dev_status	X		pwroffdelay		
c_keystring			dev_version	X		s_down_tout		
c_magnetic	X	1	enable_cmc7	X	*	track1ss	X	
c_mechanics		0	enc_key			track2ss	X	
c_pin			enc_key_sn			track3ss	X	
c_smart		0	enc_mode			trivpinchk		
c_tracks	X	*	entry_echo			trk_enable	X	*
c_write		0	entry_len			trk1data	X	
c_wr_secure			entry_tout			trk2data	X	
capitalize	X	1	events_on			trk3data	X	
card_stat			invalcmdrsp	X	0	visa_mac1		
chk_account	X		key_parity			visa_mac2		
chk_amount	X		lasterr	X		visa_mac3		
chk_bankid	X		max_pin_len			wr_coer		
chk_data	X		msg1			wr_secure		
chk_format	X	**	msg2			xact_type		

* = Depends on setting in the device.

** = Depends on setting in INF file (default = 6500). See Section 1, "MICR Format Numbers" for more information.

MINI MICR CHECK READER & MSR

File Name MINIMICR

Friendly Name(s) Mini MICR RS-232 & Mini MICR Wedge

Remarks These devices may or may not have an MSR installed. If not installed, the driver may not properly indicate the **c_tracks** capability.

Commands Supported					
/cancel *cmd*	X	**/load_key** *n key*		**/reset**	X
/display *[x]*		**/rawrecv**	X	**/set** *prop val*	X
/echo *string*	X	**/rawsend** *x*	X	**/ver**	X
/event *n data*		**/rawxact** *x*	X	**/write** *data*	
/get *prop*	X	**/read** *[[x] y]*	X		

Properties Supported								
Property	**Yes**	**Default**	**Property**	**Yes**	**Default**	**Property**	**Yes**	**Default**
account_no			chk_mod10	X		msg3		
amount			chk_number	X		msg4		
applied_fmt	X		chk_routing	X		offline_enc		
c_card_stat			chk_status	X		oper_tout		
c_cardwpin			chk_transit	X		pin_blk_fmt		
c_check	X	1	cmd_pending			pinfilldig		
c_events			dblpinentry			port_name	X	
c_keypress			dev_status	X		pwroffdelay		
c_keystring			dev_version	X		s_down_tout		
c_magnetic	X	1	enable_cmc7	X	*	track1ss	X	
c_mechanics		0	enc_key			track2ss	X	
c_pin			enc_key_sn			track3ss	X	
c_smart		0	enc_mode			trivpinchk		
c_tracks	X	*	entry_echo			trk_enable	X	*
c_write		0	entry_len			trk1data	X	
c_wr_secure			entry_tout			trk2data	X	
capitalize	X	1	events_on			trk3data	X	
card_stat			invalcmdrsp	X	0	visa_mac1		
chk_account	X		key_parity			visa_mac2		
chk_amount	X		lasterr	X		visa_mac3		
chk_bankid	X		max_pin_len			wr_coer		
chk_data	X		msg1			wr_secure		
chk_format	X	**	msg2			xact_type		

* = Depends on setting in the device.

** = Depends on setting in INF file (default = 6500). See "See Section 1, "MICR Format Numbers" for more information.

PORT-POWERED RS-232 SWIPE READER

File Name MTPPSWIP

Friendly Name(s) Port-powered swipe reader

Remarks This driver supports all port-powered swipe readers.

Commands Supported					
/cancel *cmd*	X	**/load_key** *n key*		**/reset**	X
/display *[x]*		**/rawrecv**	X	**/set** *prop val*	X
/echo *string*	X	**/rawsend** *x*	X	**/ver**	X
/event *n data*		**/rawxact** *x*	X	**/write** *data*	
/get *prop*	X	**/read** *[[x] y]*	X		

Properties Supported								
Property	**Yes**	**Default**	**Property**	**Yes**	**Default**	**Property**	**Yes**	**Default**
account_no			chk_mod10			msg3		
amount			chk_number			msg4		
applied_fmt	X		chk_routing			offline_enc		
c_card_stat			chk_status			oper_tout		
c_cardwpin			chk_transit			pin_blk_fmt		
c_check		0	cmd_pending			pinfilldig		
c_events			dblpinentry			port_name	X	
c_keypress			dev_status	X		pwroffdelay		
c_keystring			dev_version	X		s_down_tout		
c_magnetic	X	1	enable_cmc7			track1ss	X	
c_mechanics		0	enc_key			track2ss	X	
c_pin			enc_key_sn			track3ss	X	
c_smart		0	enc_mode			trivpinchk		
c_tracks	X	*	entry_echo			trk_enable	X	*
c_write		0	entry_len			trk1data	X	
c_wr_secure			entry_tout			trk2data	X	
capitalize	X	1	events_on			trk3data	X	
card_stat			invalcmdrsp	X	0	visa_mac1		
chk_account			key_parity			visa_mac2		
chk_amount			lasterr	X		visa_mac3		
chk_bankid			max_pin_len			wr_coer		
chk_data			msg1			wr_secure		
chk_format			msg2			xact_type		

* = Depends on setting in the device.

PORT-POWERED RS-232 INSERTION READER

File Name MTPPINSR

Friendly Name(s) Port-powered insert reader

Remarks If **events_on** is enabled, the driver will send **/event 1 M** when the card is inserted. It is suggested that events be disabled (**/set events_on 0**) before the data is read to prevent the removal event from being included at the end of card data. If a card has already been inserted when the driver is opened, there will not be any notification when **events_on** is enabled. Consequently, it is recommended that **/get card_stat** be issued immediately after opening the driver to see if a card is blocking the sensor.

Commands Supported					
/cancel *cmd*	X	**/load_key** *n key*		**/reset**	X
/display *[x]*		**/rawrecv**	X	**/set** *prop val*	X
/echo *string*	X	**/rawsend** *x*	X	**/ver**	X
/event *n data*	X	**/rawxact** *x*	X	**/write** *data*	
/get *prop*	X	**/read** *[[x] y]*	X		

Properties Supported								
Property	**Yes**	**Default**	**Property**	**Yes**	**Default**	**Property**	**Yes**	**Default**
account_no			chk_mod10			msg3		
amount			chk_number			msg4		
applied_fmt	X		chk_routing			offline_enc		
c_card_stat	X	1	chk_status			oper_tout		
c_cardwpin			chk_transit			pin_blk_fmt		
c_check		0	cmd_pending			pinfilldig		
c_events	X	1	dblpinentry			port_name	X	
c_keypress			dev_status	X		pwroffdelay		
c_keystring			dev_version	X		s_down_tout		
c_magnetic	X	1	enable_cmc7			track1ss	X	
c_mechanics		0	enc_key			track2ss	X	
c_pin			enc_key_sn			track3ss	X	
c_smart		0	enc_mode			trivpinchk		
c_tracks	X	110	entry_echo			trk_enable	X	110
c_write		0	entry_len			trk1data	X	
c_wr_secure			entry_tout			trk2data	X	
capitalize	X	1	events_on	X	0	trk3data	X	
card_stat	X		invalcmdrsp	X	0	visa_mac1		
chk_account			key_parity			visa_mac2		
chk_amount			lasterr	X		visa_mac3		
chk_bankid			max_pin_len			wr_coer		
chk_data			msg1			wr_secure		
chk_format			msg2			xact_type		

* = Depends on setting in the device.

MT-85 LOCO ENCODER

File Name MT85

Friendly Name(s) MT-85

Remarks The driver attempts to connect to the device by automatically scanning all connection modes.

Commands Supported					
/cancel *cmd*	X	**/load_key** *n key*		**/reset**	X
/display *[x]*		**/rawrecv**	X	**/set** *prop val*	X
/echo *string*	X	**/rawsend** *x*	X	**/ver**	X
/event *n data*		**/rawxact** *x*	X	**/write** *data*	X
/get *prop*	X	**/read** *[[x] y]*	X		

Properties Supported								
Property	**Yes**	**Default**	**Property**	**Yes**	**Default**	**Property**	**Yes**	**Default**
account_no			chk_mod10			msg3		
amount			chk_number			msg4		
applied_fmt	X		chk_routing			offline_enc		
c_card_stat			chk_status			oper_tout		
c_cardwpin		0	chk_transit			pin_blk_fmt		
c_check		0	cmd_pending	X		pinfilldig		
c_events			dblpinentry			port_name	X	
c_keypress		0	dev_status	X		pwroffdelay		
c_keystring		0	dev_version	X		s_down_tout		
c_magnetic	X	1	enable_cmc7			track1ss	X	
c_mechanics		0	enc_key			track2ss	X	
c_pin		0	enc_key_sn			track3ss	X	
c_smart		0	enc_mode			trivpinchk		
c_tracks	X	*	entry_echo			trk_enable	X	*
c_write	X	2	entry_len			trk1data	X	
c_wr_secure	X	0	entry_tout			trk2data	X	
capitalize	X	1	events_on			trk3data	X	
card_stat			invalcmdrsp	X	0	visa_mac1		
chk_acount			key_parity			visa_mac2		
chk_amount			lasterr	X		visa_mac3		
chk_bankid			max_pin_len			wr_coer	X	1
chk_data			msg1			wr_secure		
chk_format			msg2			xact_type		

* = Depends on setting in the device.

MT-95 HICO ENCODER

File Name MT95
Friendly Name(s) MT-95
Remarks

Commands Supported					
/cancel *cmd*	X	**/load_key** *n key*		**/reset**	X
/display *[x]*		**/rawrecv**	X	**/set** *prop val*	X
/echo *string*	X	**/rawsend** *x*	X	**/ver**	X
/event *n data*		**/rawxact** *x*	X	**/write** *data*	X
/get *prop*	X	**/read** *[[x] y]*	X		

Properties Supported								
Property	**Yes**	**Default**	**Property**	**Yes**	**Default**	**Property**	**Yes**	**Default**
account_no			chk_mod10			msg3		
amount			chk_number			msg4		
applied_fmt	X		chk_routing			offline_enc	X	*
c_card_stat			chk_status			oper_tout		
c_cardwpin			chk_transit			pin_blk_fmt		
c_check		0	cmd_pending	X		pinfilldig		
c_events			dblpinentry			port_name	X	
c_keypress			dev_status	X		pwroffdelay		
c_keystring			dev_version	X		s_down_tout		
c_magnetic	X	1	enable_cmc7			track1ss	X	
c_mechanics		0	enc_key			track2ss	X	
c_pin			enc_key_sn			track3ss	X	
c_smart		0	enc_mode			trivpinchk		
c_tracks	X	111	entry_echo			trk_enable	X	*
c_write	X	1	entry_len			trk1data	X	
c_wr_secure	X	1	entry_tout			trk2data	X	
capitalize	X	1	events_on			trk3data	X	
card_stat			invalcmdrsp	X	0	visa_mac1		
chk_account			key_parity			visa_mac2		
chk_amount			lasterr	X		visa_mac3		
chk_bankid			max_pin_len			wr_coer	X	*
chk_data			msg1			wr_secure	X	*
chk_format			msg2			xact_type		

* = Depends on setting in the device.

GENERIC

File Name GENERIC

Friendly Name(s) Generic

Remarks This driver only supports *raw* commands. None of the properties are supported.

Commands Supported					
/cancel *cmd*	X	**/load_key** *n key*		**/reset**	X
/display *[x]*		**/rawrecv**	X	**/set** *prop val*	
/echo *string*	X	**/rawsend** *x*	X	**/ver**	X
/event *n data*		**/rawxact** *x*	X	**/write** *data*	
/get *prop*		**/read** *[[x] y]*			

Properties Supported								
Property	Yes	Default	Property	Yes	Default	Property	Yes	Default
account_no			chk_mod10			msg3		
amount			chk_number			msg4		
applied_fmt			chk_routing			offline_enc		
c_card_stat			chk_status			oper_tout		
c_cardwpin			chk_transit			pin_blk_fmt		
c_check			cmd_pending			pinfilldig		
c_events			dblpinentry			port_name		
c_keypress			dev_status			pwroffdelay		
c_keystring			dev_version			s_down_tout		
c_magnetic			enable_cmc7			track1ss		
c_mechanics			enc_key			track2ss		
c_pin			enc_key_sn			track3ss		
c_smart			enc_mode			trivpinchk		
c_tracks			entry_echo			trk_enable		
c_write			entry_len			trk1data		
c_wr_secure			entry_tout			trk2data		
capitalize			events_on			trk3data		
card_stat			invalcmdrsp			visa_mac1		
chk_acount			key_parity			visa_mac2		
chk_amount			lasterr			visa_mac3		
chk_bankid			max_pin_len			wr_coer		
chk_data			msg1			wr_secure		
chk_format			msg2			xact_type		

INDEX

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X