RS-232 to I²C Host Adapter
with ASCII Fast Mode Interface
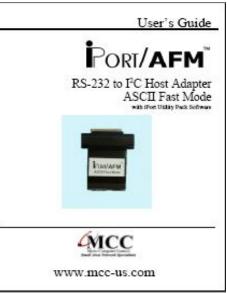
MIIC-203

iPort/AFM™

iPort/AFM brings I²C directly to ***any*** computer with an RS-232 serial port. Just plug an **iPort/AFM** into your computer's serial port, load our free software, and you will be sending and receiving I²C messages at up to 400Kbit/s in seconds.

PRODUCT HIGHLIGHTS

- **Turn *ANY* Computer's Serial Port into an I2C Port.**
- **Supports 7-bit addressing Standard (100k) and Fast (400k) Mode I2C Bus Activity.**
- **High Performance I2C Bus Co-Processor.**
- **Maximum I2C Bus Throughput with Low Overhead.**
- **19.2, 57.6, and 115.2k RS-232 Baud Rates.**
- **Supports Bus Master and Slave, Transmit and Receive, and /INT Signaling.**
- **Supports Multi-Master systems with Arbitration Loss Detection.**
- **Compatible with 3.3v to 5v I2C at up to 400Kbps.**
- **Includes our I2C Message Manager and Message Center Applications.**
- **Use our simple ASCII commands to build your own custom I2C applications.**
- **Compatible with existing iPort/AI applications.**
- **Compatible with our LabVIEW Driver Library.**
- **Extended Commands support 2-Wire, "I2C-Like" and low level signaling.**
- **Philips' microcontroller-based. Fully licensed to use the I2C Bus technology.**

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The **iPort/AFM** is our fastest and most powerful I2C Bus host adapter. Its RS-232 serial port interface and simple ASCII commands allows the iPort/AFM to operate with any operating system, and its compatible with most embedded systems. Applications include product development and testing, EEPROM loading, device control and sensor networking.

Over the past few years, the I2C Bus has expanded from simple control to data intensive applications. As new uses arise, bus bandwidth and message overhead have become key issues in product design and testing. The iPort/AFM, our third generation adapter for the I2C Bus, addresses these issues by supporting several bus speeds, including fast mode (400kbit/s), and three RS-232 transfer rates up to 115.2K baud. Implemented using a high-performance bus co-processor with optimized instruction set, the adapter also includes large message buffers (256 bytes) to reduce host

computer and bus overhead. In addition to operating as a bus master or slave in a multi-master system, a built-in bi-directional /INT signal line allows the device to receive or generate slave only device notifications.

The iPort/AFM will work with any application written for our iPort/AI, only 4 to 40X faster. When operating with new applications written specifically for the iPort/AFM, speed increases up to 100X faster are possible.

Master and Slave, Transmit and Receive, iPort/AFM supports I2C message modes including Multi-Master, Arbitration Loss Detection, with messages from 1 to 32K bytes in length.

Start sending I2C messages in minutes using our Message Manager or Message Center applications included with each adapter. You can also use your computer's terminal emulation software (like Windows' Hyperterminal Program), or create your own custom I2C applications using any programming tool that can access your computer's serial port.

<table>
<tr><td colspan="2" align="center">iPort/AFM
ASCII Text Interface Commands</td></tr>
<tr><td><u>Command</u></td><td><u>Description</u></td></tr>
<tr><td></td><td>Note: [CR] = Carriage Return Code or Enter Key.
Syntax: [Select], (Optional), xx = [00..FE], n = [1..32767]</td></tr>
<tr><td>Ctrl/R,Ctrl/R,Ctrl/R</td><td>iPort/AFM Reset
This command resets the iPort/AFM to its default state.</td></tr>
<tr><td>//[CR]</td><td>Status Display
Display iPort/AFM status information.</td></tr>
<tr><td>/B[0|1|2][CR]</td><td>RS-232 Baud Rate Control (iPort/AFM Enhanced Feature)
Set the RS-232 Baud Rate (0=19.2, 1=57.6, 2=115.2k)</td></tr>
<tr><td>/C[CR]</td><td>Close I2C Connection
Disconnect from the I2C Bus.</td></tr>
<tr><td>/Dxx[CR]</td><td>Set Destination I2C Slave Address
Set the destination I2C Slave Address for subsequent Master Transmit or Receive operations.</td></tr>
<tr><td>/E[0|1][CR]</td><td>Echo/Prompt Control [0 = Disable, 1 = Enable]
Enable/Disable data entry echo and prompts.</td></tr>
<tr><td>/F[0|1][CR]</td><td>Flow Control [0 = XON/XOFF, 1 = RTS/CTS]
Select serial communication handshaking protocol.</td></tr>
<tr><td>/G[0|1][CR]</td><td>I2C General Call Control [0 = Disabled, 1 = Enabled]
Enables/Disables iPort/AFM response to I2C Bus General Call (00) messages.</td></tr>
<tr><td>/H[0|1][CR]</td><td>Hex Only Display Control [0 = Disabled, 1 = Enabled]
Controls display format of received message data.</td></tr>
<tr><td>/Ixx[CR]</td><td>Set iPort/AFM's Own I2C Slave Address
Sets iPort/AFM's own I2C Slave Address. iPort/AFM will respond to I2C Bus messages sent to this address.</td></tr>
<tr><td>/K[0|1|2|3][CR]</td><td>I2C Bus Clock Rate Control (iPort/AFM Enhanced Feature)
Set I2C Bus Clock Rate Control (0=23, 1=86, 2=100, 3=400 KHz)</td></tr>
<tr><td>/M[CR]</td><td>Command Menu Display
Display iPort/AFM's Command Menu</td></tr>
<tr><td>/N[0|1|A|R][CR]</td><td>iNterrupt Signal Monitor/Control Status (iPort/AFM Enhanced Feature)
Sets Monitor/Control/Status /INT Line. [0=Disable, 1=Enable, A=Assert, R=Release, [CR] = Status]</td></tr>
<tr><td>/O[CR]</td><td>Open I2C Connection
Activates iPort/AFM as an I2C device attached to the bus.</td></tr>
</table>

/*Rn[CR]	**Master Read Message** Read the specified number of data bytes from the current Destination I2C Slave device. * = No Stop for Repeated Start
/Stext[CR]	**Slave Transmit Message** Write the specified data bytes to a requesting I2C Master Receiver device.
/*Ttext[CR]	**Master Transmit Message** Master Transmit the specified data bytes to the current Destination I2C Slave device. * = No Stop for Repeated Start
/Un[CR]	**I2C Bus Time-oUt (iPort/AFM Enhanced Feature)** Set the I2C Bus Time-oUt in msec (0=Disable)
/V[CR]	**Display Firmware Version (iPort/AFM Enhanced Feature)** (Major XX.XX Minor) (NEW for Version 2.0 or later)
/X[CR]	**Extended Commands (iPort/AFM Enhanced Feature)** Direct control of I2C Clock (SCL) and Data (SDA) lines. See User's Guide for details.(NEW for Version 2.0 or later)
/Y[CR]	**Display Tx Byte Count (iPort/AFM Enhanced Feature)** How many bytes did slave acknowledge? (NEW for Version 2.0 or later)

TYPICAL APPLICATIONS

- **Product Development:** Software/Hardware Testing and Troubleshooting.
- **Manufacturing**: Testing and Debugging, EEPROM Programming, Quality Control.
- **Field Service**: Field diagnosis, Repair service and Verification, Product Updates.

Included Parts List

- iPort/AFM Host Adapter.(#MIIC-203)
- Power Supply (#MWT-5VAG).
- DB-9 Serial Port Adapter Cable.(#C9F25M1)
- 4 Ft. long I2C Interface Cable (iPort I²C Connector Information).(#CAB4)
- 1 Ft. /INT-Trigger Cable (#AXM-12G)
- iPort I2C Utility Pack for Windows.
- User's Guide. (MIIC-203-UG.pdf)
- FREE Technical Support (via phone, fax, or email)

Optional Add-On Parts

- I2C ESD and Over-current Protection Device. (#IPROTX)
- I2C Low Voltage Level Translator. (#IVOLT)
- I2C Interface Cables 4, 8, 16 Ft.(#CAB4 , #CAB8 , or #CAB16).
- I2C Clip Lead Cable (#CABCL)
- I2C Prototyping Board (#IP-101).
- 4 Channel I2C Multiplexer Board (#IP-201).
- LabVIEW Driver Library (#202-SDKW-LV)