



**NKK**  
SWITCHES



**Switching to More Reliable  
Touch Screens**

**NKK TOUCH PANEL SOLUTIONS**  
FT series / TP02 series

**NKK SWITCHES CO., LTD.**

# Switching to More Reliable Touch Screens

NKK SWITCHES is a world-leading industrial switch manufacturer. Our touch screen products incorporate technologies and innovations which we've accumulated to date and reflect our reputation for quality. We've continued to innovate and evolve on a foundational approach based on resistive films. Particularly in medical and other mission-critical industrial fields, NKK's resistive film touch screens have won high marks for precision, performance, and sensitivity.

## Made to the highest standards in Japan



Manufactured in Japan to consistent standards, NKK's touch screens provide high product quality accompanied by quality service. We select touch screens and LCDs and present optimal customization proposals to meet the needs expressed by our customers. From the design phase to the delivery phase, we offer the flexible approach needed to meet customer requirements. (We accept small batch orders.)

Product Quality

Adaptability

## Touch Screen + Switches Expands the range of convenient solutions.

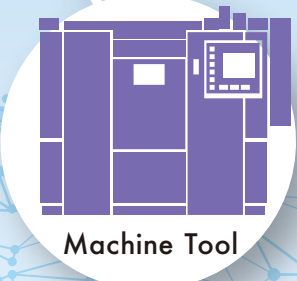
The combination of NKK's touch screen and switches creates various dimensions of added value. We provide performance exceeding expectations to meet a wide range of needs - from optimizing the design of operation panels, cutting costs by procuring the entire panel as an integrated unit and in bulk quantities, and making panel components ever smaller.



Measuring Equipment



Medical Equipment



Machine Tool



Automatic Ticketing Machine



Parking Meter Operation Panel



ATM/POS



Multifunction Printer





# Custom products available on request **Examples**

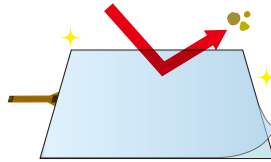
## OCA films

OCA films achieve the screen's full flatness potential and improve screen design. Flat screens also facilitate cleaning. These films eliminate the air layer between the surface sheet and touch screen to improve visibility.



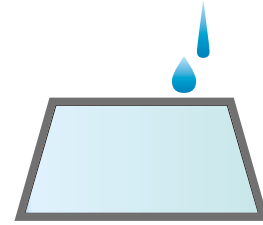
## Fingerprint-resistant/hard coating films

We incorporate fingerprint-resistant films in our touch screens to minimize visible fingerprints and to maintain clarity. We encourage you to contact us if you would like to use other special films.



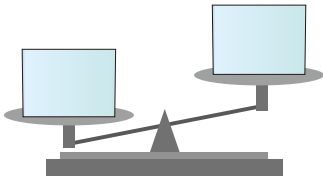
## Water-resistant surface sheets

For applications that may expose the device to water, surface sheets slightly larger than the screen can be applied to keep water out.



## Light weight

For handheld devices and other devices requiring light weight, we offer touch screens based on film + film (digital) rather than film + glass configurations.



## LCD Selection/procurement/attachment

To assure quality, after selecting the optimal LCD for the customer's needs, it is attached to the touch screen in clean rooms at our own facilities in Japan.



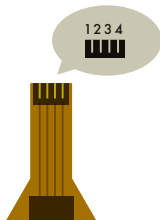
## Double-sided tape

Double-sided tape can be applied to the control surface of the touch screen. Sub-material lining makes it easy to attach the screen to housing without gaps.



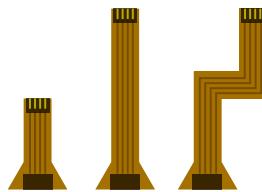
## Tails allow flexible pin assignments

Compatible pin-assignment tails let you migrate smoothly from the current touch screen.



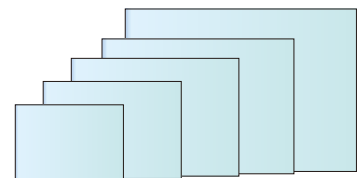
## Exclusively designed tails

We design our own tails, including the selection of parameters like position, length, and shape, to meet customer requirements and requests.



## Various sizes

Base sizes include 3.5", 4.3", 7.9", and 10.1" options to ensure ideal dimensions and to eliminate the need to alter the device design.



# ▶▶▶ Resistive films to expand touch screen possibilities

High sensitivity panels for responsive operation and long service life (Over 10 million touch operations)  
**Series TP02 4-wire analog touch screens**

NEW

**Analog resistive touch screen for high input sensitivity**  
**Continuous response, even with low-pressure sliding actions**

**Remarkable endurance exceeding 10 million touch operations** NEW

The TP02 series offers long service life for integration into devices designed for repeated use.

**High sensitivity for responsive feel** NEW

Ensures responsive performance to input of less than half the pressure required by our earlier products. The TP02 series assures reliable detection of touch operations, even when performed rapidly and in succession.

**Improved contact detection and reliability** NEW

The new surface film material enables accurate, reliable tracing for work involving line drawings or similar work and assures continuous response, even with low-pressure sliding gestures.

**Wide range of input modes**

Our resistive film touch screens responds to all kinds of input, accepting input by finger or pen - and even when wearing gloves.

**Anti-glare surface treatment**

Anti-glare surface treatment reduces glare and reflections from illumination source.

**Adoption of FPC tails**

Incorporation of FPC tails provides high contact reliability for connectors.

**Ideal for narrower LCD bezels**

We've made our touch screen frames narrower to suit thinner bezels.

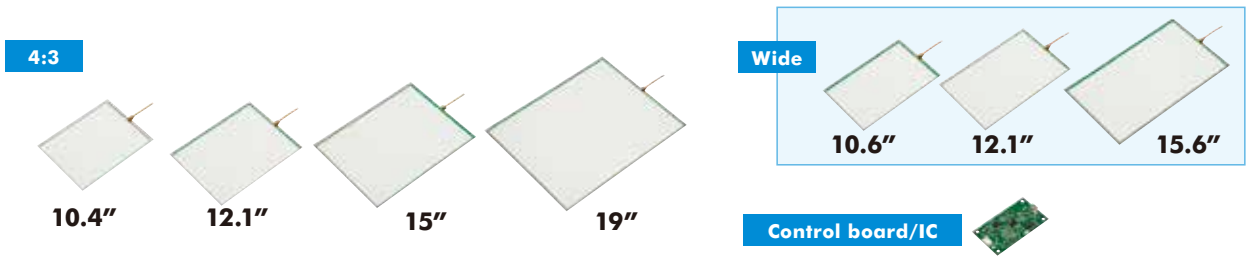
**Hard coating**

Our hard resin coatings provide superb protection for film surfaces against scratches and damage from fingers and input pens.

**Adoption of ANR film**

ANR (Anti-Newton Ring) film reduces interference fringing and improves visibility.

**Product lineup**



Incorporating extensive usage results, based on stable high quality supply chains  
**Series FT digital touch screens**

Screen dimensions to meet a wide range of needs  
**Series FT 4-wire analog touch screens**

**Material composition**

We offer film + glass, which is the configuration currently in widest use.

**Two screen types: analog and digital**

Touch screens come in two types: analog and digital (matrix)

**Anti-glare surface treatment**

Anti-glare surface treatment reduces glare and reflections from illumination source.

**Ideal for narrower LCD bezels**

We've made our touch screen frames narrower to suit thinner bezels.

**Adoption of adhesive**

Use of adhesive on attachment areas with film + glass improves environmental resistance.

**Hard coating**

Our hard resin coatings provide superb protection for film surfaces against scratches and damage from fingers and input pens.

**Standardized FPC tail type**

A gold-plated FPC tail provides high contact reliability. Modified from 8 pins (1.25 mm pitch) to 4 pins (1 mm pitch), the thinner terminal makes the board both smaller and thinner. Customers can choose from a range of surface mount connector options. The material for the tail has changed from PET to polyimide, improving strength (e.g., flex durability) and heat resistance.

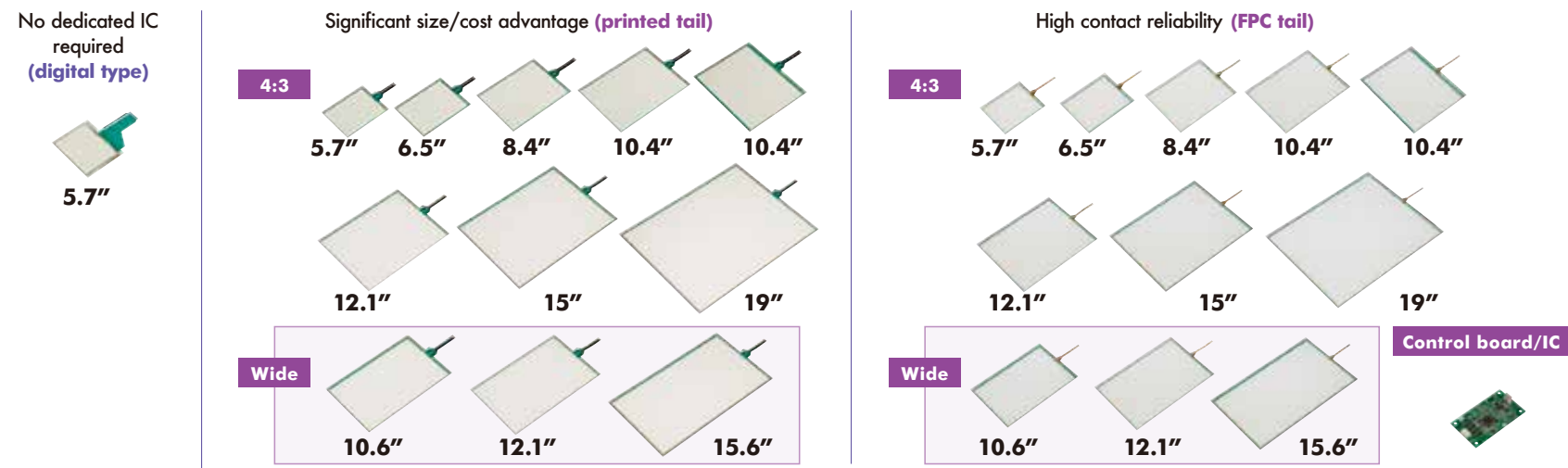
**Adoption of ANR film (analog type)**

ANR (Anti-Newton Ring) film reduces interference fringing and improves visibility.

**Wide range of compatible screen sizes (analog type)**

5.7", 6.5", 8.4", 10.4", 10.6" (Wide), 12.1", 12.1" (Wide), 15", 15.6" (Wide), 19"

**Product lineup**



\* A conversion tail allows handling of 4-wire analog touch screens of any size as 8-wire analog touch screens (auto-calibration function is not supported).



Long-lasting Reliability  
**Series FT 5-wire analog touch screens**

Standard product dimensions are 10.4", 12.1", and 15".

**Improved touch input durability**

5-wire touch screens provide reliable touch detection unaffected by scratches on or other minor wear of the upper electrode film, for improved durability.

**Adoption of FPC tails**

Incorporation of FPC tails provides high contact reliability for connectors.

**Anti-glare surface treatment**

Anti-glare surface treatment reduces glare and reflections from illumination source.

**Adoption of ANR film**

ANR (Anti-Newton Ring) film reduces interference fringing and improves visibility.

**Adoption of adhesive**

Use of adhesive on attachment areas with film + glass improves environmental resistance performance.

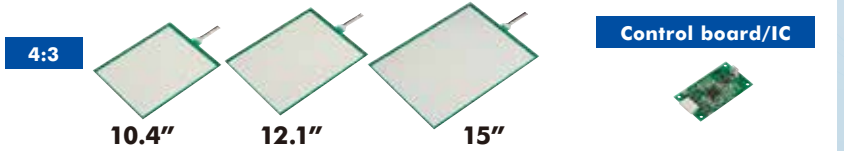
**Hard coating**

Our hard resin coatings provide superb protection for film surfaces against scratches and damage from fingers and input pens.

**Material composition**

We offer film + glass, which is the configuration currently in widest use.

**Product lineup**





# Broadening the World of Touch Screens with Precisely Designed Resistive Film from a Specialist in Industrial Switches

**For operation that feels light to the touch  
For high durability**  
Series TP02 4-Wire Analog

**4:3**

10.4" 12.1" 15" 19"

**Wide**

10.6" 12.1" 15.6"

**For motion-sensitive operation**  
Series TP02 4-Wire Analog

**4:3**

10.4" 12.1" 15" 19"

**Wide**

10.6" 12.1" 15.6"

**Control Board** **IC**

**If dedicated IC is not required**  
Series FT Digital

5.7"

**NKK Supplies  
a Wide Range of  
Touch Screens  
to Meet the  
Needs  
of All Different  
Customers**

**For high durability**  
Series FT 5-Wire/8-Wire Analog

**4:3**

10.4" 12.1" 15"

**Control Board** **IC**

\* The 8-wire analog type is custom-made. All sizes of the 4-wire type support an 8-wire conversion tail.

**For a wide range of sizes and excellent cost performance**  
Series FT, 4-Wire Analog, Printed Tail

**4:3**

5.7" 6.5" 8.4" 10.4" 12.1"

15" 19"

**Wide**

10.6" 12.1" 15.6"

**Control Board** **IC**

**For high contact reliability**  
Series FT, 4-Wire Analog, FPC Tail

**4:3**

5.7" 6.5" 8.4" 10.4" 12.1"

15" 19"

**Wide**

10.6" 12.1" 15.6"

**Control Board** **IC**

\* Specifications presented here are subject to change without prior notice. Check with our sales office for the latest specifications.

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