



33.5  
35.7  
32.2  
30.9  
28.6

# ErgoTech IOT Solutions

Using TransSECS, ErgoSIS, MIStudio and ErgoTech's Technology to Create Industrial IOT Solutions.



# ErgoTech's IOT Vision

- Flexible, extensible toolset to support IOT in manufacturing.
- Wide support for different industries – SECS/GEM, IEC61850, PLCs, etc.
- Support for web technologies and mobile devices.



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# ErgoTech Systems, Inc.

**Business Intelligence Integration**  
AI, TensorFlow, Statistics, ELK



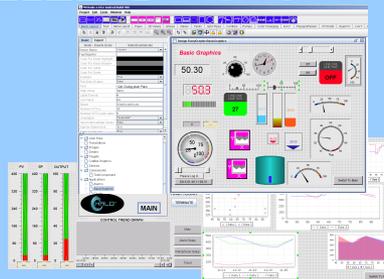
**Smart Mobile For Consumer & Visualization**  
HTML5, Sensors, QR Codes, NFC



**Cloud Intelligence**



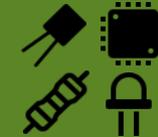
# MIStudio



**Micro Grid & Building Automation**  
Modbus, Siemens, BACnet



**Semiconductor & Electronics Assembly**  
SECS/GEM



**Local Intelligence**



**Smart Grid & Generation**  
Modbus, Switchgear, IEC61850

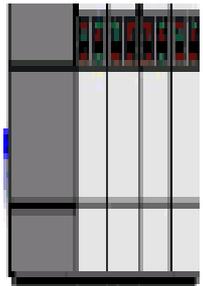


**Manufacturing & Factory Automation**  
PLCs, OPC,



# SECS Connection Y-Tap

Tool



Only One SECS/GEM Connection is allowed at the Tool

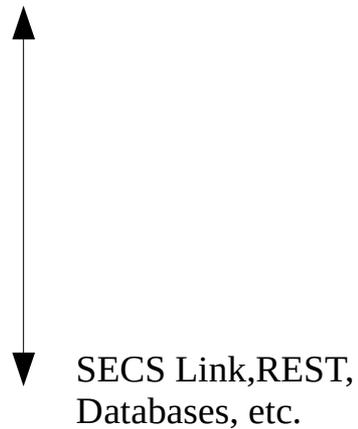
Messages Pass Through Main Link



FAB Host



Data Extracted To Side Link



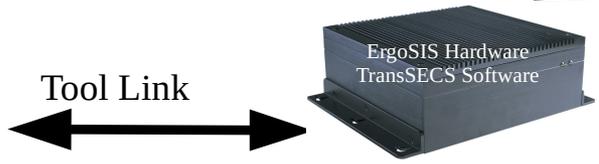
# TransSECS/ErgoSIS

Existing Host



Unchanged  
SECS/GEM  
Communications

Tool



Tool Link  
SECS/GEM



LOT Data

Part-by-Part Production  
(Event) Data

Process (Trace) Data  
Collected during processing

Alarm Management



Remote Drive  
Eg Log Files



MES



Databases



## Configuring ErgoSIS – TransSECS Editor

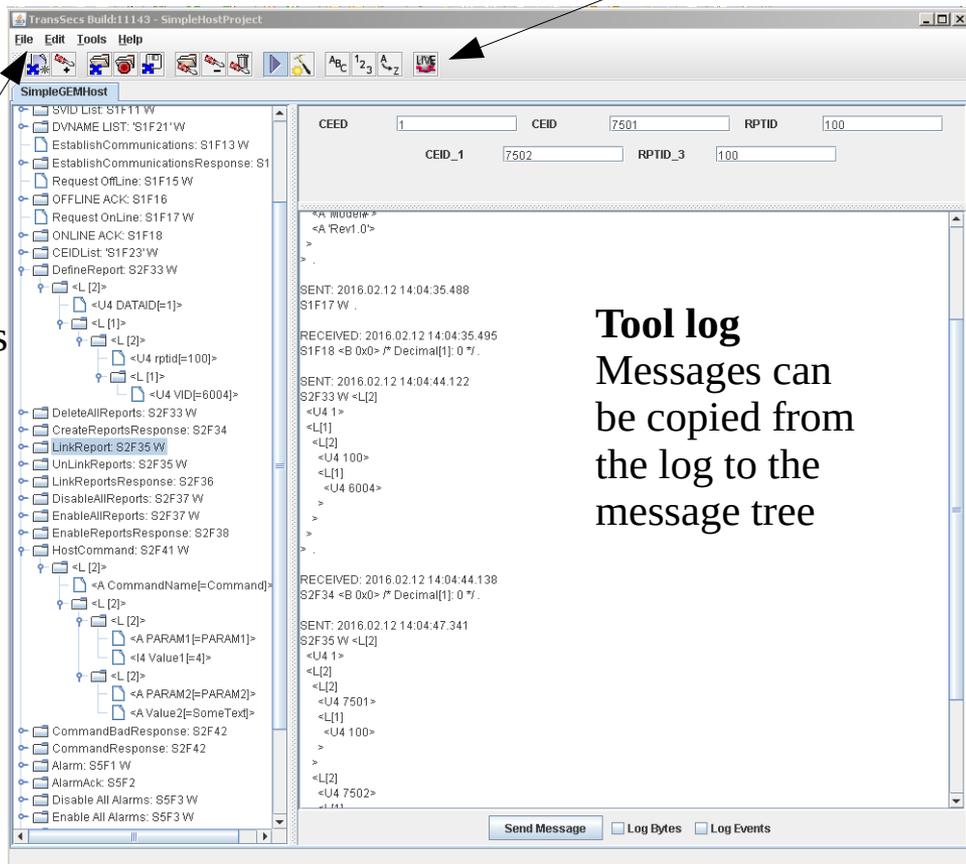
- Graphical SECS/GEM Configuration
- Support for Host and Equipment
  - Easy simulation creation for Host testing
- Integration with OPC, Java, Scripting, etc.
- Integration with MIStudio for HMI, Web, Databases, etc.

# TransSECS Editor

## Graphical Editing of SECS/GEM messages

Live to the tool, the TransSECS simulator or work offline.

Import Logs



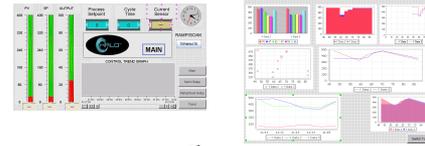
**Tool log**  
Messages can be copied from the log to the message tree

Easily go from the generic GEM standard to the specific tool interface. Also supports non-GEM tools, custom messages and strange SECS interfaces.



# ErgoSIS Features

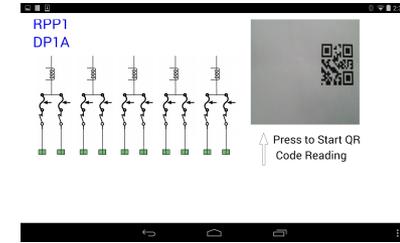
These features are all enabled by ErgoTech's MISTudio



Web Views



Mobile Support



Mobile has potential to be more than just web-views. ErgoTech integrates sensors and the camera for a full IOT experience.



Remote Drive  
Eg Log Files



MES



Databases

## Introducing MIStudio

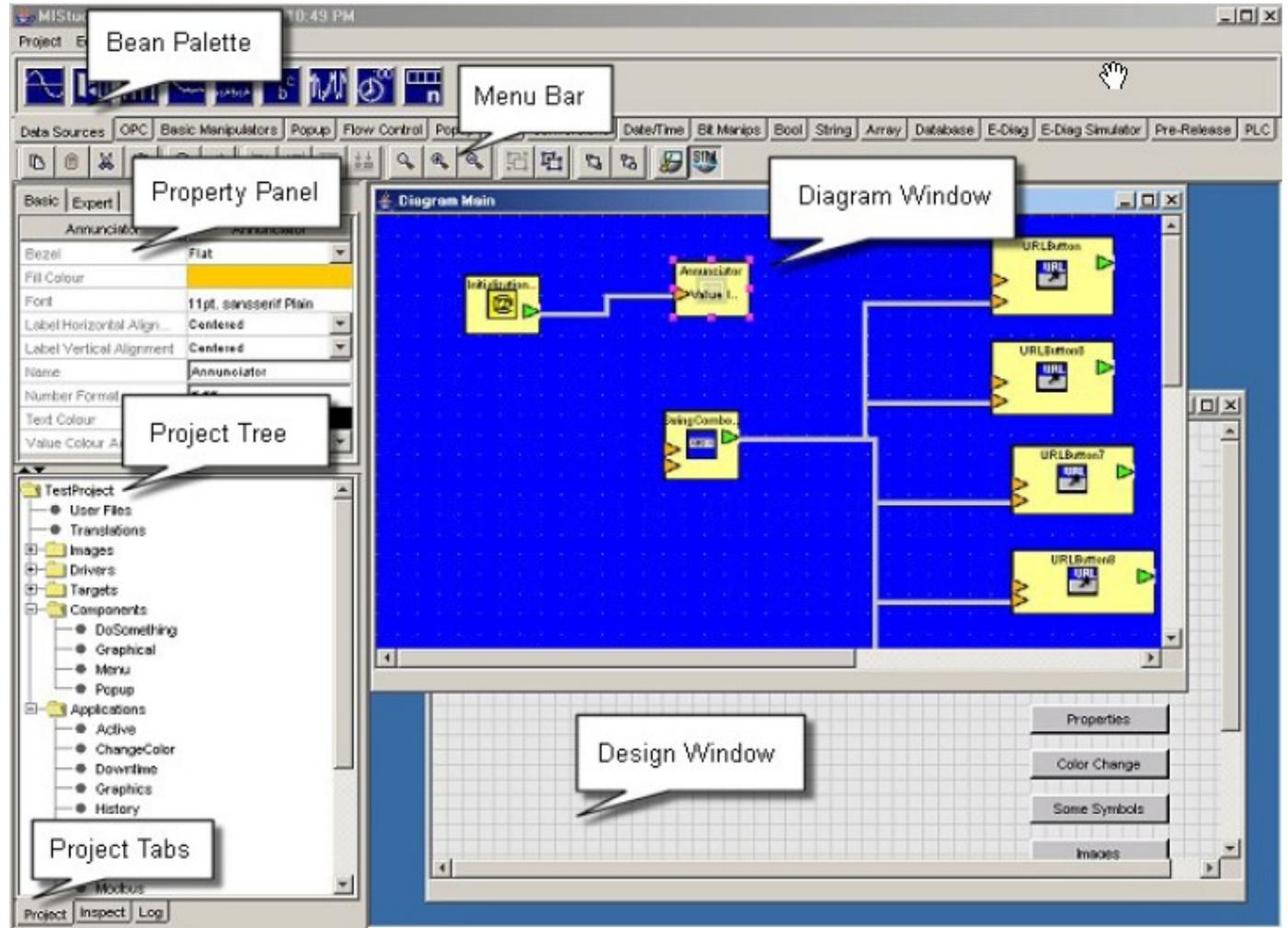
ErgoTech's Manufacturing  
Intelligence and Productivity  
Solution Software from



“An open standards, platform and  
device independent productivity  
solution”

# MIStudio - Integrated Development Environment

- A graphical tool used to design, create, and deploy Manufacturing Intelligence applications



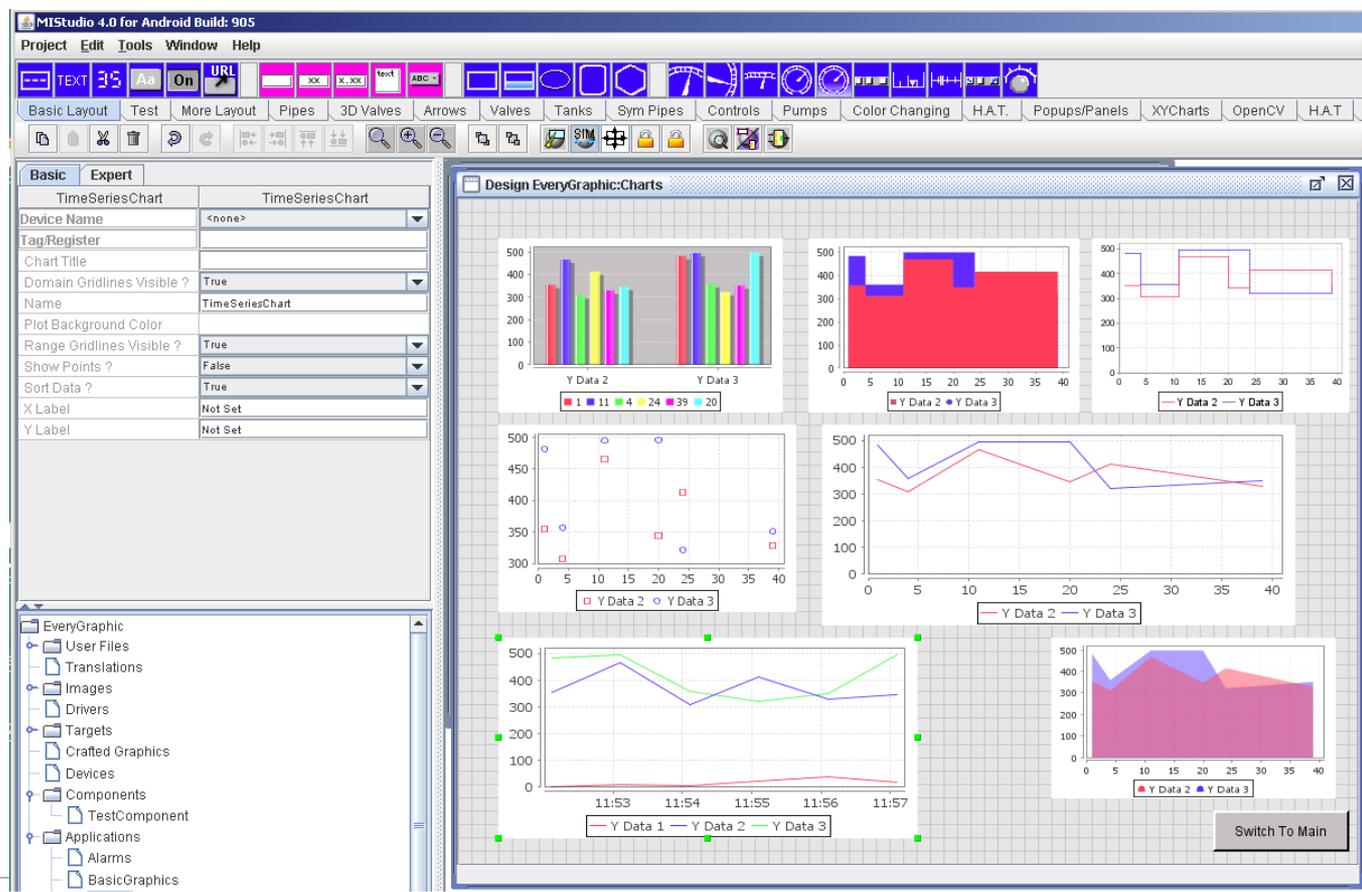


# MIStudio – Product Overview

- 1. Integrated Design Environment, IDE, Software Toolkit
  - Create Real-Time, Web-enabled Manufacturing Intelligence applications
  - Targeted at Engineers, not just Programmers
- 2. Component Library
  - 300 + Visual and Logic Components
  - Charting
  - SPC, Fault Tracking, Database, etc.
- 3. Runtime Execution Engine - MIX Application Server
  - Can be embedded in application Server
  - Browser (HTML5) views. Mobile/

# MI Studio IDE - Design (Graphic) Window

This is where you design the graphical user interface for the application. This will become the web-view.



The screenshot displays the MI Studio 4.0 IDE interface. The main window is titled "Design EveryGraphic:Charts" and contains several data visualization components:

- Top Row:** A bar chart with multiple colored bars (red, blue, green, yellow, cyan) grouped by "Y Data 2" and "Y Data 3".
- Second Row (Left):** A scatter plot showing data points for "Y Data 2" (red squares) and "Y Data 3" (blue circles).
- Second Row (Right):** A line chart with two lines, "Y Data 2" (red) and "Y Data 3" (blue), showing fluctuating values over time.
- Third Row (Left):** A line chart with three lines: "Y Data 1" (red), "Y Data 2" (blue), and "Y Data 3" (green) plotted against time from 11:53 to 11:57.
- Third Row (Right):** A stacked area chart showing the cumulative values of "Y Data 2" (red) and "Y Data 3" (blue) over time.

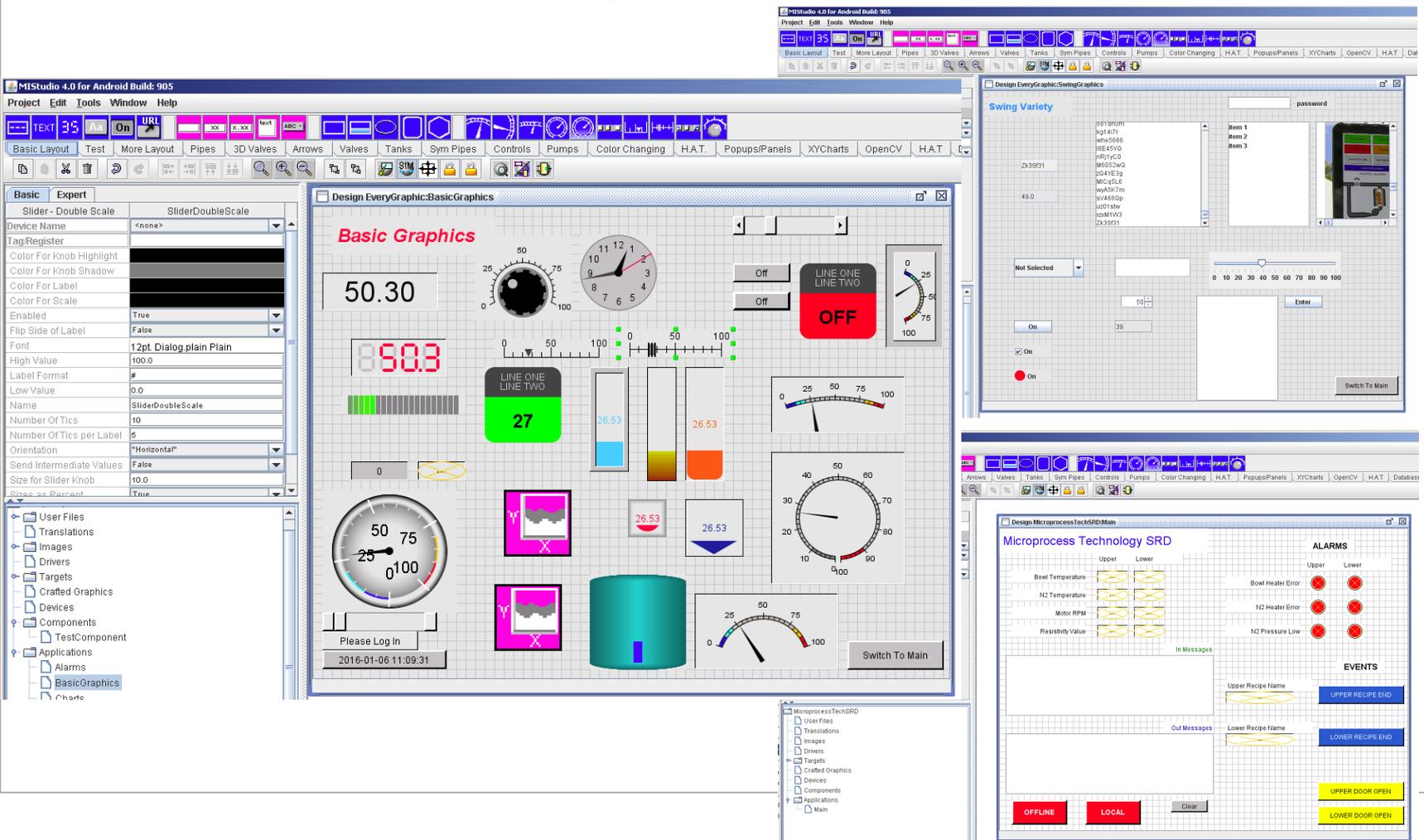
On the left side, there is a "Basic" property panel for a "TimeSeriesChart" with the following settings:

Device Name	<none>
TagRegister	
Chart Title	
Domain Gridlines Visible ?	True
Name	TimeSeriesChart
Plot Background Color	
Range Gridlines Visible ?	True
Show Points ?	False
Sort Data ?	True
X Label	Not Set
Y Label	Not Set

At the bottom left, a tree view shows the project structure under "EveryGraphic", including folders for "User Files", "Translations", "Images", "Drivers", "Targets", "Crafted Graphics", "Devices", "Components", "TestComponent", "Applications", "Alarms", and "BasicGraphics". A "Switch To Main" button is located at the bottom right of the design window.

# MI Studio IDE - Design (Graphic) Window

Provides a wide selection of display components



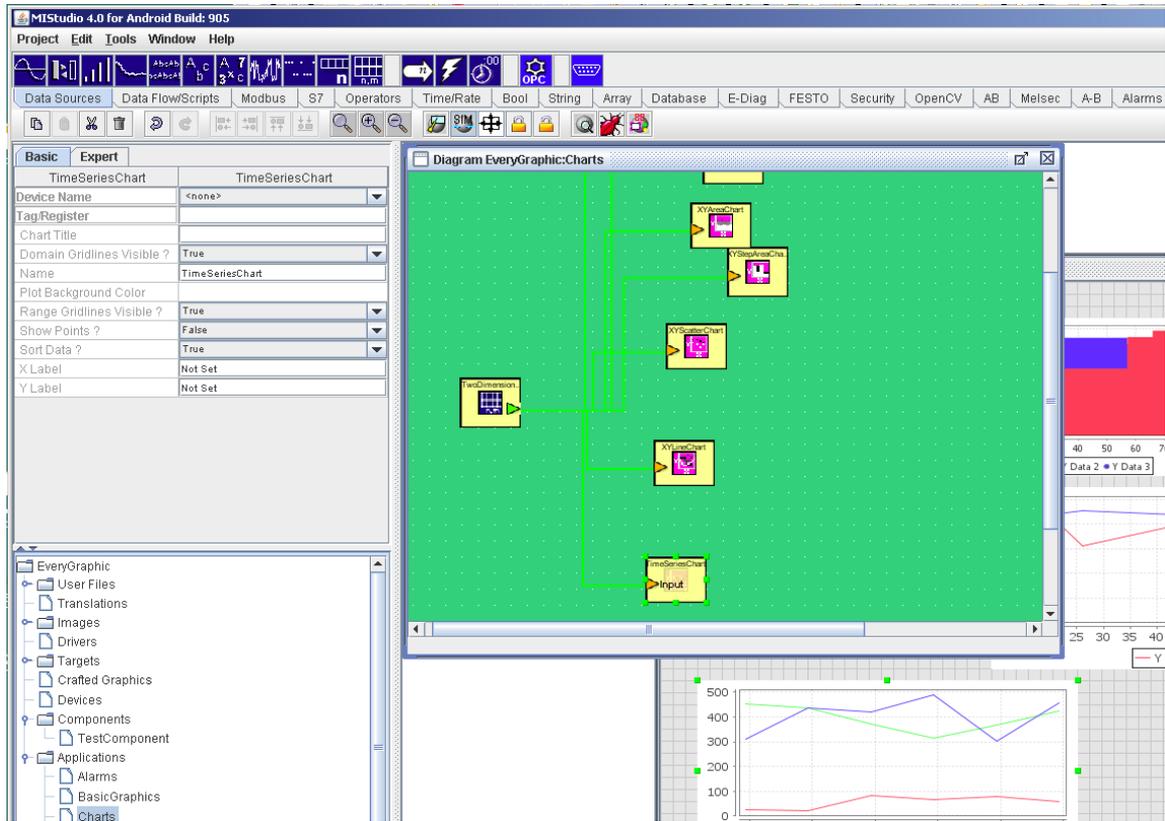
The screenshot displays the MI Studio IDE interface for designing a graphical user interface. The main workspace is titled "Design EveryGraphic:BasicGraphics" and contains several UI components:

- Basic Graphics:** A central area with various widgets including:
  - A digital display showing "50.30".
  - A gauge with a needle pointing to approximately 40.
  - A red "OFF" button.
  - A slider control.
  - A bar chart with two bars labeled "26.53".
  - A circular gauge with a needle pointing to approximately 25.
  - A "Please Log In" button with a timestamp "2016-01-06 11:09:31".
  - A "Switch To Main" button.
- Left Panel (Expert/Basic):** A configuration panel for a "Slider - Double Scale" component, showing properties like "Device Name", "Tag/Register", "Color For Knob Highlight", "Font", and "Orientation".
- Right Panel (Design EveryGraphic:SwingVariety):** A design window for a "Swing Variety" component, featuring a list of items (Item 1, Item 2, Item 3), a "password" field, and a "Switch To Main" button.
- Bottom Panel (Design MicroprocessTechSRDMain):** A design window for a "Microprocess Technology SRD" component, showing "ALARMS" (Bowl Heater Error, N2 Heater Error, N2 Pressure Low) and "EVENTS" (UPPER RECIPE END, LOWER RECIPE END, UPPER DOOR OPEN, LOWER DOOR OPEN).

The interface includes a menu bar (Project, Edit, Tools, Window, Help) and a toolbar with various design tools. A file explorer on the left shows the project structure, including folders for "User Files", "Translations", "Images", "Drivers", "Targets", "Crafted Graphics", "Devices", "Components", "TestComponent", "Applications", "Alarms", "BasicGraphics", and "Charts".

# MI Studio IDE - Diagram (Logic) Window

Each Web View has a Diagram Window where components are wired together to create the desired logic execution and display



The screenshot displays the MI Studio IDE interface. The main window is titled "Diagram EveryGraphic:Charts" and shows a logic diagram on a green background. The diagram consists of several components connected by green lines:

- An "Input" component at the bottom left.
- A "TwoDimension" component at the top left.
- Four "XYLineChart" components arranged vertically in the center.
- Two "XYAreaChart" components at the top right.
- A "YStackedArea" component at the top right.

On the left side, there is a "Basic" tab for a "TimeSeriesChart" component. The properties are as follows:

Property	Value
Device Name	<none>
Tag Register	
Chart Title	
Domain Gridlines Visible ?	True
Name	TimeSeriesChart
Plot Background Color	
Range Gridlines Visible ?	True
Show Points ?	False
Sort Data ?	True
X Label	Not Set
Y Label	Not Set

At the bottom right, there is a data table and a line chart. The data table is:

X	Data 2	Y	Data 3
40			
50			
60			
70			

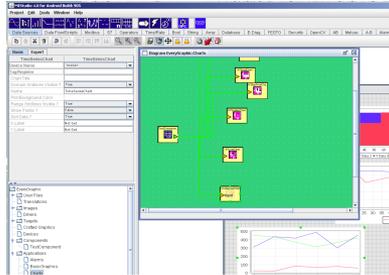
The line chart below the table shows three data series: a blue line, a red line, and a green line, plotted against the X-axis values.



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# MI Studio IDE - Diagram (Logic) Window

Uses Data Received in Real-Time or from databases



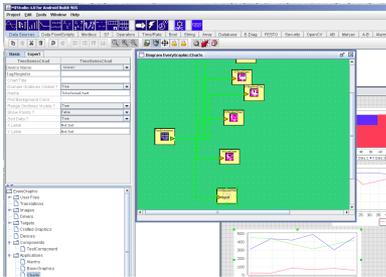
- Connect to Display on Web
  - Chart Values
  - Text
  - Panels, etc.
- Execute Logic
  - If/then
  - Greater Than/Less than
  - Timed (has it been > 5 seconds)
  - Etc.
- Databases
- SPC
- Scripting
  - Almost unlimited possibilities



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# MI Studio IDE - Diagram (Logic) Window

Interacts With  
SECS/GEM in Real Time



- Stop Lot
- Generate Alarm
  - Operator Messaging
  - Pause Tool
- Change Tool State
- Etc.

# Logic Components - SPC and Trending

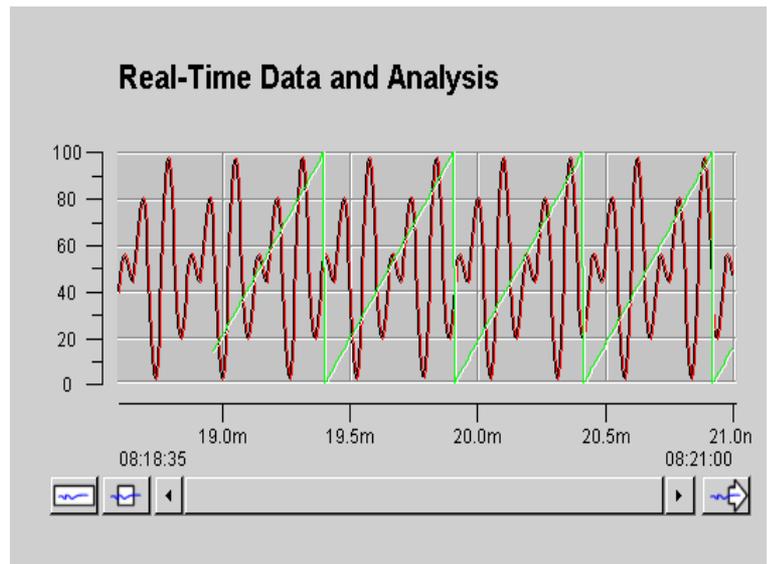
- SPC Analysis Components

SPC	$C_p$	$C_{pk}$	LCL	$P_p$	$P_{pk}$	R	$\sigma$	$\sigma_{est}$	UCL	$\bar{X}$	$\bar{\bar{X}}$
Data Sources	OPC	Basic Manipulators		Flow Control		Math	Conversions	Rate/Counting	Date/Time		
Bit Manips	Bool	String	Array	Diagnostics	Database	Trending	Alarms	SPC	PLC	Serial Port	ErgoVU

- Historical and Trend Viewing Components

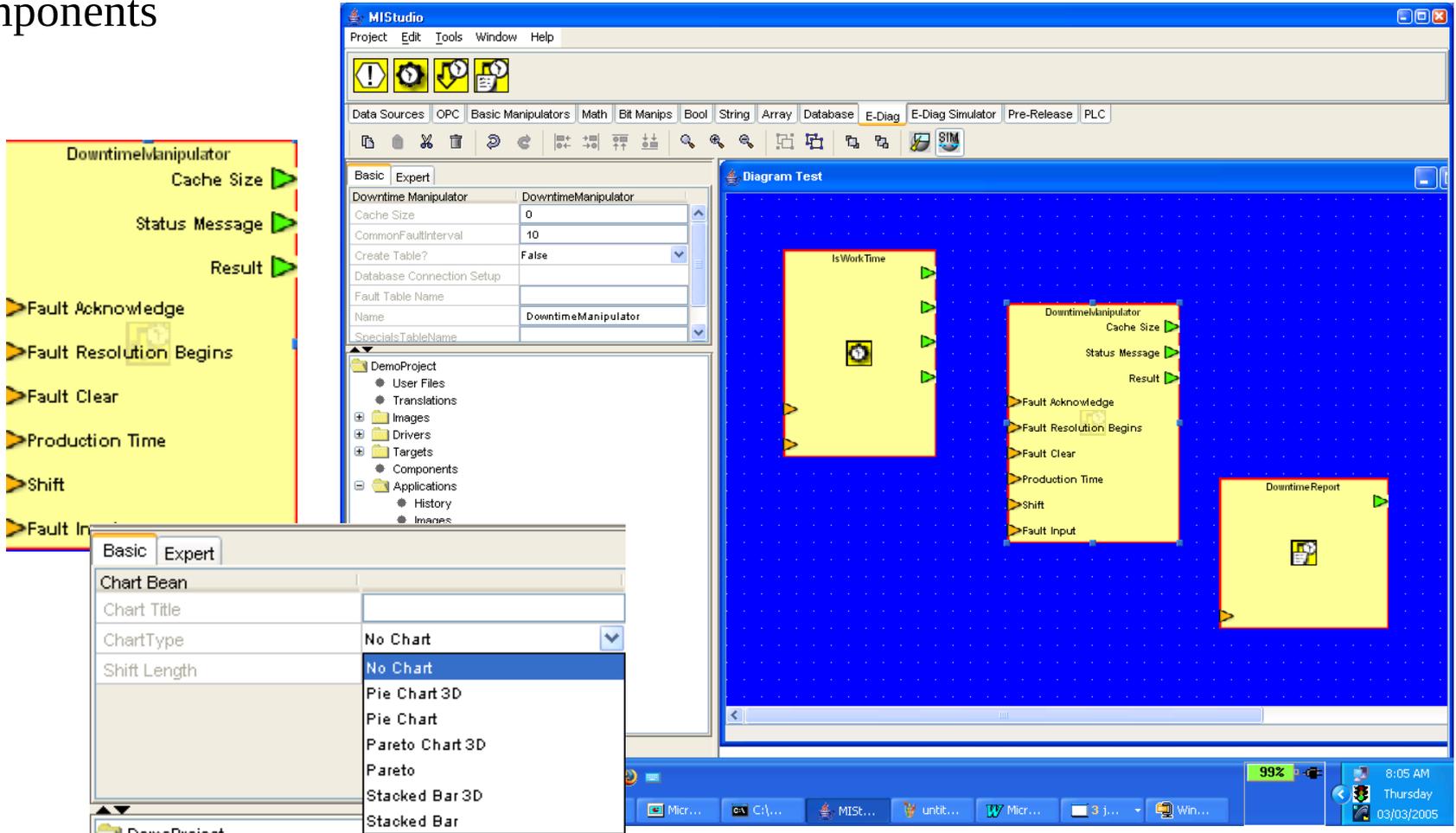
The 'Customize' dialog box allows configuration for four traces (Trace 0 to Trace 4). Key settings include:

- Attached Server List:** Text input field.
- Decimal Formatter:** Input field with '0'.
- Axis Color:** Color selection (currently 'Color').
- Use Trace Color:** Selected radio button.
- Draw Shadow:** Selected radio button.
- Use Active Color:** Unselected radio button.
- Axis Visible:** Unselected radio button.
- Trace Style:** Input field with 'Line'.
- add Line:** Button to add a new line.
- add Step H->V:** Input field with '100'.
- add Step V->H:** Input field with '0'.
- add Bar:** Input field with '10'.
- remove:** Input field with '2'.
- Margin:** Input field with '0'.
- Major Tic Length:** Input field with '11'.
- Minor Tic Length:** Input field with '7'.
- Offset:** Input field with '0'.



# Logic Components – Fault Tracking

## Fault Tracking, OEE and Machine Downtime Analysis Components



The screenshot displays the MISTudio software interface. On the left, a vertical list of logic components is shown, including:

- DowntimeManipulator
  - Cache Size
  - Status Message
  - Result
- Fault Acknowledge
- Fault Resolution Begins
- Fault Clear
- Production Time
- Shift
- Fault In

The central pane shows the 'Basic' tab of the 'Downtime Manipulator' component configuration:

Property	Value
Cache Size	0
CommonFaultInterval	10
Create Table?	False
Database Connection Setup	
Fault Table Name	
Name	DowntimeManipulator
SpecialTableName	

The right pane shows a 'Diagram Test' window with a blue background. It contains three logic components: 'IsWorkTime', 'DowntimeManipulator', and 'DowntimeReport'. The 'DowntimeManipulator' component is expanded to show its internal properties: Cache Size, Status Message, Result, Fault Acknowledge, Fault Resolution Begins, Fault Clear, Production Time, Shift, and Fault Input.

A 'Chart Bean' dialog box is open in the foreground, showing the 'Expert' tab with the following settings:

Property	Value
Chart Title	
ChartType	No Chart
Shift Length	No Chart

The Windows taskbar at the bottom shows the system tray with 99% battery, the date Thursday, 03/03/2005, and the time 8:05 AM.



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# Logic Components - Report Generation

- Reports Components (PDF, CSV, HTML, Excel)

MISstudio Test Build 4-July-2005 03:24 AM

Project Edit Tools Window Help

Data Sources: Math, Conversions, OPC, Date/Time, BACnet, Bit Manips, Bool, String, Array, Database

Basic Manipulators: [Icons]

Basic | Expert

SimpleReport	SimpleReport4
Background Color	
Data Font	10pt. Monospaced.plain F
Date Format	d MMM yyyy HH:mm:ss
Intercolumn Gap	14
Label Font	<b>12pt. Dialog.bold</b>
Maximum Report Age	24h
Name	SimpleReport4
Number Format	0.0000
Orientation	Landscape
Outline Color	
OutputFormat	PDF
Page Footer	Tablet Press , Inc.
Page Header	Real time Parameters
Paper Size	Determined by Locale
Report Footer	End Of Report
Report Header	Real-Time Parameters Repor
Report Name	SpecialReport
Row Height	15

Diagram History

```
graph LR; Button[Button] --> HistoricalDatabaseSe[HistoricalDatabaseSe...]; HistoricalDatabaseSe --> SimpleReport4[Simple Report4 Output];
```



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# Logic Components - Report Generation

Real-Time Parameters Report				
Reading Time	R1	F1	I1	S12
18 Jul 2005 19:07:27	46.0000	49.0000	20.0000	23.0000
18 Jul 2005 19:07:57	52.0000	50.0000	79.0000	22.0000
18 Jul 2005 19:08:27	50.0000	49.0000	38.0000	74.0000
18 Jul 2005 19:08:57	54.0000	50.0000	97.0000	70.0000
18 Jul 2005 19:09:27	49.0000	51.0000	56.0000	45.0000
18 Jul 2005 19:09:57	49.0000	49.0000	15.0000	51.0000
18 Jul 2005 19:10:27	51.0000	50.0000	74.0000	41.0000
18 Jul 2005 19:10:57	49.0000	50.0000	33.0000	19.0000
18 Jul 2005 19:11:27	54.0000	50.0000	93.0000	50.0000
18 Jul 2005 19:11:57	53.0000	48.0000	52.0000	96.0000
18 Jul 2005 19:12:27	48.0000	48.0000	11.0000	69.0000
18 Jul 2005 19:12:57	46.0000	50.0000	71.0000	9.0000
18 Jul 2005 19:13:27	49.0000	50.0000	30.0000	17.0000
18 Jul 2005 19:13:57	45.0000	51.0000	90.0000	68.0000
18 Jul 2005 19:14:27	46.0000	49.0000	49.0000	75.0000
End Of Report				

18-Jul-2005 19:14:44

Tablet Press , Inc.

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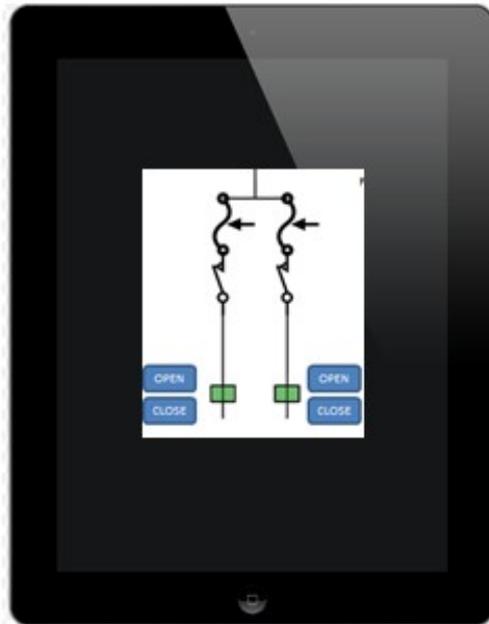


# QR Codes – Scratching the surface of Mobile

Put labels on tools, wiring, etc. Scan the code go directly to the page with the details.



Use simple labels to switch between views



Mobile has revolutionized the consumer space. What can it do in Manufacturing/IOT? It's so much more than a simple view.