



CR391/U Manual

Revision 113

09 Nov 2022



Revision History

Version	Date	Person	Reason For Changes
001	2014-10-01	MTL	Match CR390 FW v1.46. Library functionality mode to document CR39x.Library.manual.doc
001a	2014-11-21	MTL	Correct configuration drawing
002	2014-12-2	MTL	FW Version 2.
005	2015-01-15	MTL	FW Version 5. Correct number of cards and buffer sizes.
009	2015-04-18	MTL	FW Version 9. Add updating
00B	2015-07-21	MTL	FW Version B.
00D	2015-08-26	MTL	FW Version D.
00G	2015-09-15	MTL	FW Version F. Serial reader
00I	2015-12-05	MTL	FW Version I. Remove Ethernet cable when doing factory reset
00K	2016-06-06	MTL	FW Version K.
00L	2016-07-12	MTL	FW Version L, Bootloader 1.12, I/O map to match Lib V01Z
00Q	2018-10-11	MTL	FW Version Q. Add serial link (ComP to interface)
012	2018-11-01	MTL	FW Version 012 Add Universal options
112	2022-07-06	MTL	Sync to Universal 112
113	2022-11-09	MTL	Correct power supply spec

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1 SCOPE

This manual contains all information on the Softcon products CR391 and CR391U control panels (hereafter referred to as the CntrP). Options only available on CR391 are indicated in **green square brackets []** and only for CR391U in **red curly brackets { }**.

CR391U is an updated CR391 printed circuit board (PCB) and is smaller, with additional onboard options.

This document contains the following:

- General product specifications.
- Detail technical specifications.
- Installation instructions.
- Operators manual.
- Parts lists.
- PCB versions.
- FW versions.

2 WARNINGS AND CAUTIONS

The CntrP poses no hazard to the user of such equipment if installed correctly. The controller is powered by 110 or 220/240 VAC and should therefore always be kept locked with the transformer plate screwed into place. The **[Two fuses]** **{one fuse}** on the PCB are rated at 2 amps and should never be exceeded. All supply voltages, environmental specifications, as well as general specifications should be considered when installing the controller.

In installations where the equipment effects control, potential hazards may occur, depending on the item being controlled. Correct system design and implementation should eliminate such hazards, e.g. installing detection loops under barrier arms.

3 APPLICABLE DOCUMENTS

All information specific to the CntrP is included in this document.

Functionality of the CntrP is listed in the document CR39x.Library.manual.doc. The library manual lists all functions available in Softcon products and a functions table specifies the controllers that are enabled for each function.

The CntrP settings can be programmed using the CR374, CR375 or CR395 programmer (these also used as front-end interfaces for reader, display and key-pad). Throughout this document, these programmers are referred to as hand held programmers (HH). The HH booklet (SCS_CR39x.HH.booklet.pdf) describes the use of the HH. The functions table in the HH booklet (same as the functions table in the library manual) lists what controllers are enabled for each function.

Lid inserts [SCS_CR391.lid.pdf] and {SCS_CR391U.lid.pdf} are installed in the product lid, are included here as appendixes.

The PC SW manuals are available for information on the LAN systems. All documents are available on WWW.softconserv.com

CR390, CR391/4, CR391, CR391U compatibility

The CR391U (PCB version 803.x) is an updated CR391 and the CR391 is an updated CR390 CntrP, each containing all functions of the previous versions, with the additions as below. CR391U has replaced all previous versions, the Legacy versions of HW have been discontinued.

All versions of the CntrP PCB can run the legacy or universal versions of FW. Legacy modes of FW are to be discontinued.

The CntrP is manufactured in different configurations where certain components are omitted. The BareBones version does not contain TCP or USB features and is similar to the CR355 controller in I/O and communication functions.

HW additions to CR391 and CR391U are:

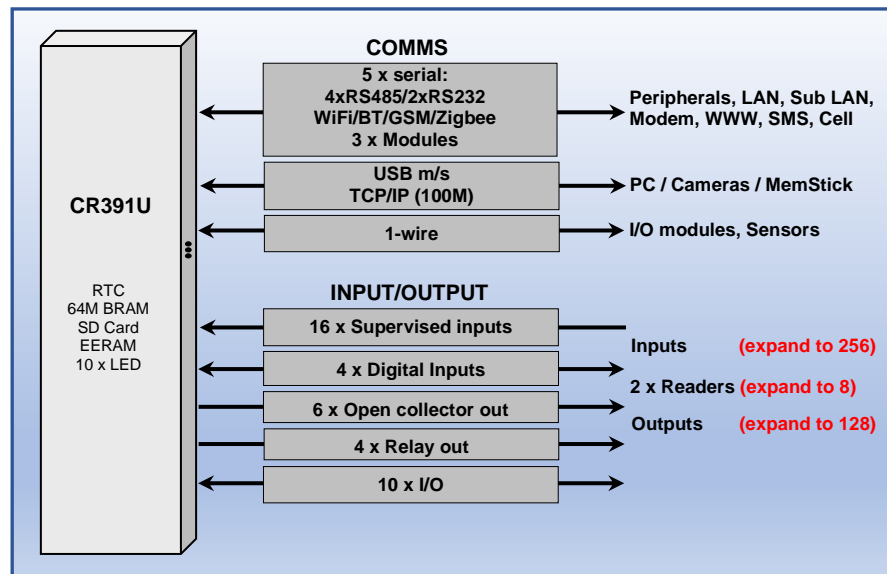
FUNCTION	CR391	CR391U
Single PCB with surface mount components	Yes	Yes
USB slave. Connect to PC.	Optional	Optional
USB master. Connect to peripherals, memory sticks	Optional	Optional
TCP 100M	Yes	Yes
Serial ports	5	5
GSM, WiFi/BlueTooth	Modules	Optional onboard / modules
Zigbee	Modules	Optional onboard / modules
1-wire I/O expansion	No	Yes

Using adapter plates, the CR391U can be installed in the CR391 housing. CR391 does not fit in the moulded CR391U housing.

Both can be programmed with the same firmware (FW), running legacy or universal options.

4 GENERAL SPECIFICATION

An intelligent Access Controller of one to eight entry points, via Card Readers and/or Keypads (with Data/clock, Wiegand, Dallas Touch or serial interfaces) utilized in stand-alone mode or integrated into on-line PC based systems. Also functions as a Cash Loader, a LAN manager, I/O (intrusion, PLC) and Vending controller.



4.1 SYSTEM FUNCTIONS

- Stand-Alone or System-Integrated
- Token- Card- Finger reader to output control
- Inputs (contacts, temperature, etc.) to output control
- Real Time Clock, time-out and counting control
- Intrusion – DENIS® does ABC (integrates with all I/O)
- Vending cashless control: I/O, Access, MDB/Exec protocols
- Vending machine management DDCMP/DEX/UCS protocols
- Cash loader
- On-board www
- Integration / configuration of all functions to requirement

4.2 ACCESS FUNCTIONS

- Anti-pass back, anti-time back control, expire
- Batch loading of void and valid cards
- Adjustable latch and door open detection timeouts
- Vehicle detect provides reader enable and vehicle APB
- Egress / override facility
- Card capture, motorized reader / capture interface
- Multiple illegal entry attempts disable reader
- Multiple integrated random search
- Mantrap
- Output groups
- Link external data (via serial) to card (e.g. weight)

4.3 VENDING / CASH-LOADER FUNCTIONS

- Cashless vending – free / quantities per period / subsidies / pre-paid and external payment systems
- Product management with low quantity alarms
- Machine management - alarms / warnings, recipe
- Coin / Note reader

4.4 INPUT/OUTPUT CAPABILITIES, FUNCTIONS

- 10 configurable outputs - 4 relay, 6 open-collector
- 16 supervised inputs (short and open circuit)
- Expansion modules (TTL, SPI, RSS485, 1-wire)

Expand to 256 Inputs, 128 outputs

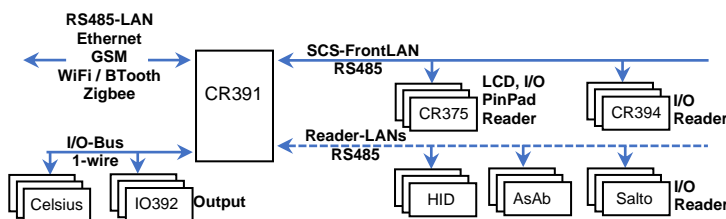
- Built in APPs: Intrusion and Lift-control
- Programmable Logic Control (PLC)
- Timers, counters, triggers and events

4.5 READER INTERFACE

- 2 Card readers (expand to 8 via front-end modules / serial readers)
Data/clock, Wiegand, Touch or serial (RS232 or RS485)
- Pin pads and LCDs – and programmer (via front-ends)
- Sallis Salto / Assa Abloy, OSDP RS485 interface

4.6 COMMUNICATION OPTIONS

- TCP/IP (100M), USB-2 (host and device)
- 5 Serial (2xRS232 / [3] {4}xRS485 / GSM / WiFi / BT / {Zigbee})
- LAN controller (TCP / USB / GSM / WiFi / RS485)
- 3 Serial expansion modules (GSM / WiFi / BT / PLD / 20mA)
- GSM – SMS / Clip / APN / Cloud
- I/O expansion (A2D, Output)
- 1-Wire to 8 Output, 8 Digital Thermometers
- Communications encrypted
- Bootloader FW update



4.7 CABLE TYPE AND LENGTH

Reader to CR391:	8-core multi-strand Mylar, 0.2 mm, with screen.	50 m maximum.
FrontP to CR391:	2 pair twisted multi-strand Mylar, 0.2 mm, with screen.	2 000m max total length.
Terminal to CR391:	3-core multi-strand Mylar, 0.2 mm, with screen.	20 m maximum.
CR391 to 1-wire modules:	2 Pair twisted multi-strand Mylar, 0.2mm ² with screen.	20m total length.
CR391 to IO 390/1 modules:	8 core multi-strand Mylar, 0.2mm ² .	50cm.
LAN cable:	2 pair twisted multi-strand Mylar, 0.2 mm, with screen.	2 000m max total length.

4.8 HOUSING AND DIMENSIONS

White powder-coated steel enclosure with lock.

255mm (H) x 300mm (W) x 115mm (D), or 315mm (H) x 300mm (W) x 90mm (D) with integrated UPS.

{CR391U:

- ABS-flame retard moulded locked enclosure (integrated UPS)
- 110mm (H) x 300mm (W) x 57mm (D)
- SlideTie® cable entries
- Lid open detect (tamper)}

4.9 ENVIRONMENTAL CONDITIONS

Storage Temperature: -20 to 65 degrees C (-46 to 150 degrees F).

Operational Temperature: 0 to 40 degrees C.

Humidity: 80 % non-condensing.

4.10 POWER SUPPLY

90-240 VAC +/- 10% 230 to 270 Watt total power consumption.

Data setup parameters and clock are battery backed-up for 6 years (with power off).

12 VDC (1.5 A) available for latches.

12 VDC (500mA), available for readers.

Integrated UPS option with 7 AH battery, mains monitor.

5 GENERAL INFORMATION

5.1 INTRODUCTION

The CntrP is single 32bit microprocessor-based equipment designed to execute control of one to eight doors, barriers, turnstiles etc. Control of these doors could be via card readers (MAG, prox, touch, infra-red, barcode or Wiegand), PIN-pads or push buttons (egress). The CntrP can be used as a stand-alone unit or in an “on-line” PC based LAN system.

The controller has 16 (expandable to 256) supervised inputs that can be used to monitor potential free contacts (in PC based option), or be set as special function access related inputs.

12 outputs (expandable to 128) are 4 relay and 8 open collector outputs are configured as special function access related outputs or as auxiliary outputs controlled on time and/or by the PC.

The set-up can be set and can be viewed with a hand programmer that is plugged in to the CntrP. When functioning in the Universal mode, the set-up can be set and can be viewed with PC App SCS_Device. In on-line systems, the PC can change the set-up.

A bootloader firmware upgrade function is also available as standard where new firmware can be downloaded to the CntrP via the Ethernet or RS485 connection.

An integrated UPS option of the CntrP is available.

The CntrP can function in one of the Legacy modes or in the universal mode.
Legacy modes:

CR355 and **CR355A** modes differ only in time groups.

CR355 has 15 Access time groups, 15 input time groups, 15 output groups and a time group for each reader and PIN required and each door open time group.

CR355A has 60 time groups (8 time zones per 15 groups) with selection of any time group for any of the functions – Access, reader, PIN, latch, input and output. Note that for CR355A, db2 is limited to 32000 cards. **PC translator type** is set as CR355 or CR355A respectively.

CR351/2/4 mode (previous Softcon access controller), has dedicated special function inputs and outputs, 4 auxiliary inputs and 1 auxiliary output. CR372 and CR374 cannot be connected in this mode. The CR374/5 is used only as a hand programmer.

Vending controller and a **Cash loader** (may require different FW load). The cash mode only functions on-line with the PC. In these modes, the CR374/5 is used as a display.

The controller can perform a variety of functions (details are given in the library manual):

- Access control
- Cash Loader
- Input / Output controller
- LAN manager
- Vending controller

5.2 CONTROLLER

5.2.1 Design and construction

- Materials.** Housing is a white powder coated metal enclosure {or moulded PVC}. CntrP consists of a 1.6mm fiberglass PCB and a power supply PCB/module.
- Radiation.** Radiation falls within the EU and UL requirements and causes no detrimental effect to the surroundings (requires correct earthing). See protection.
- Identification, markings.** Each PCB has a recorded unique serial number in permanent ink and has a PCB version number in white paint.
- Interchange ability.** PCBs are interchangeable.
CR391 use plug-in 3,81mm connectors (7, 10 14 pin).
CR391U use plug-in 3.5mm connectors (10 pin).

5.2.2 Protection

Power supply protection is limited to a mains line filter (Varistor, inductor and capacitor network), with a tranzorb on the secondary winding. The LAN lines are protected with tranzorb. The reader data is opto-coupled. Additional protection must be provided externally where required.

Reader supplies (pin 1 and 4 on the reader connector) that are short-circuit result in the PCBs fuse blowing, opening MAG latches.

All reader inputs have serial 100 ohm protection resistors.
MAG and Wiegand Reader inputs are protected via tranzorbs.

Inputs have tranzorb and an RC network for noise.

5.2.3 Power supplies

The CntrP PCB requires a 12 to 15VDC (600mA).

Supplied housing can contain an integrated UPS with 7AH battery backup (see below). The UPS requires a “clean” power supply 110 to 240 VAC. 3A and 4.5A options are available.

In installations where the power supply fluctuates regularly or dips below 100V AC an external UPS should be installed.

Connecting the CntrP to the same remote mains power supply as a motor and control operating a boom or a roller shutter door, could cause problems because of the excessive mains variations as the motor switched “on” and “off”. Mains UPS or DC UPS (nominally 12VDC to 20VDC) can be utilized. A “clean power supply” is generally available in buildings for computers.

Signal ground must be isolated from earth, i.e. no links between ground and earth (the housing is earthed).

Supplying DC to a CntrP via long cables should be avoided and additional capacitance is generally required at the CntrP when supplying DC.

The relay contacts are rated at 3A 30VDC and 3A 250VAC.

5.2.4 External battery backup unit

When providing DC from external supplies, earth must remain connected via the mains connector or be connected to the earth terminal block provided in the housing.

5.2.5 Integrated UPS

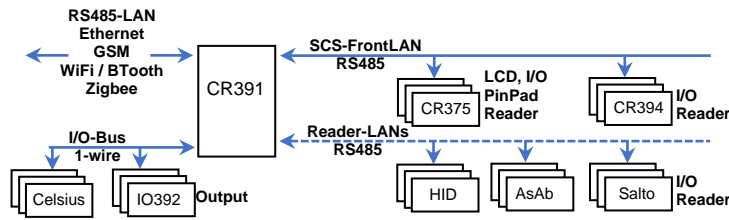
CntrP optionally has an integrated uninterruptible supply (UPS), with a 7 AH battery. This powers the CntrP, readers and latches (only DC latches).

The period that the CntrP can be powered depends on the power consumption of the readers and latches and how often the latches are energized.

The CntrP draws 600mA, proximity readers typically require 100mA each, biometric readers up to 2.5A (external supply required) and latches typically 500mA.

5.2.6 Communication

For functionality and set-up details on the following see the library.



Generally selected port in brackets below.

Peripherals (see peripherals below for connection details):

- Cash loader:** The PCB is linked for TTL when installed in cash loaders.
- HH:** RS485 communication with HH programmer.
- Readers:** Data/clock, Wiegand dual line, single line Dallas (touch) or serial (RS232 or RS485 – single or multi-drop).
- USB (device/slave):** This comms is used for test mode (terminal mode) or for PC / Master comms.
- USB (host/master):** To connect USB peripherals (printers, modems) or devices such as memory sticks.
- Vending and Fuel:** 20mA via plugin module.

PC comms (see PC comms below for connection details):

- Serial to PC:** RS232 (in terminal test mode, in modem app or in PC mode. (Com C).
- Basic serial slave:** RS232/485 Basic ASCII-HEX, space separated, CR terminated strings. (Com C/B).
- LAN Master:** CntrP can be LAN master (and a LAN slave) to 128 slaves – polling the slaves and passing data to the PC (slave to PC). RS485. (Com B).
- LAN Slave:** RS485 polled. CntrP with matching node address receive/send data. (Com B)
- TCP-IP:** 10/100Mb/s baud, half duplex TCP connection to PC, CntrP is Server (gateway not used by CntrP).
IP, Subnet Mask and Port settable via HH or via App SCS_Device (in universal mode only).

5.2.7 Memory

On-board memory is fixed at 4M byte SRAM and 524k byte EEPROM in the uP. RAM allows for up to 125k card database and up to 10000 transaction buffer. Set-up parameters are kept in Electrically Erasable (EE) or Battery Backup (BB) memory and the card database is kept in BB. On power-up the BB memory is checked for a specific pattern and if incorrect the set-up is loaded with defaults, mostly from settings in EPROM as listed in the default set-up below (see HH set-up / default memory).

5.2.8 FW versions

The CntrP program (referred to as FirmWare - FW) resides in the Electrically Erasable Programmable Read Only Memory (EEPROM) device in the uPs.

The version format is Vccc.Illx:

- ccc - Controller specific version (HW drivers, I/O ports, etc.).
- Ill - Library version. All functions and settings (common to Softcon products). Note that certain functions may not be linked in certain ccc versions. See the function table appendix.
- x - For French, a 'F' after the version indicates that displays are in French.
Other languages are available on request.

5.2.9 Reset

The controller has built-in power and time-out watchdog reset circuitry. When the 5V supply drops below 4.8V, the RAM closes to a battery backup state and the microprocessor resets. The time-out watchdog resets the microprocessor if the SW does not perform the time-out clear every second – this reset occurs when the green tick LED flashes on the PCB. These functions are done automatically.

Resetting the CntrP is by powering up the controller.

A memory of the EERAM and SRAM reset (factory reset) can be forced by short circuiting the reset pin on the uP PCB (masked as RESET or TEST – see lid insert) till Rd1 and Rd2 LEDs light up and removed when Rd1 LED off (wait a fraction of a second), Rd2 on.

When the CntrP powers-up with the reset link in, the first reset defaults Serial C to Test. Reset options are available via the HH – see the HH booklet.

It is suggested that in TCP connected controllers, the Ethernet cable be removed before the factory reset is done and only replaced when the correct IP setting have been entered. This eliminates possible problems with certain smart routers that block the port when detecting the default IP address 192.168.100.001.

5.2.10 Micro processors

The uP PCB contains a single 32bit processor (Pic32 795 512L) with IO port expanders.

5.2.11 Durability and reliability

Ruggedization is limited to static use, i.e. not mobile. The mean time between failures is greater than 10 000 hours at 24 hour per day operation within the specified environmental and supply conditions.

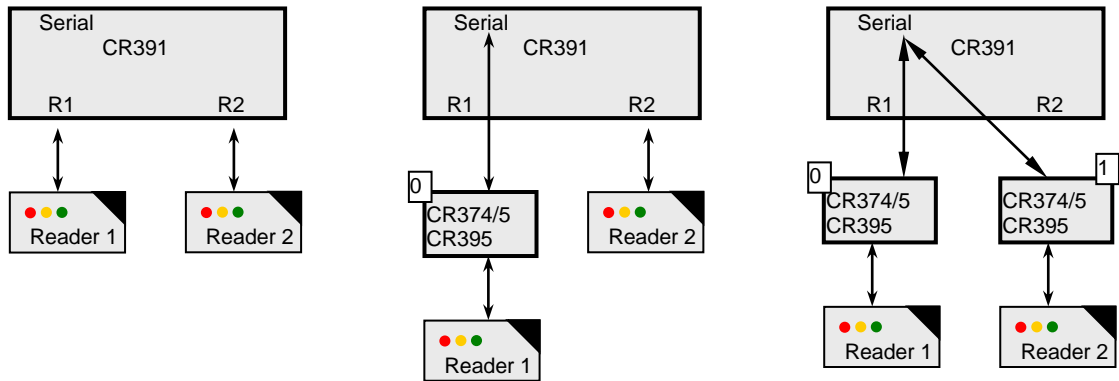
5.2.12 Acceptance test procedure

During production, CRC is subjected to a variety of tests and checks. A built in test (BITE) is used to test all HW functions of PCB and once installed in housing, functional tests are performed.

5.3 CONFIGURATION

The CntrP is installed in as stand-alone unit or as part of a system and is configured to control one door (with a reader in and reader out) or as a multi door controller (reader in, free or egress exit).

Readers are connected directly to the PCB (Wiegand, Data/Clock, 1-wire Touch, serial RS232 or RS485) or via or CR374/5 or CR395 front end modules connected to a RS485 port.



0 Interface number

* **Legacy mode** - Interface with address link.

Universal mode - up to 8 readers can be addressed to any port (each reader requires Com, Node, Port settings).

5.4 FUNCTIONALITY

All functionality available in Softcon products are described in the library manual (SCS_CR39x.Library.manual.PDF). This manual contains a table of functions, indicating which controllers are enabled for each function.

5.5 DATABASE

The CntrP uses a local battery backed up database of card holders (up to 125,000) which indicates if the card is enabled for each reader, the time group allocated to the card, if the card is a pass back card and a capture card.

In Universal mode, cards can have additional properties (e.g. supervisor, report, etc. – see library manual).

When the dB type is changed, all data is lost.

In LAN systems, the PC updates the database and the local data is overwritten. No upload to the PC function is available. A batch load function is available for the hand programmer.

See library for more detail.

6 PC COMMUNICATION

6.1 TCP NETWORK

When installed to the PC via a TCP connection, comms is 10M or 100M, half duplex.
See library manual for details.

When connected directly to a PC, a crossover cable must be used. A straight cable (1 to 1) is used when connected via multiplexers/routers. See connections for pin outs. The two red LEDs on the uP PCB indicate the status of the TCP comms, with off indicating that comms is established.

6.2 LAN MASTER

When installed as a master to LAN system, the required serial port (generally serial B) of the CntrP must be set to serial – master. The serial port must be linked to RS485 and pull-up and down resistor must be linked on data, /data (see links in the lid insert). The number of slaves is set in the EERAM (sent from the PC). If the CntrP also functions as a controller (slave), the Node must be set to the appropriate node address (see hand programmer below).

See library manual for setting and status check.

6.3 LAN SLAVE

When installed as a slave to LAN system, the required serial port (generally serial B) of the CntrP must be set to serial – slave. The serial port must be linked to RS485.
See library for the required set-up.

The running of the LAN cable must be such so as to avoid electrical interference.
Each segment of the LAN must be earthed only at the controller furthest from the PC.

The ground of the CntrP are tied together to bring the potential to the same level. This is to prevent the transzorb protection devices on the controllers (between signal and ground) from “firing” due to potential differences.

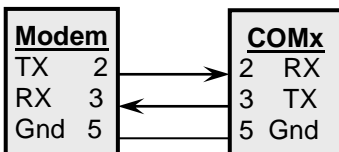
LAN cable stubs must be avoided, i.e. no T-joints must be made and the cable should be looped through each controller, i.e. only two ends to the cable. The two furthestmost ends of the cable must be terminated with the characteristic impedance of the cable, generally 120 ohm resistors between data and data not. Note that any unit can physically reside anywhere on the LAN, the PC mux does not need to be installed in the centre of the LAN or at the end.

For test purposes, a slave CntrP can be set to act as multiple controllers with a range of addresses – see library.

6.4 MODEMS

Via the HH, the comms mode is set to type modem. Baud and the bits type are set.

The controller ignores HW handshake (CTS / RTS) and does not generate Data Terminal Ready (DTR). Modem setting thus requires that DTR be ignored. Certain modems do not have such a setting, or does not function correctly. Such modems must be wired as a null modem as indicated below, else a connect command is not received.

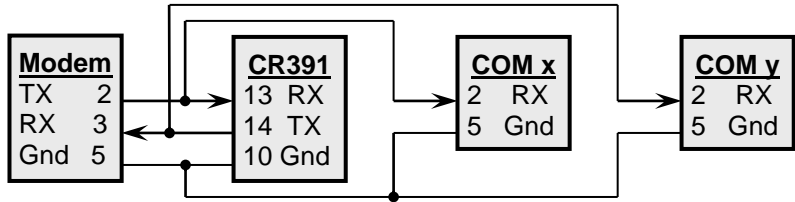


CONTROLLER TERMINAL	MODEM PIN (9 WAY F)	MODEM PIN (25 WAY F)	NAME	MODEM DESCRIPTION
14 TX	3	2	RD	In: Receive data
13 RX	2	3	TD	Out: Transmit data
	7	4	RTS	In: Request to send
	8	5	CTS	Out: Clear to send
	6	6	DSR	Out: Data ready state
10 GND	5	7	SG	Signal ground
	1	8	DCD	Out: Data carrier detect
	4	20	DTR	In: Data terminal ready
	9	22	RI	Out: Ring indicator

For a null modem: Interconnect DTR, DCD and DSR.
Interconnect RTS and CTS.

See library manual for functionality detail.

To monitor communication between controller and modem, connect as follows to the PC:



6.5 GSM MODEMS – CALLER ID READERS

A GSM modem can be connected to a serial RS232 port B configured as serial type 11. The serial port baud, number of bits and parity must be set to match that of the modem.

The caller ID is used as an access card - See library manual for details.

6.6 SERIAL COM PORT / INTERFACE

The CntrP has 5 serial ports:

ComA 1 ComB 2 ComC 3 ComD 4 ComE 5

These are linked via 0 Ohm resistors or links to serial interfaces as below.

HH, LAN and RS485 interfaces require RS485 components and RS232 required appropriate RS232 components.

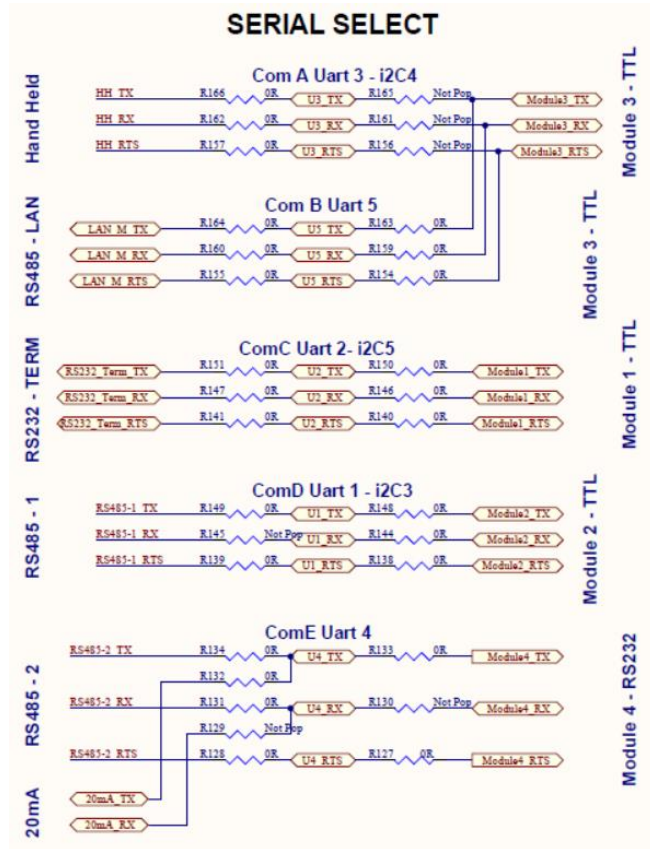
Com port requires resistors / link to one set of TX, RX and RTS.

6.6.1 CR391

Resistor numbers may vary for PCB versions.

The physical positions are the same.

HH	P19
LAN-M	P2
RS232-Term	P2
RS485-1	P10
RS485-2	P17
Module 1-TTL	P15
Module 2-TTL	P16
Module 3-TTL	P12
Module 4-RS232	P9
20mA	P7



6.6.2 CR391U

Three identical link fields select TX, RX and RTS, where:

a, b, c, d and e indicate ComA, B, C, D and E,

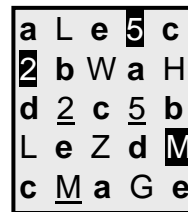
5 = RS485-1	P3
<u>5</u> = RS485-2	P4
2 = RS232-1	P7
<u>2</u> = RS232-2	P7
L = LAN	P7
<u>M</u> = Module-2	P9
M = Module-1	P10
W = WiFi	P11 or onboard
H = Hand Held	P14
G = GSM	Onboard
Z = Zigbee	Onboard

Links are between any adjacent two pins.

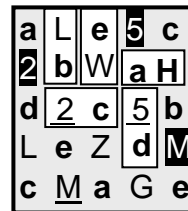
Default is:

ComA	Hand Held
ComB	LAN
ComC	RS232-1
ComD	RS485-1
ComE	WiFi

TX/RX/RTS



TX/RX/RTS



7 PERIPHERALS

A variety of readers, displays, door monitors and input devices can be tied to the CntrP. These are listed below:

7.1 CARD READER

Two Wiegand / Data/Clock / Touch card readers can be connected directly to the CntrP.

Card readers should always be mounted within 50 meters of the controller utilizing an 8 core 0.2mm² mylar screened cable. Serial readers generally use a 2-pair screened cable. The screen must always be connected to mains earth terminal block in the controller. Always ensure that all metal-based equipment that the reader is mounted on (gooseneck, turnstile etc.) is well earthed to mains earth. Ideally the reader should be mounted ± 1.2m above ground level. When using swipe readers ensure sufficient space to accommodate the swipe action from insert through to follow through is provided for. Special care must be taken when mounting proximity or hand-free readers. Problems are encountered with readers influencing one another. When mounting Prox reader on metal, the read distance decreases (typically by half). Mounting the readers on non-metal spacers e.g. wooden or plastic base plates of 1cm or more, resolves this problem. Detailed mounting instructions are available from the manufacturers of the readers.

Reader connections are by means of plug in 7 or 10 pin screw terminals

Ample cable slack should be left at both sides of the cable, facilitating the removal of the reader from its mounting

position while it remains connected, and allowing the two reader connections to be exchanged at the CntrP end. Excess slack should not be coiled up inside the housing.

Use the appropriate CntrP housing knockout / SlideTie for the cable entry - see installation.

Before switching on the controller, make sure of the power requirements of the readers installed. Older versions of the CR391 can set the reader voltage to 5 or 12VDC via setup (with current limit). New versions of CR391 and CR391U have links allowing for 12V or 12V via current limiting resistor. Current limit prevents blowing the on-board 12V fuse if reader supply is short-circuit.

Note that newer versions of CR391 and that CR391U do not have 5V supply options for readers.

5V readers require 12 to 5V adapters (Softcon MO340).

MO340 can contain LEDs. Polarity of Clock can be inverted.

MO340

CntrP	Function
P1-1	GND
P1-2	Lo/Data in
P1-3	Hi/Clock in
P1-4	12V in
P1-5	Green LED out
P1-6	Yellow LED out
P1-7	Red LED out

Reader	Function
P2-1	GND
P2-2	Lo/Data out
P2-3	Hi/Clock out
P2-4	5V out

To invert Clock
Remove R2
Add R1 and Q1

Reader pinouts are generally shown on the back of the reader.

CntrP pinouts are (colors shown are generally used in Softcon manufactured readers):

CntrP READER CONNECTION

CntrP Pin	Cable	Function	Description
1	Red	+VCC	5V/12V/12VR
2	Yellow	Low Data	"0" (data, touch)
3	Green	High Data	"1" (clock)
4	Black	Ground	
5	Brown	Pass LED	Green
6	Blue	Ready LED	Yellow
7	Purple	Fail LED	Red

Serial readers can be connected to serial ports (ASCII numbers ending in CR) or added via FrontLan (CR374 / CR375 / CR395). In Legacy mode, these are reader 1 or 2.

In Universal mode, up to 8 readers can be connected via serial RS232 or RS485 (direct or LAN). See library reader addressing.

It is good practice to use an unused core as an additional ground, i.e. double up on the ground line with two cores, especially on long cable runs.

Reader names, activities and the date-time can be displayed on LCDs. See LCDs.

7.2 PIN-PADS

In Legacy mode, one or two PIN-pad readers (Universal mode up to 8) can be tied to the CntrP and function independently or in conjunction with the card readers.

In Legacy mode Softcon CR374/CR375/CR395(s) are connected to reader 1 serial port (RS485 mode). Universal mode uses reader addressing. See library manual for functionality detail.

7.3 LCD

In Legacy mode, one or two LCD displays (Universal mode up to 8) can be tied to the CntrP and function in conjunction with the card readers.

In Legacy mode Softcon CR374/CR375/CR395(s) are connected to reader 1 serial port (RS485 mode). Universal mode uses reader addressing. See library manual for functionality detail.

7.4 ACTION COMPLETE

One or two action complete detectors (Legacy mode) or up to 8 (Universal mode) can be tied to the CntrP. See library manual for functionality detail.

7.5 EGRESS (PUSH BUTTON)



One or two push buttons (Legacy mode) or up to 8 (Universal mode) can be tied to the CntrP, which request the opening of the latch.

See library manual for functionality detail.

7.6 LATCH

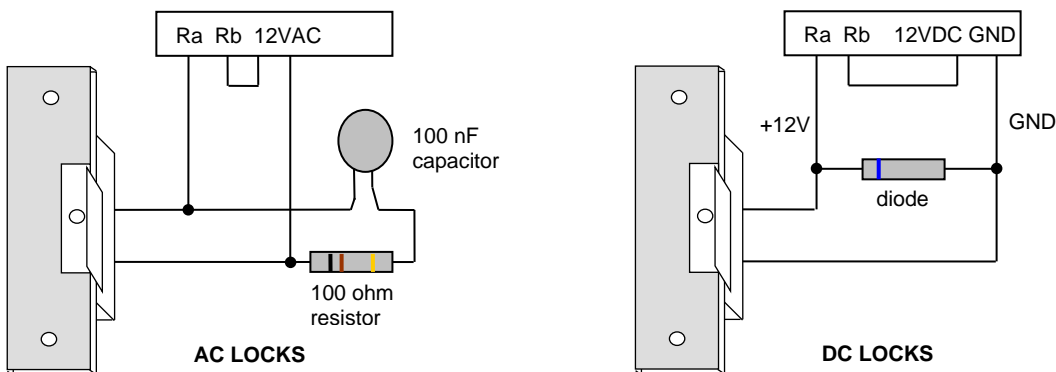
One or two control points (Legacy mode), or up to 8 (Universal mode) can be tied to the CntrP. See library manual for functionality detail.

The CntrP has 4 potential free relays (2 have normally closed and 2 have normally open contacts). Normally open or normally closed can be changed in setup. Relays can switch AC or DC.

[CR391 have 12VAC pins (requires the PCB supply is 12VAC).]

The resistor/capacitor for AC and diodes for DC components reduce the “flash-over” of the relay contacts. The fly-back components should be installed at the load, i.e. at the lock or roller door/boom logic board. Fly-back relays must also be installed on inter-posing or other inductive loads being switched.

When switching DC loads, the ideal is to run the negative line (ground) to the load and switch the positive line (+12v) through the relay. Below Ra and Rb indicate the relay contacts



[In older CR391 versions of CR391, unregulated 12VAC and 12VDC are available for feeding through the latch relays (see power supplies below). Latch supplies are derived from a separate winding of the 12V transformer installed within the CR391 housing (the other winding generates the supply for the PCB)]. The 12 VAC is rectified and smoothed for the 12 VDC supply. AC supply to the primary winding of the transformer is set at 110 or 220V.]

{CR391U is supplied 12VDC}

Total current drawn by the latches should ideally not exceed 1A.
Fuse on the CntrP has a 2A fuse installed for 12VDC {CR391U all supplies}.

[CR391 has an additional fuse for supply to user (AC and DC)].

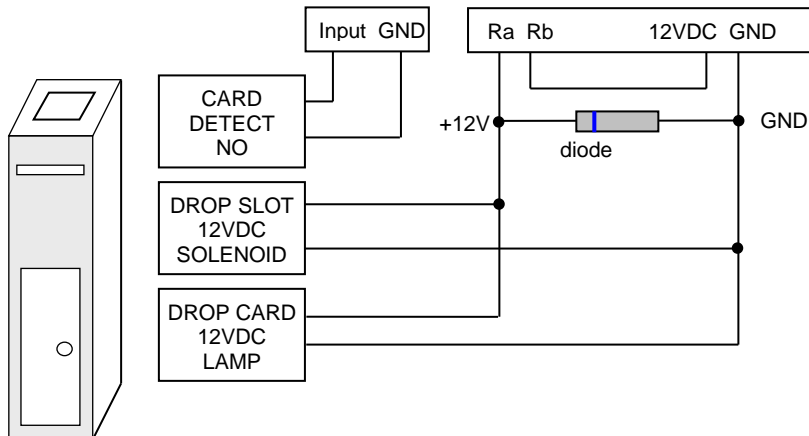
7.7 BOOTH / MANTRAP / INTERLOCK

Booth is **Softcon**'s term for "air-lock", "inter-lock" or mantrap, i.e. if a pair of doors is set for booth then they are inter-locked, only one may be opened at any time.
See library manual for functionality detail.

7.8 CARD CAPTURE BIN

A card capture unit is an enclosure in to which visitors must insert their cards before exit is permitted from the premises. See library manual for functionality detail.

The card capture bin is installed at the reader, with the card insert point into the bin in close proximity to the reader. The drop card sensor is a potential free normally open contact (micro switch or optical), grounding the input when the card is sensed.



The connections are as given above. Flash back diodes (1N4002 or better) must be installed at the relay contacts and coils in the card capture unit (see “Latch connections” above). The output can be moved to any of the outputs (typically output 4 is used as shown) – see output type. The Output can be changed NO/NC via the set-up menu.

7.9 TERMINAL / TEST

A VT100 compatible terminal, with serial RS232 communications (such as Windows Hyper Terminal), can be tied to the CRC in the test mode and in BITE mode. See Library for settings and functions.

If powered up with the reset link in (see reset above), the first reset defaults serial B to test.

Generally, the baud rate of the terminal is required as 19200, 8 data bits, 1 stop and no parity. HW handshaking is not required, but X-on/off is used. The rate is set via hand programmer or PC (Universal mode).

RS 232 connections for the terminal are:

Function	Cable Colour	Terminal D25	Terminal D9
Ground	Green	7	5
RX data	Blue	2	2
TX data	Red	3	3
Screen	Screen	None	None

For test purposes, a slave CntrP can be set to act as multiple controllers with a range of addresses – see Node/Event simulate in library documents.

8 TRANSPORT AND STORAGE

Limited protection is provided against mechanical damage, but the CRC is transportable if not manhandled. Protection against electrical damage, as well as against effects of static electricity is sufficient.

9 UNPACKING

All controllers are generally delivered mounted within steel enclosures and are wrapped in plastic. The terminals, PCs and printer are delivered in polystyrene protection.

The serial number of the units and the version of software provided (where applicable) is written on to the plastic wrapping. A small plastic packet containing diodes, resistors, capacitors, molex plugs and pins are supplied inside the CR enclosure. The keys to the CR enclosure lock are strapped onto the locking lever within the CRC enclosure.

10 INITIAL INSPECTION

A visual inspection of all units is done before and after unpacking. Defects must be reported immediately, and no defective units should be installed.

11 ASSEMBLY

All *Softcon* manufactured units are workshop assembled, fully tested.

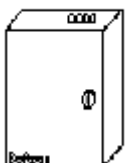
12 INSTALLATION

GOLDEN RULES TO SUCCESSFUL INSTALLATIONS ARE:

- READ THE MANUAL
- AVOID ELECTRICALLY “NOISY” ENVIRONMENTS.
- KEEP CABLE LENGTHS AS SHORT AS POSSIBLE.
- USE SCREENED CABLES.
- EARTH CONTROLLERS, CABLES SCREENS and METAL ON TO WHICH READERS ARE MOUNTED.
- USE “CLEAN” AND STABLE MAINS SUPPLY.
- SUPPRESS “FLY-BACK” AT INDUCTIVE LOADS.
- SWITCH THE SUPPLY TO LOADS (not the ground return).
- USE COMMON SENSE.

The installation of the controller and peripherals are described for each item below.

13 MOUNTING



The CntrP metal enclosure has four 5mm holes and moulded housing has four eyelids in the back plate of the enclosure for easy mounting. Moulded housing contains a pamphlet indicating hole location.

Ideally the CntrP is mounted at a height of 1.5m to the bottom of the housing and central to the card readers connected to it. When selecting the physical position to mount the controller, take care to avoid mounting the controller within close proximity to equipment generating electromagnetic fields (EMF).

Typical EMF or noise generators are: radio transmitters, lift shafts, electric motor, electric solenoids, transformers, distribution boxes etc.

Mount the CntrP so that the diagnostic light emitting diodes, (LED's) are easily visible.

Utilise the 20mm knockouts on the metal housing {or Slide-Tie on the moulded PVC housing} on the side of the enclosure for cable entries. Power to the controller is normally via 110 / 220 VAC supply. This supply should be connected onto the 3 way terminal plug or block. If a battery back up unit is being used refer to the Battery Backup.

An optional housing is the CntrP PCB, PSU mounted on a metal plate of 18 x 27 cm. Three 5 mm mounting holes are provided on the plate.

Mounting of each item is described below.

14 CABLING

Cables should not be run in close proximity to other cables or across equipment generating noise.

Where cables have to run close to or along noise generators, it is imperative to physically separate the cables from the noisy equipment and cables. A 10cm separation reduces the noise factor tremendously.

Maximum cable lengths and cable types are listed below.

Reader, LCD/keypad and PIN-pad cables must be screened cables, with the screen being tied to earth at the CntrP. The LAN cable must be screened and tied to earth at one side of the segment only, i.e. the screen must not be looped though,

Cables must not lie over the PCB, this prevents noise from being induced in to the electronic circuitry.

Routing cables through the housing knockout / Slide-Tie that is closest to the appropriate connector on the PCB ensures minimum cables within the housing.

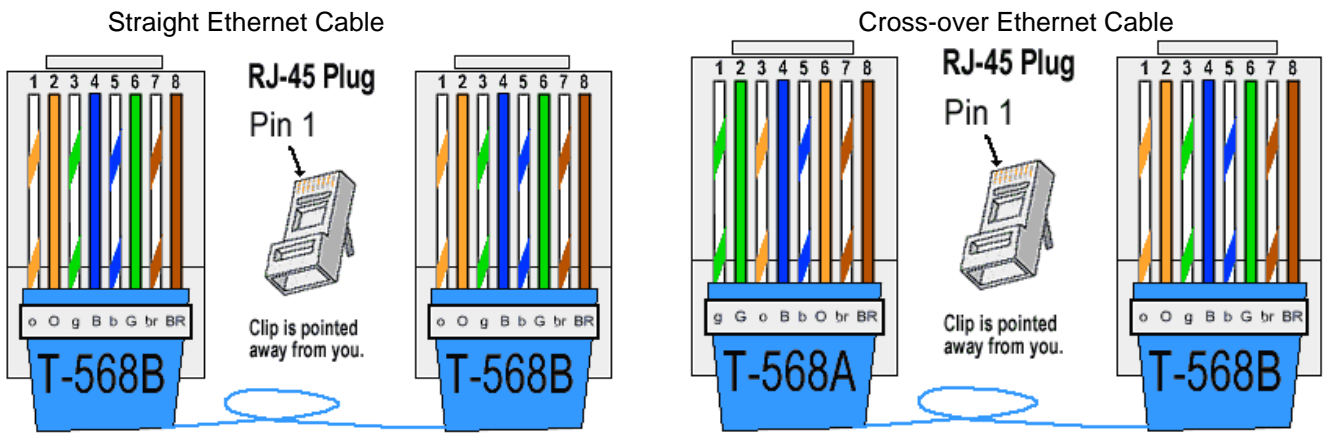
Using the suggested cable colors simplifies maintenance.

Location	Cable	Max m
Card reader to CntrP	8 Core, m/s 0,2mm mylar screened	50
CR372/4/CR395 to CntrP	2 Pr twisted m/s 0,2mm mylar screen	2000
CntrP to terminal	3 Core, m/s 0,2mm mylar screened	10
CntrP to LAN controller	2 Pr twisted m/s 0,2mm mylar screen	2000
CntrP to PC MUX	2 Pr twisted m/s 0,2mm mylar screen	2000
CntrP to latch	2 Core, m/s	50
CntrP to action complete	2 Core, m/s	50
CntrP to egress	2 Core, m/s	50
CntrP to card capture	4 Core, m/s	50

The maximum lengths tabled above could be exceeded in certain instances, and depends on cable resistance, electrical noise, etc., this can only be ascertained when installed.

15 CONNECTIONS

See SCS_391.booklet.pdf and SCS_CR391.lid.pdf in the appendix.



Ethernet Pin Out

Pin	Type
1	TX+
2	TX-
3	RX+
4	
5	
6	RX-
7	
8	

16 JUMPERS AND DIP SWITCHES

See lid pamphlets in the appendix.

17 STARTING UP

The power is simply switched on.

18 PRE-START CHECKS

Before starting up, all wiring must be checked. Note that faulty wiring could permanently damage the equipment. Ensure that the power-supply selection to the readers (12V or 12VR) is set according to the readers used.

In LAN installations, all node addresses on the CntrPs must be pre-set to the appropriate address.

No two units on LAN may have the same address. CntrP addresses start at 01 for the LAN master and run consecutively. The baud rate on all the CntrP on a LAN must be the same (9600 or 19200).

The front module setting (via hand programmer or via PC in Universal mode) must be set to match the installation.

Should a front module be set and the module is not present, the speed of the reader function slows down.

The connection information provided within the lids of the controllers indicates the node address and terminal information.

The battery link must be installed.

The mode the CntrP function must be set with the hand programmer in stand-alone applications – updated from the PC.

19 PROGRAMMING

All set-ups are kept in the CntrP battery backed-up or Electrically Erasable memory. Set-up is by using the hand programmer or by sending set-up information from the PC.

19.1 HAND PROGRAMMER

A Softcon CR374 / CR375 / CR395 with LCD/keypad can be connected to the CntrP as a programmer (HH link in), facilitating the setting or altering of configuration parameters and card codes/statuses.

LCD/keypads can also be used to request and indicate certain information.

PC programming overwrites HH settings.

19.2 PC PROGRAMMING

Programming via TCP or LAN overwrites the set-up in the CntrP.

Softcon SCS_CLIENT or SCS_DEVICE (universal mode) can change settings in the CntrP.

SCS_DEVICE (universal mode) can read the settings in the CntrP.

See the appropriate PC SW manual or the LAN master controller.

20 UPDATING

The controller FW can be updated with PC based programmers or via boot-load Ethernet (UDP) or RS485 LAN connections. Updating via the LAN requires a CR391 master LAN controller installed with the boot-loader application. This application is transparent to the other functions and applications.

The manual SCS_CR391.FWupdate.manual for details.

21 CLOSING DOWN

Should it be required to switch off a CntrP, the power switch (if installed) within the unit is simply turned off, or the power cable is pulled out of the socket.

Note that when CntrP is powered-down, the outputs are not active, resulting in non-control (e.g. doors may be locked or unlocked permanently, depending on the lock type used. The latch relay contact is open when the CntrP is powered off.

22 MAINTENANCE

22.1 USER

Error detection is limited to the observation that the controller is not functioning “normally”, i.e. one of the following is not correct:

22.1.1 Functional indicators

[CR391 has four LEDs (green, red and two yellow) are mounted on the edge of the PCB and are visible outside the housing. Three surface mount LEDs on the PCB indicate additional information].

{CR391U has up to 10 LEDs on the PCB – displays on the lid of the moulded housing.}

The “RUNNING” green LED on the controller housings flashes approximately every second, indicates that the unit is functional. An off or steady-on LED indicates an error.

The “COMMS” red LED on the enclosure indicates the status of the serial communications.

In LAN installations, a steady-on LED indicates that comms is correct, while a flashing or off LED indicates that COMMS is intermittent or “DOWN”. In the terminal mode, the LED flashes every second, when the time on display is updated. The LED flashes whenever data is received or transmitted (from / to the terminal).

The “ENTRY odd” yellow LEDs flash whenever valid data is received from reader 1, 3, 5, 7.
The “ENTRY even” [yellow] {green} LEDs flash whenever valid data is received from reader 2, 4, 6, 8.
The “ENTRY” LED remains on for a misread or wrong card type and goes off when a correct card is read.
Additional LEDs show:

TEST	Test options can be selected.
RX	Selected Com Port RX (data received).
TX	Selected Com Port TX (data transmitted).
{GSM	GSM connection status.}
{WiFi	WiFi connection status.}
{Zigbee	Zigbee connection status.}

Test option generally shows RTC read. More options to be added.

One Com Port can be selected (via HH) for RX/TX LED status. When data is received from / transmitted to the Com Port, the LEDs is flashed. If no selection the done, FrontP comms is shown, if no FrontP is set, LAN (master or slave is shown).

22.1.2 Card reader

The two on-board reader LEDs are:

YELLOW:	“Ready” when the door is closed.
RED:	Access denied.
GREEN:	Access granted.

Misreads, wrong card type or facility error (card not belonging to the site) results in the red and yellow LEDs being on.

Entry of a code (swiping of a card, selection of a PIN-pad key) results in an indication of the entry reader LED on the CntrP housing. A legal code entered at the reader results in the door latch being opened.

Multiple illegal code entry attempts results in the reader being disabled (all LED’s of the reader off). The number of attempts and the period, for which the reader is disabled, is pre-configured. The disabled reader is re-enabled when the door is opened legally, i.e. via egress button control, when a legal code is entered via another reader.

When the reader is disabled on input or by the PC, the RED LED is on. The green LED is on while the door is open.

22.1.3 Door control

Door control errors are detected by the user if any of the following do not occur:

- On entry of a legal code, the door latch is opened until the door is opened, or until a pre-set time-out has expired (door not opened). See action complete.
- Doors opened too long (pre-set time-out) or doors opened illegally (i.e. not opened by the CntrP after a legal code is entered or a push button is selected), result in the error buzzer being sounded (if set).
- Selection of a push button results in the door latch being opened.

REPAIR

Repair actions taken by the operator are limited to ensuring that the power to the CntrP is switched on, and the door is closed. The re-enabling of a reader disabled after multiple illegal codes were entered is by opening the door legally (via other reader or via push button).

22.2 INSTALLER

If reader connected directly to the CntrP errors occur, swap the readers by swapping the connectors on the PCB (identical). The power need not be switched off (ensure that both readers require the same voltage supply). If the error stays with the reader, replace the PCB, else replace the faulty reader after checking the cabling.

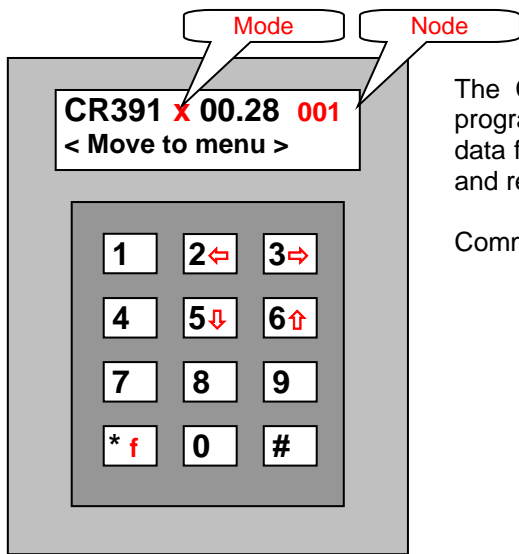
22.3 WORKSHOP

The mean time to repair is 20 minutes or less and is aided with a BITE option.
A PCB repair schedule is listed as an appendix.

A debug / test mode can be set via the hand programmer, with data displayed on a serial RS232 terminal connected. See terminal / test mode above.

APPENDIXES

23 CR374/5 CR395 HAND HELD TERMINAL



The CR374, CR375, CR395 hand held terminal provides the means to program the CntrP and also provides display (date time, access status and data from the PC, typically card holders name), keypad (used for PIN codes) and reader for access control. See the document SCS_HH.booklet.doc.

Communication is RS485.

24 FW REVISION HISTORY

FW version is CCC.LLL, where ccc is version changes specific to the CntrP and LLL is library changes. See the library manual for LLL revisions.

The CCC revisions are:

000	2012-01-01		Proto-type.
001	2014-10-01	Alter	New common library update
002	2014-12-02	Alter	Memory map (set-up data changing)
003	2014-12-05	Alter	uP memory MAP kernal to 2k boundary (parameters were being changed)
004	2015-01-08	Correct	uP memory MAP error in 003
005	2015-01-15	Correct	Batt RAM error
006	2015-01-26	Correct	PMA address - error in SerC
007	2015-02-12	Correct	PCB version 1.5
		Alter	Default dB size to 64/32,000
008	2015-02-25	Add	I/O vend
		Alter	Vend after set-up, default reader enabled
009	2015-04-20	Correct	Serial boot-loader
00A	2015-05-04	Alter	New boot-loader (double MAC problem)
00B	2015-06-08	Alter	Speed up card read (no A2D or Reset-link while card)
00C	2015-08-05	Alter	Increase SRAM start wait state (memory bad reads)
00D	2015-08-20	Alter	Tick interrupt to library
		Add	GSM modem
		Correct	Extra RAM wait-state, corrects dB errors
00E	2015-08-28	Correct	Output 5,6 was mapped to 3,4. Now 5,6 to extender plug - buzzer on 5,6 caused error on capture 3,4
00F	2015-09-07	Alter	Initialize readers last (RD supply on PCB<2.2 intermittent)
00G	2015-09-15	Alter	130,000 cards
00H	2015-10-13	Alter	Output expander RCK now pin 9 (was 10)
00I	2015-11-15	Alter	Delay on power-up for POWER_PRESENT on PCB<2.0
00J	2016-03-03	Alter	Disable Reset pins
00K	2016-06-06	Alter	Re-enable Reset pins
00L	2016-07-11	Alter	Bootloader 1.12 (correct LAN update, events from other CRC while update)
		Alter	I/O mapping to match LIB V01Z
00O	2017-03-14	Alter	Bootloader 1.14 (flash fast if node 128) Flash run LED fast if node 128
00P	2017-06-22	Correct	A2D extenders 3, 4
00Q	2018-01-29	Alter	Bite display timing
00R	2018-05-29	Add	Version PCB x
00S	2018-05-30	Correct	RX, R0 LED V2 / Vx
00T	2018-06-20	Add	Cash loader
		Correct	Bootloader 1.14 (00Q back to 1.13)
00U	2018-08-26	Alter	Legacy project
00V	2018-09-10	Alter	TCP setting add port to BLM, gateway to BLM
00W	2019-04-15	Correct	Power-up delay to 2 sec - old PCBs need wait for 5V
00X	2019-05-25	Alter	ID non-ETHERNET to match Universal
00Y	2019-07-30	Alter	Bite does I/O Xpanders
00Z	2020-03-01	Alter	Reader interrupts
010	2020-11-26		Sync version number
011	2021-09-03	Correct	Reader interrupt (ZK)
012	2022-01-25	Alter	PIC RAM 64k, now also do PIC32MX775 and PIC32MX675

010	2017-08-06	Alter	Universal
011	2018-08-06	Add	If reset link in on power-up, scroll LEDs, flash tamper status
012	2018-09-10	Alter	Gateway and port to BLM
013	2018-11-15	Alter	bI2C_CR391X to eBLM.APP_BITS.bBL_APPbits.I2C_CR391X
014	2019-01-15	Correct	EERAM MAC (when no TCP)
015	2019-04-08	Correct	Power-up delay to 2 sec - old PCBs need wait for 5V
016	2019-04-26	Correct	Keys overwritten - on link reset (if event stats compiled)
020	2019-09-26	Alter	Compile 8 readers

012	2020-03-01	Alter	Reader interrupts
101	2021-09-03	Alter	Reader interrupts
102	2022-01-25	Alter	PIC RAM 64k, now also do PIC32MX775 and PIC32MX675

25 PCB REVISION HISTORY

B710	2010-06-01		CR 391 Prototype 1
B711	2010-09-01		CR 391 Prototype 2
B712	2011-04-20		CR 391 Prototype 3
B713	2011-09-15		Release 1
801.3	2013-10-15		Release 2
801.4	2014-05-10		Release 3 – Corrected GND to earth. Has input 16 to GND error (corrected by removing via).
802.2	2015-07-21		CE certified
803.3	2018-10-01		CR391U, CE certified
803.13	2021-11-01		CR391U, PF sized uP (normally PT) – same pinout, wider body

26 REPAIR GUIDE

To be added.

27 TROUBLESHOOTING

In the list below, correct each step before proceeding to the next.

27.1 NO POWER

Check that the controller is switched on.

Check the Mains power.

Between Live and Neutral	110 to 240 VAC (220 VAC for older versions with transformer).
Between Live and Earth	110 to 240 VAC (220 VAC with transformer). If not, faulty earth supply.
Between Neutral and Earth	0 VAC.

For versions with transformer:

Check the Mains power on the primary winding of the Transformer (220 VAC).

Check the power on the secondary winding of the transformer (12 VAC and 9 VAC) and on the input power on the integrated uninterrupted supply. If not, faulty transformer.

For versions with PSU:

Check the Mains power on the AC input. If no 110 to 240 VAC, wiring error.

Check the fuse for the integrated uninterrupted power supply as well as the fuses on the controller.

Replace fuse with correct rating. (2 amp).

Check the power on the power connector.

Note that earth must remain connected via the mains connector or be connected to the earth terminal block provided in the housing.

27.2 CONTROLLER DOES NOT COME ON-LINE

Connection to RS485

With HH programmer, check controller serial port (generally ComB) settings:

Serial type LAN master or LAN slave.

Baud rate 9k6 or 19k2, 9 bit.

ALL CntrP MUST HAVE THE SAME BAUD RATE.

LAN Comms type to top (if LAN slave).

Node address settings. Node 1 for master.

NO NODE DUPLICATED.

Check the RS485 cable (2-pair twisted with screen) and connections – see lid insert.

No cable T. Each cable segment, screen earthed at one end (no loop though).

Test for a short circuit between earth and ground.

When installing as a slave to LAN (RS485) there must not be a short circuit between earth and ground.

Check for the end of line resistors.

A 120 ohm resistor must be installed between D0 and D1 on both ends of the cable.

Check cable for continuity resistance with the end of line resistors connected and all controllers are removed from the LAN. The continuity resistance must test between 60 ohm and 90 ohm.

Checked link for the D/D pull up/down resistors. See lid insert for the link number.

Links must be installed when the CR391 is the master, removed for slaves.

Connection to TCP

With HH programmer, check the CntrP setup:

Master PC-LAN.

TCP/IP Comms to top.

Net IP address and Sub Net Mask address.

As CntrP is server, no Net Gateway is required in the CntrP.

PORT setting in the range 50000 to 65000 (default is 56789).

On the PC, check the setup in the SoftWin software.

Comms interface setup to TCP/IP.

IP address (no leading zeros).

Check the Ethernet cable connections.

Cross over cable is used when the controller is installed directly to the PC.

Strait cable is used when the controller is installed on a network switcher.

Check that you can ping interface from the PC:

Run Cmd. E.g. "PING 192.1.4.155 -t". -t can be omitted, if added the ping command is repeated.

Check that the Anti-Virus software does not block the PORT number.

Check that the Network Switchers does not block the PORT number.

27.3 READERS DO NOT READ CARDS

Check that the readers are mounted according to the manufacturers mounting instructions.

Check that the cabling is properly crimped and installed at the controller.

Check that the wiring is installed correctly according to the manufacturers specifications and that the wiring matches the controller connections. See reader connections in the installation manual.

Check that the reader cable is earthed correctly.

Check power links power required for readers (5V, 12V, 12VR).

Readers requiring other voltages, must be powered from an external power supply.

With HH programmer, check the following setting:

For Universal mode, check reader addressing (ComNodePort).

Reader bit type. Card types are tabled in the Library Manual.

Clock polarity.

Data Base type to match card type (random number must be type 10).

Check that the card is enabled for both readers and that the time group is active

For random database, the card number must be entered.

With the HH programmer, correct card number is displayed when the card is badge at reader x.

Select "Card enter at Reader x" on the HH to display the card number.

Display card HEX shows the number of bits read and the RAW HEX data.

In the event that one of the readers is not displaying the card number, swap the reader cables around on the connector and re-test. In the event that the fault appears on the same reader port, the reader port is faulty.

In the event that the fault moves with the reader, the reader or the cable is faulty.

27.4 OUTPUT RELAYS DO NOT LATCH

With the HH programmer, check output port setup:

For Universal mode, output addressing (ComNodePort).

Output type (Latch) and for Universal mode XREF (door number 1 to 8).

Output polarity (NO, NC or invert).

Latch time (for Universal mode – the resolution, e.g. second, and the tmout, e.g. 5).

Latch type (pulse, till closed, till tmout).

Check that the wiring to the output is wired correctly.

To eliminate external errors, disconnect the connector and measure between the relay pins or use the Softcon test module.

Check that the feedback diode is installed.

Check voltage on the user power supply or external power supply.

27.5 INPUTS DO NOT TRIGGER

With the HH programmer, check input port setup:

For Universal mode, input addressing (ComNodePort).

Input type (e.g. egress).

Universal mode XREF (e.g. door number 1 to 8).

Check that the wiring to the input is wired correctly.

Measure between the input pin and GND.

To eliminate external errors, disconnect the connector and test the input with a connection to GND (pin 1 or 6) or use the Softcon test input module.

27.6 CAPTURE BIN NOT CAPTURING CARDS

Check that the wiring is wired correctly. See wiring diagram in the installation manual.

Check that the Card is setup as a Capture Card.

Check the setup:

Reader is set as capture reader.

Input (card drop) is selected as type CAPTURE x, Universal mode XREF (e.g. reader number 1 to 8).

Input polarity and debounce.

Output is selected as type CAPTURE x, Universal mode XREF (e.g. reader number 1 to 8).

Output polarity and tmout.

Check the DC voltage on the solenoid that opens the door for the capture card.

Voltage generally is 12VDC.

Check the Flash back diode is installed the correct way around.

At the PC, in SoftWin, check that the capture group is setup correctly.

28 ABBREVIATIONS AND TERMS

AC	Action complete (door status monitor).
Ah	Amp hour.
AMP	Measurement of electrical current.
APB	Anti-pass back (card cannot re-enter an area without exit).
ASCII	Data that can be displayed as text.
ATB	Anti-time back (card cannot be used at a the same reader for a set time-out).
Barrier	Vehicle boom.
Baud	Rate of bits per second of serial data on a communication line.
Bit	One bit of data, a logical zero or one.
Booth	A two door cubicle (mantrap), allowing access of only one person.
Byte	A character of data (8 bits).
CR351	Softcon 2 reader controller (Data/clock).
CR354	Softcon 2 reader controller (Wiegand).
CntrP	Softcon control panel CR351 or CR391U.
Darlington	Type of integrated circuit (electronic component) for driving outputs.
DC	Direct current.
DB	Data base of card information.
DIP	Dual-in-line plug switches (on the PCB for address selection).
EC	European commission (standards for electrical emission and susceptibility, etc).
EPROM	Erasable Programmable Read Only Memory (component containing the program).
FW	Firmware (PCB program, in EPROM).
IC	Integrated circuit (electronic component).
LAN	Local Area Network (communication network linking a CRCs to the PC).
LED	Light emitting diode.
LSB	Least significant bit of a byte.
MAG	Magnetic stripe reader / card.
Mantrap	A two door cubicle (booth), allowing access of only one person.
MSB	Least significant bit of a byte.
NC	Normally closed.
NO	Normally open.
Node	LAN unit.
On-line	Connected to a PC.
Open collector	Type of integrated circuit (electronic component) for driving outputs.
PAL	Programmable Array Logic (an electronic component).
PC	Personal Computer (IBM compatible).
PCB	Printed Circuit Board.
PIN	Personal Identification Number.
RAM	Random Access Memory (parameters and card set-up).
ROM	Read Only Memory (FW).
SW	Software - PC program.
TTL	Transistor, Transistor Logic (digital IC).
UL	Underwriters Lab (standards for electrical emission and susceptibility, etc).
UPS	Un-Interruptible Power Supply.
VAC	Volt AC.
VDC	Volt DC.