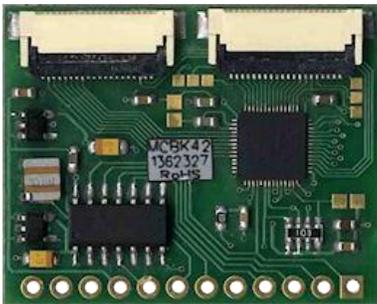


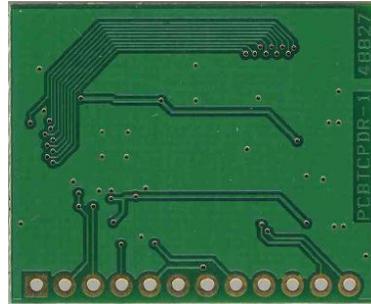
- Easy setup and auto-calibration
- Easy fixing to rear of TFT panel
- Simple 8 byte multi-touch protocol
- Asynchronous serial interface at 115,200 baud
- I2C TWI interface up to 100kHz clock
- 3V3 logic level, 3V3 to 5V power supply

This compact touch controller has been designed to interface to our metallised projective capacitive touch panels with the minimum of setup needed to respond to touches through a 4mm plastic or 8mm glass front panel. Users can also wear many types of gloves.

Module Front



Module Rear



CN1 - Comms

Pin	Function
1	NC*
2	NC*
3	NC*
4	NC*
5	SDA
6	/IRQ
7	SCL
8	/RESET
9	VCC
10	0V
11	SO
12	SI

CN2 - X Outputs

Pin	Function
1	X0
2-18	X1-X17
19	X18
20	NC

CN3 - Y Inputs

Pin	Function
1-4	NC
5	YB
6	Y0
7-19	Y1-Y13
20	YT

Electrical Specification

Parameter	Symbol	Min	Typ	Max	Unit	Condition
Power Supply Voltage	VCC	3.3	5.0	5.5	VDC	GND=0V
Power Supply Current	ICC	15	25	35	mA	VCC=5VDC
Logic High Input	VIH	2.0	3.0	VCC	VDC	VCC=5VDC
Logic Low Input	VIL	-0.4	-	0.66	VDC	VCC=5VDC
Logic High Output	VOH	3.2	-	3.3	VDC	IOH=-10mA
Logic Low Output	VOL	-	-	0.66	VDC	IOL=5mA

Parameter	Value
Operating Temperature	-40°C to +85°C
Storage Temperature	-40°C to +85°C
Operating Humidity	20 to 90% RH @ 25°C non condensing

Jumper Settings

Jumper	Connect	Function
J1	1-2	Connect Y13 to YT
	2-3	Connect YT to 0V
J2	1-2	Connect Y0 to YB
	2-3	Connect YB to 0V
J4	NC	Internal setup
J11	1-2	Low voltage operation

* NC do not connect internal function

Touch Protocol

Byte	Function
1	00h=release, 01h=press/move
2	touch id: 01h-0Ah
3	X position MSB
4	X position LSB
5	Y position MSB
6	Y position LSB
7	terminator FFh
8	terminator FFh

Combine MSB with LSB to form a 16 bit value (0 - 4095). Divide to suit panel size.

Contact

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Installation

The touch panel should be mounted on to the TFT spacer first then connect the X and Y flexi cables to CN2 and CN3 of the control module and secure in place on the back of the TFT panel with the touch flexi-cables at least 2mm from other TFT flexi cabling or the TFT metal frame. Topside solder a connecting cable to CN1 and link to the port designated for touch control. It is recommended to power the module from 5V if possible to reduce CPU noise.

Operation

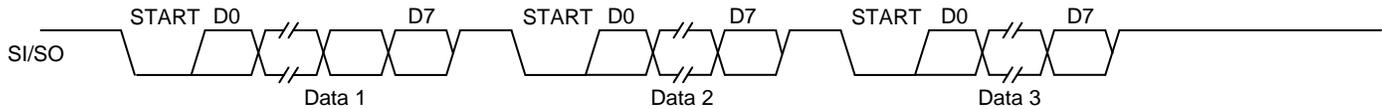
At power on or after the reset input is set high, the touch controller will auto-calibrate using existing threshold parameters. This takes about 2 seconds during which the panel should not be touched. Touch events are then transmitted as an 8 byte package according to the protocol table. Example: 01H,01H,01H,FFH,00H,7FH,FFH,FFH

The host CPU will need to store data in variables or in an array of structures depending on the touch sophistication required for the application. During development, the X and Y position values should be calibrated according to the size of the panel and will need division to relate this to pixels on the display, see table below for typical division values.

Subject to change without notice.
IUK Doc Ref49204 Iss: 1, 14 Oct 2014

Asynchronous Serial Interface (MCBK42-AS)

The asynchronous serial interface is 3.3V logic suitable for connection to a standard microcontroller port. Ensure that the power supply for the touch controller and the host rise at the same time.



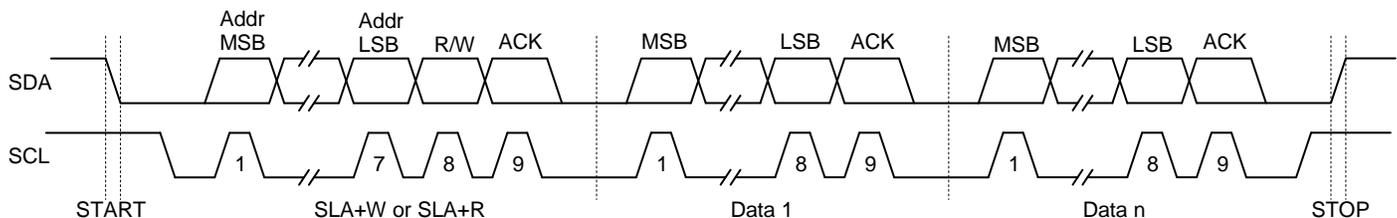
Baud rate options (on pins 5, 6, 7 of CN1)

115200 no links (default)
 38400 link 5-6
 19200 link 6-7

Custom baud rate, parity, protocol and setup parameters can be supplied to meet your application requirements. Simply send an email with your request.

I²C TWI Serial Interface (MCBK42-I2C)

The I²C TWI interface operates in slave mode as a two wire interface. The maximum speed is 100K bits per second subject to inter-connection. The two wire interface uses standard ports of a CPU and will require external open collector buffers if connecting to a true I2C bus.



A START condition is signaled by driving SDA low while SCL is high. A STOP condition is signaled by driving SDA high while SCL is high. After a START condition is detected by the slave followed by 'SLA+W' with the 7 bit address (default 4Bh) and Read/Write from the master, the slave signals acceptance by raising the ACK bit. When a STOP condition is detected the data received is processed.

The /IRQ signals the host that touch data is available to read. When not active, the port is set high.

Typical coordinate division values

Panel Size	X	Y
480x272 (4.3")	5.68	15.06
640x480 (5.7")	TBC	TBC
800x480 (7")	4.05	8.53

Sensitivity configuration

The touch threshold can be set by sending the following data :-

55h AAh 01h XXh where XXh is the touch threshold value (typically 08h – 19h, default = 0Ah).

Multitouch configuration

Maximum number of reported touches can be set by sending the following data :-

55h AAh 02h XXh where XXh is the maximum number of reported touches (01h – 0Ah, default = 02h).

Part number detail

MCBK42-AS115 Async interface with default baud rate of 115200
 MCBK42-I2C I2C / TWI interface with default address 4Bh

Guidance for Using Capacitive Touch Systems

Capacitive touch systems are sensitive to power supply noise and proximity to metal objects.

- 1/ Ensure the supply to the touch controller is not subject to excessive ripple >100mV
- 2/ Keep away from high magnetic fields or high currents as used in spot welders (30Amps)
- 3/ Keep metal objects at least 2mm distance from the conductive tracks and foil of the touch sensor.
- 4/ Ensure adjacent metal objects are connected to 0V or grounded.
- 5/ Ensure air gaps between metallised capacitive touch panels and front panel do not exceed 0.5mm
- 6/ If using the touch panel without a front panel cover, ensure the user is aware of glass precautions.
- 7/ Consider user interface solutions to prevent accidental touch in critical applications – use 2 finger touch or passcode.
- 8/ Take care not to touch the front panel during the first 3 seconds after power on / reset during auto calibration.
- 9/ Ensure the front panel is thick enough to prevent severe impact damaging the touch sensor.

Please email our technical group for specific advice at tech@noritake-iron.com