ภาคผนวก ก
คู่มือการใช้งานอุปกรณ์

Scottech
www.scottech.net

OTT C31 Universal Current Meter

Description

The original C31 OTT Current Meters set the standard for flow measurement in rivers, open canals, etc. and without them hydrometry is not imaginable.
OTT Current meters mean thousandfold proven quality, precision and reliability - worldwide for decades. The rotation rate of the precisely calibrated propeller is proportional to water velocity.

- C31 Universal Current Meter is designed for flow metering in combination with hand-held wading rods or cable suspended from a bridge or boat. Different accessories like sounding weights (middle pieces), sounding reels (winches), cable ways etc. allow the setup of a complete flow monitoring station.

Advantages

- Cost reduction owing to low maintenance requirements and simple, inexpensive handling.
- The robust construction and high-quality materials allow operation even under difficult conditions with high accuracy.
- Low starting speed due to robust ball bearings.
- Reinforced meter spindle

Examples of use

The OTT Universal Current Meter C31 is used for measurement of water velocity:

- Universal application on different fixing devices, as rod-mounted current meter or as suspended version with single-drum winch in combination with a bridge jib/measurement trolley or with double-drum winch in combination with a cable-way installationh.
- Calibration and cyclical control of flow velocity and discharge measuring equipments.
- Efficiency tests of power station turbines (cross brace).

Technical Data

Flow velocity	from 0.025 m/s to 10 m/s
Current meter reed relay contact	1 pulse/revolution lifetime > 1 million contacts switches
Operating voltage range	max. 9V DC
Magnetic switch	pressure-tight up to 30bar
Material- meter body	brass - gal Ni 8mt
Material - propellor	gal Ni 12 high gloss alternative -plastic - Hostaform C , yellow
Size dia. x length up to tip of propeller	ø35 x 310mm
Weight w/o propellor	1.26 kg

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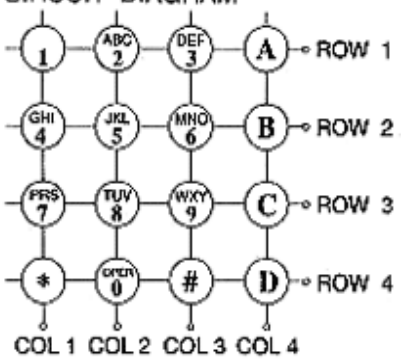
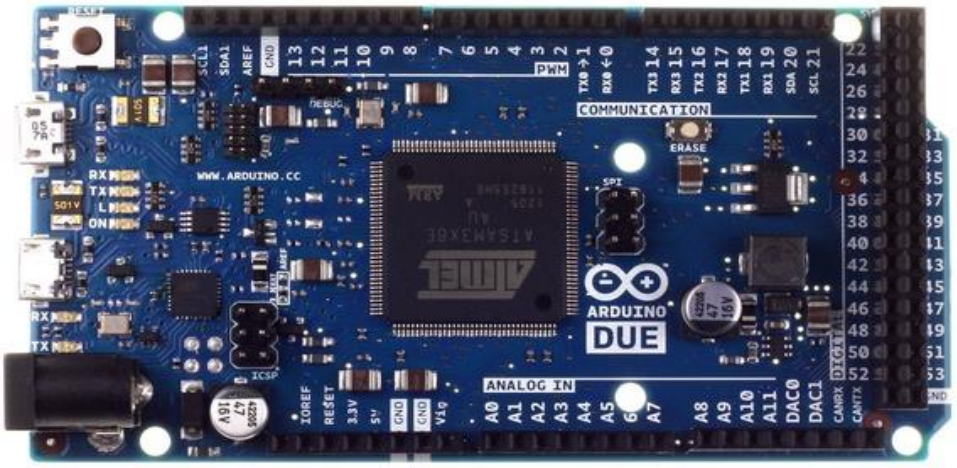
CIRCUIT DIAGRAM



OUTPUT ARRANGEMENT	
OUTPUT PIN NO.	SYMBOL
1	COL 1
2	COL 2
3	COL 3
4	COL 4
5	ROW 1
6	ROW 2
7	ROW 3
8	ROW 4



Microcontroller	AT91SAM3X8E
Operating Voltage	3.3V
Input Voltage (recommended)	7-12V
Input Voltage (limits)	6-16V
Digital I/O Pins	54 (of which 12 provide PWM output)
Analog Input Pins	12
Analog Output Pins	2 (DAC)
Total DC Output Current on all I/O lines	130 mA
DC Current for 3.3V Pin	800 mA
DC Current for 5V Pin	800 mA
Flash Memory	512 KB all available for the user applications
SRAM	96 KB (two banks: 64KB and 32KB)
Clock Speed	84 MHz
Length	101.52 mm
Width	53.3 mm
Weight	36 g

DS3231

Extremely Accurate I²C-Integrated RTC/TCXO/Crystal

General Description

The DS3231 is a low-cost, extremely accurate I²C real-time clock (RTC) with an integrated temperature-compensated crystal oscillator (TCXO) and crystal. The device incorporates a battery input, and maintains accurate timekeeping when main power to the device is interrupted. The integration of the crystal resonator enhances the long-term accuracy of the device as well as reduces the piece-part count in a manufacturing line. The DS3231 is available in commercial and industrial temperature ranges, and is offered in a 16-pin, 300-mil SO package.

The RTC maintains seconds, minutes, hours, day, date, month, and year information. The date at the end of the month is automatically adjusted for months with fewer than 31 days, including corrections for leap year. The clock operates in either the 24-hour or 12-hour format with an AM/PM indicator. Two programmable time-of-day alarms and a programmable square-wave output are provided. Address and data are transferred serially through an I²C bidirectional bus.

A precision temperature-compensated voltage reference and comparator circuit monitors the status of V_{CC} to detect power failures, to provide a reset output, and to automatically switch to the backup supply when necessary. Additionally, the $\overline{RST}$ pin is monitored as a pushbutton input for generating a µP reset.

Benefits and Features

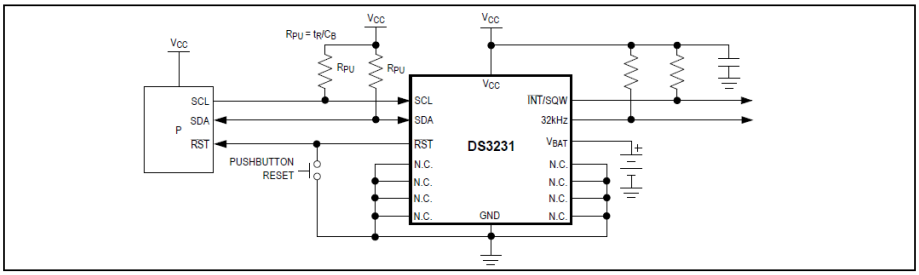
- Highly Accurate RTC Completely Manages All Timekeeping Functions
  - Real-Time Clock Counts Seconds, Minutes, Hours, Date of the Month, Month, Day of the Week, and Year, with Leap-Year Compensation Valid Up to 2100
  - Accuracy ±2ppm from 0°C to +40°C
  - Accuracy ±3.5ppm from -40°C to +85°C
  - Digital Temp Sensor Output: ±3°C Accuracy
  - Register for Aging Trim
  - $\overline{RST}$ Output/Pushbutton Reset Debounce Input
  - Two Time-of-Day Alarms
  - Programmable Square-Wave Output Signal
- Simple Serial Interface Connects to Most Microcontrollers
  - Fast (400kHz) I²C Interface
- Battery-Backup Input for Continuous Timekeeping
  - Low Power Operation Extends Battery-Backup Run Time
  - 3.3V Operation
- Operating Temperature Ranges: Commercial (0°C to +70°C) and Industrial (-40°C to +85°C)
- Underwriters Laboratories® (UL) Recognized

Applications

- Servers
- Telematics
- Utility Power Meters
- GPS

Ordering Information and Pin Configuration appear at end of data sheet.

Typical Operating Circuit



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19-5170; Rev 10; 3/15

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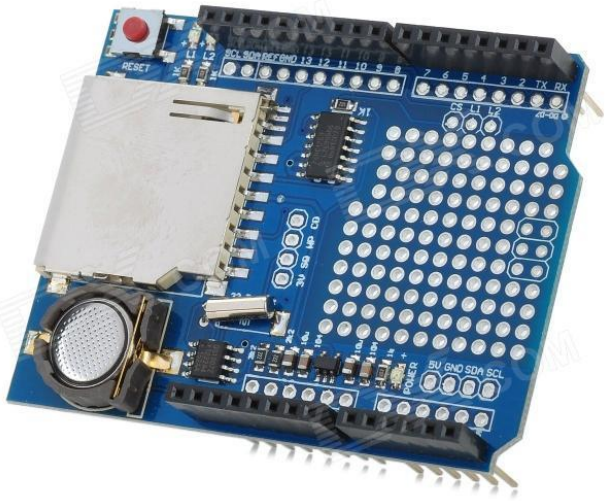

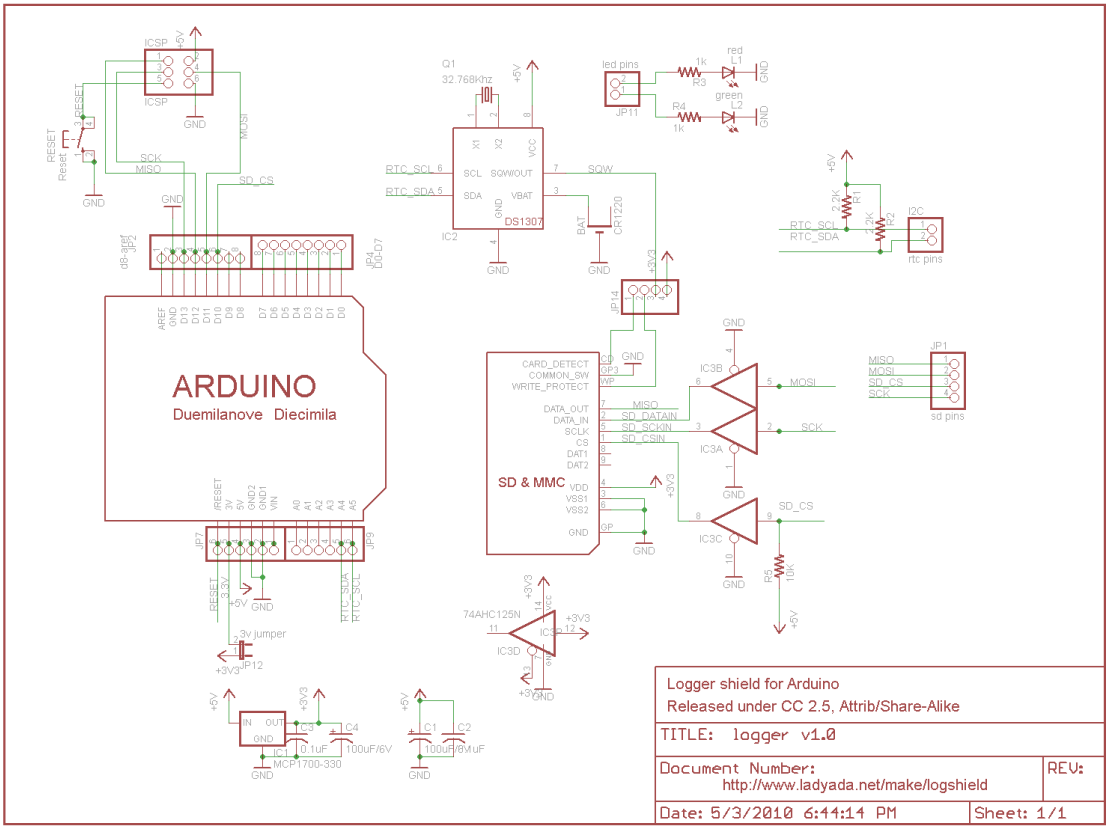
ARDUINO
Duemilanove Diecimila
SD & MMC
DS1307
74AHC125N
MCP1700-330
Logger shield for Arduino
Released under CC 2.5, Attrib/Share-Alike
TITLE: logger v1.0
Document Number:
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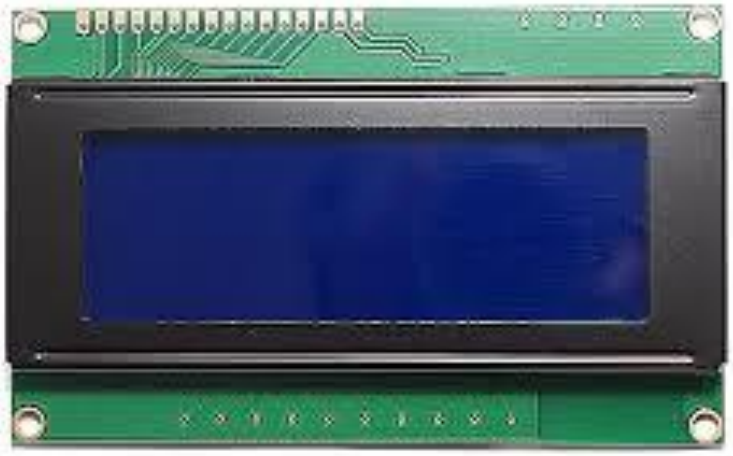


ABSOLUTE MAXIMUM RATINGS

Item	Symbol	Min.	Max.	Unit
Supply Voltage(Logic)	Vdd - Vss	-0.3	7.0	V
Supply Voltage(LCD)	Vdd - V0	-0.3	13.0	V
Input Voltage	Vi	-0.3	Vdd + 0.3	V
Operating Temp.	Topr	0	50	°C
Storage Temp.	Tstg	-10	60	°C

MECHANICAL DATA

Item	Max.	Unit
Module Size (W X H X T)	98.0 X 60.0 X 13.5	mm
Viewing Area(W X H)	76.0 X 26.0	mm
Character Size(W X H)	2.95 X 4.75	mm
Dot Size(W X H)	0.55 X 0.55	mm
View Angle	6 or 12 O'Clock	

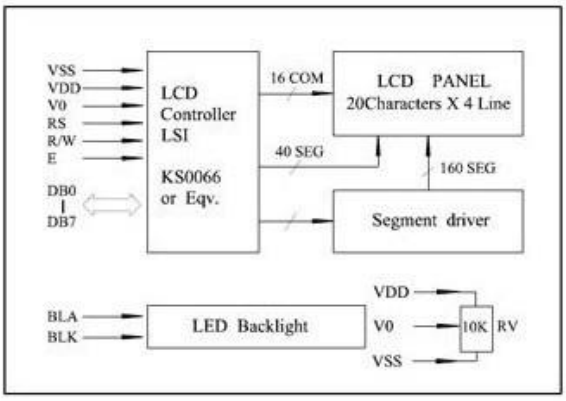
ELECTRICAL CHARACTERISTICS (Vdd=5V± 0.25V)

Item	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Input High Voltage	Vih	--	2.0	--	Vdd	V
Input Low Voltage	Vil	--	-0.3	--	0.8	V
Output High Voltage	Voh	Ioh=-0.2mA	2.4	--	Vdd	V
Output Low Voltage	Vol	Iol=-1.6mA	0	--	0.4	V
Supply Current	Idd	Vdd=5.0V	--	2.0	3.0	mA
LCD Driving Voltage	Vdd - V0	Ta=25 °C	--	4.7	--	V

PIN CONNECTIONS

Pin	Symbol	Level	Function
1	VSS	0V	Power GND
2	VDD	+5V	Power supply for logic
3	V0	--	Operation voltage for LCD
4	RS	H/L	H:Data L:Instruction code
5	R/W	H/L	H:Read L:Write
6	E	H/L	Enable signal
7	DB0	H/L	Data bus line
8	DB1	H/L	
9	DB2	H/L	
10	DB3	H/L	
11	DB4	H/L	
12	DB5	H/L	
13	DB6	H/L	
14	DB7	H/L	
15	BLA	+5V	Power supply for LED backlight
16	BLK	0V	

BLOCK DIAGRAM

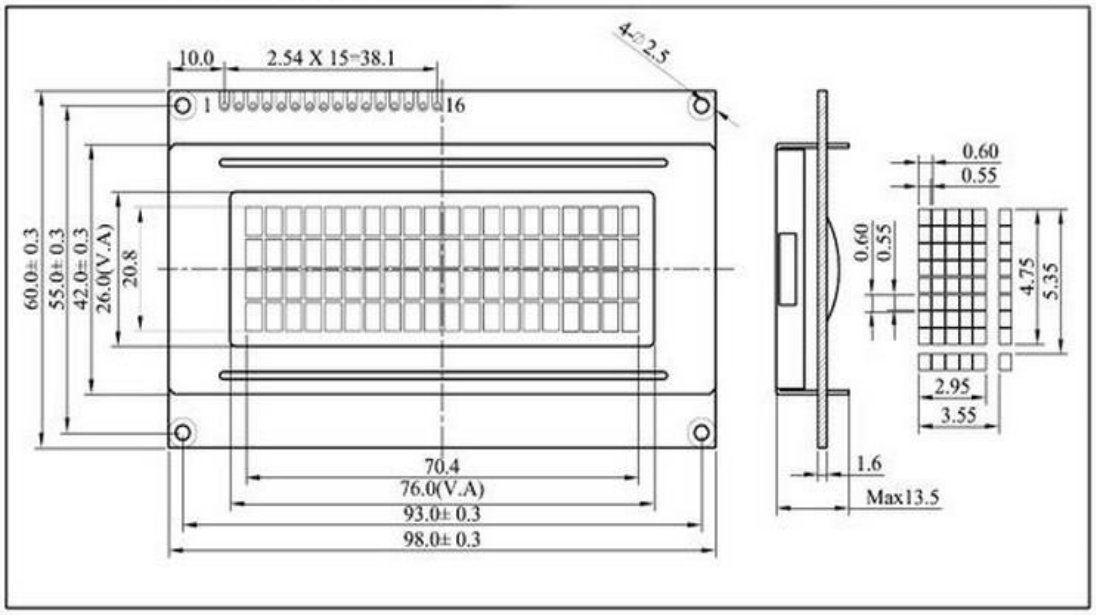


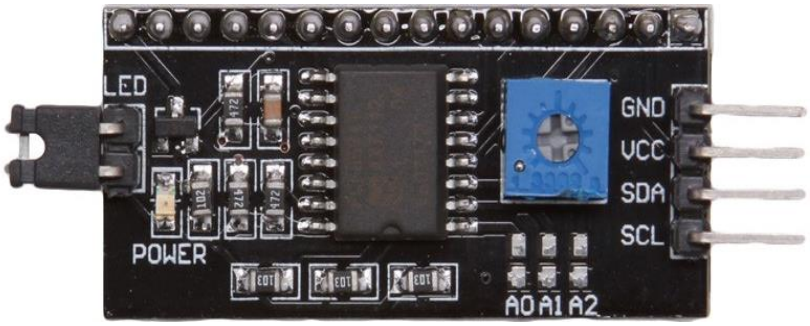
LCD Type

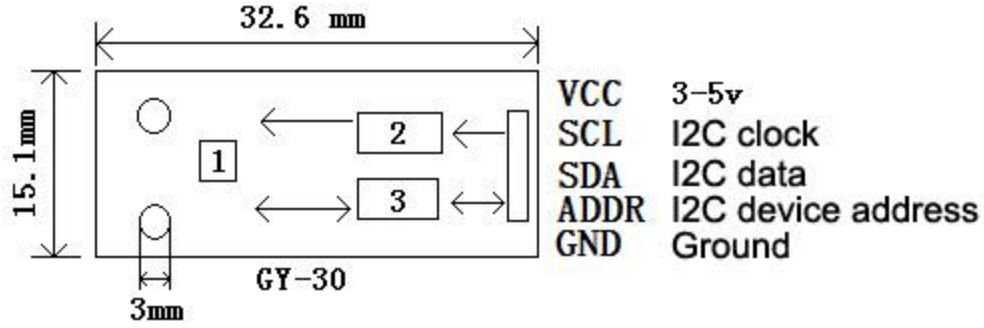
LCD Color	Blacklight
Yellow Green	LED/Yellow Green/4.2V (≤250mA)
Blue	LED/White /3.2V (≤150mA)

2004A

*20Characters X 4Line 1/16duty 1/5bias







1 BH1750FVI

2 Low-power 3.3V regulator (3-5V compatible)

3 Level conversion