



# SW3 CommsInterface How2

**Revision 00A**

**13 June 2024**



# CONTENTS

1	1	GENERAL	3
2	2	TCP NETWORKS	4
	2.1	2.1 PC setting	4
	2.2	2.2 CntrP setting	5
	2.3	2.3 Testing IP Connection	5
	2.4	2.4 SCS_Ping	7
	2.5	2.5 Softwin3 setting	8
	2.6	2.6 Comms Interface Status	9
	2.7	2.7 Main Comms Interface Setup	9
3	3	RS485 SLAN	10
	3.1	3.1 RS484	10
	3.2	3.2 LAN Slaves / Versions	10
	3.3	3.3 CntrP Settings	11
	3.4	3.4 CntrP Test	11
4	4	COMMS ERRORS	12
	4.1	4.1 Off-Line	12
	4.2	4.2 Data not in CntrP	12
	4.2.1	4.2.1 Tokens	13
	4.3	4.3 Debug	13

## Revision History

Version	Date	Person	Reason For Changes
001	2021-05-03	MTL	New Document
002	2021-05-11	MTL	Expanded on Ping
003	2021-05-14	MTL	Add pull-up/dn links, SCS_Ping
004	2021-06-30	MTL	Add Main Comms Interface, SDK type, Comms errors
005	2021-09-30	MTL	Add SLAN slaves / versions
006	2021-10-20	MTL	Clarify Network setting
007	2023-02-14	MTL	Add TCP errors
008	2023-03-07	MTL	CR351-5 Eprom versions
009	2023-07-27	MTL	To network settings via file explorer/network – right-click/properties
00A	2024-06-13	MTL	ID to server – Blocked site / expire

# 1 GENERAL

This document describes how to connect and setup comms between SofrWin3 (SW3) and controllers (CntrP).

**OLD SYSTEMS.** Used (up to 4) PCBs that slotted into the PCI bus of PCs.

These PCBs (product name COM350, call Mux Interfaces) communicated with up to 128 CntrPs via RS485 Local Area Network. New generation PC do not have PCI slots and Windows later than XP does not support such interfaces.

**NEW SYSTEMS.** PC communicate via Ethernet (TCP) to any number of CntrPs.

Each TCP CntrPs can serve as routers (master) to up to 64 CntrPs on a RS485 Sub-LAN (SLAN) as was done by the old PCI interfaces.

**OLD to NEW SYSTEMS.** Given the above – to convert from old (PCI) to new (TCP) requires adding a new CntrP (CR391M) to the system that communicates to the existing RS485 CntrPs.

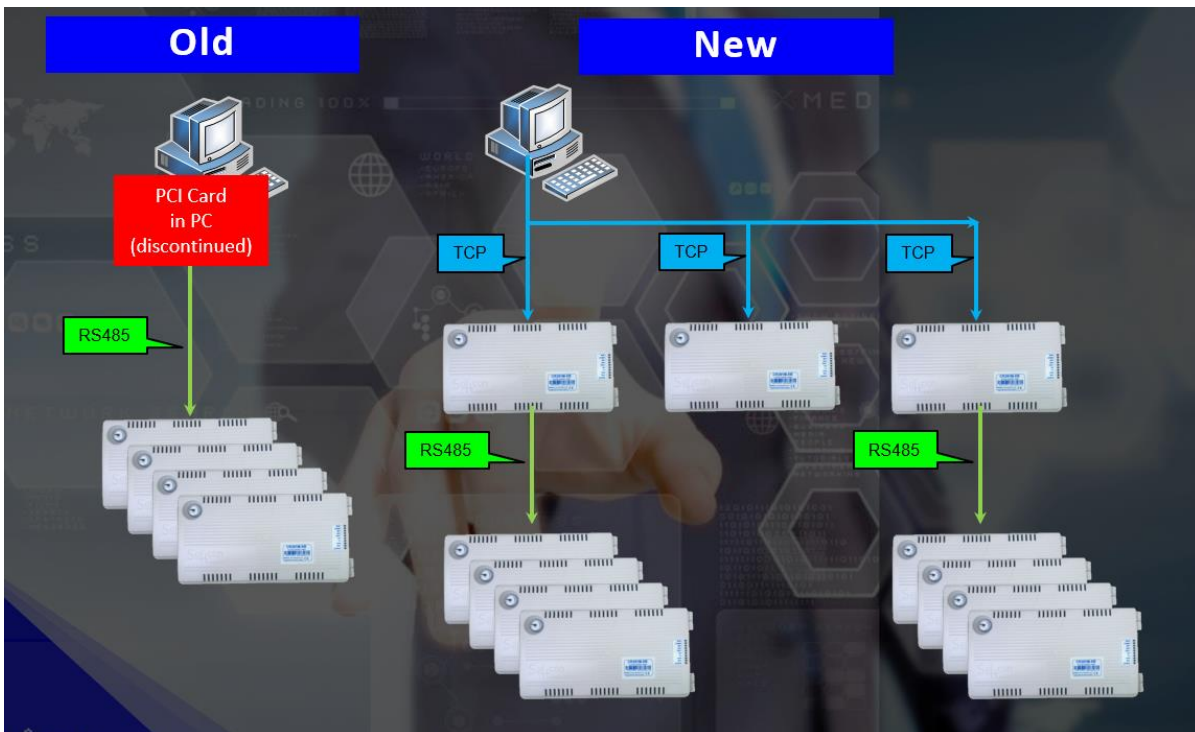
Simply add this CntrP close to the PC and connect to the PC via a network (Ethernet) cable and connect the RS485 cable to this CntrP. This new CntrP can also serve as an access CntrP – simply replace any existing CntrP with this new CntrP and link to the PC and reconnect to RS485.

All FW on the old CntrPs must be updated to the latest version by swapping EPROMs (CR391-5) or upgrading FW via ICD programmer (CR390 and CR391).

The old databases need to be converted.

To transfer all data, versions older than 1.04.32 need to run version 1.04.32 then the later version required.

This step can be omitted – requiring re-setup of Operators and some CntrP dB settings.



# 2 TCP NETWORKS

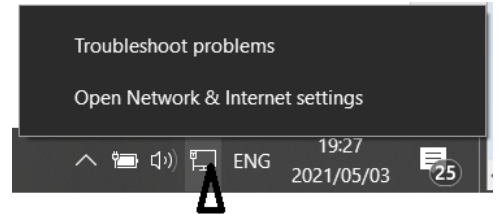
Softcon CntrPs with Ethernet interfaces are:


MODEL	SPEED (Mb)	APPLICATIONS	RS485 SLAN	STATUS
CR390	10	Access	Yes	Discontinued
CR391	10 or 100	Multi	Yes	
CR392	10 or 100	Vending	No	

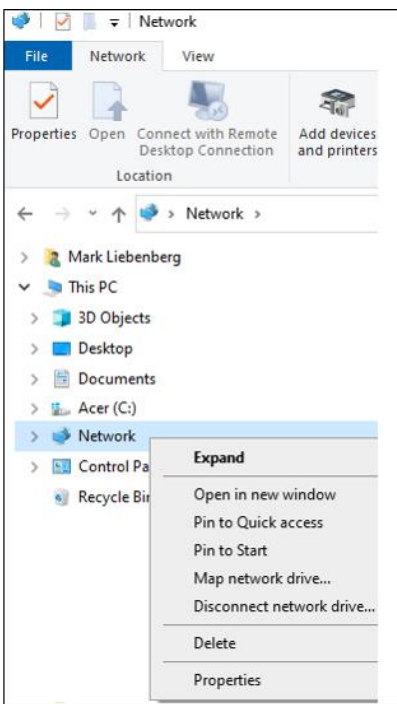
These CntrPs have Ethernet RJ45 connectors with TX and RX LEDs. The RX LED on the left is on when there is activity on the network – generally on indicating there is a network. Then the CntrP answers, the right LED flickers.

## 2.1 PC setting

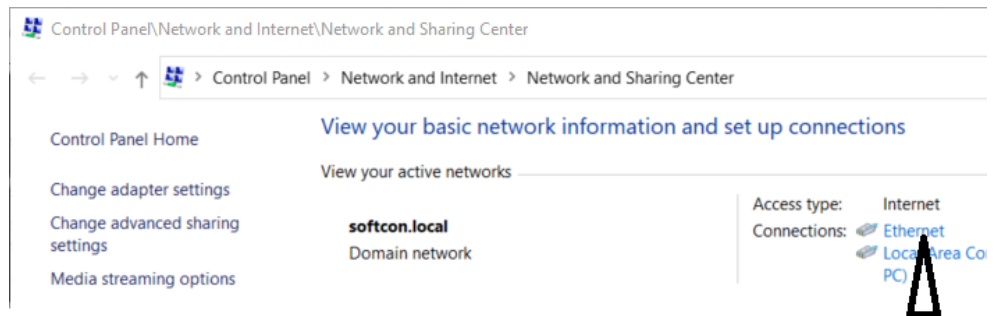
In Windows 10, the PC Ethernet settings are accessed by opening the Network setting, by right click on the Network settings (bottom right of the screen) or by searching Ethernet in the Windows setting.



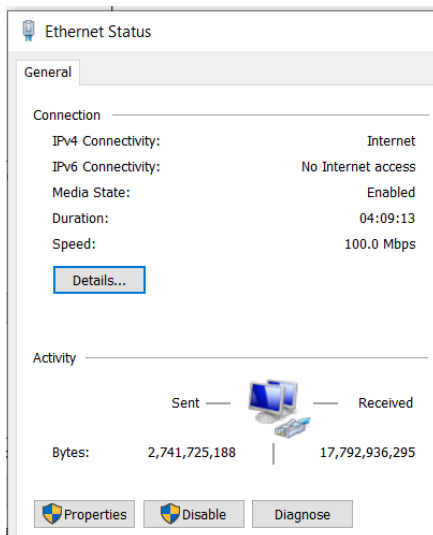
Alternatively – in file explorer,  right click on Network, select properties:



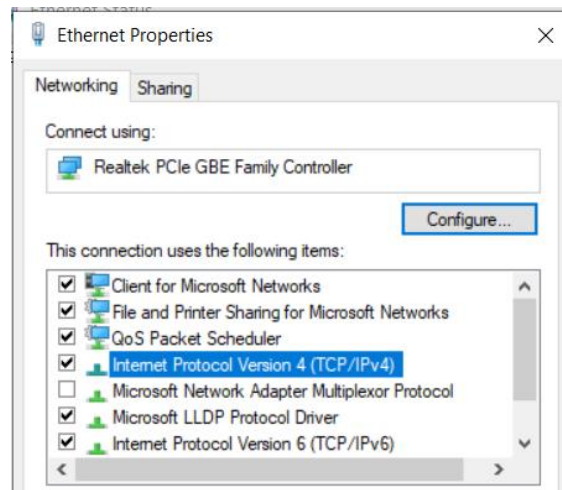
Select the active Ethernet.



and select Properties:



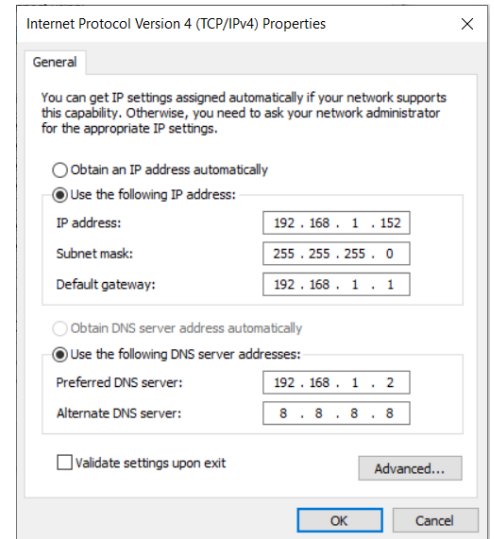
Click TCP/IPv4:



The IP address **must be static** (not automatically).  
Note the CntrPs must be visible in the network,  
e.g. 192.168.1.xxx

The Default gateway and server addresses only required if connected  
via network switches.  
The site IT manager allocates addresses.

**A default gateway must be set, typically the last digit is 1.  
The PC must not have the same address as the gateway.**



## 2.2 CntrP setting

The IP address in the CntrP is set using the Softcon CR375/CR395 HH programmer (plugged into the controller) or using the Detect option in SW3 or SCS\_Controller for CR391 universal mode CntrPs.  
The settings are:

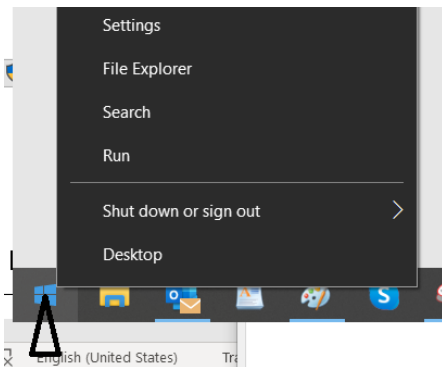
1 SER/IP/MOD/USB  
1 n/PcMast CommsInterface

**The IP address of the CntrP must be in the range of the PC IP address – NOT THE SAME.  
The last digit of the IP address should be more than 10.**

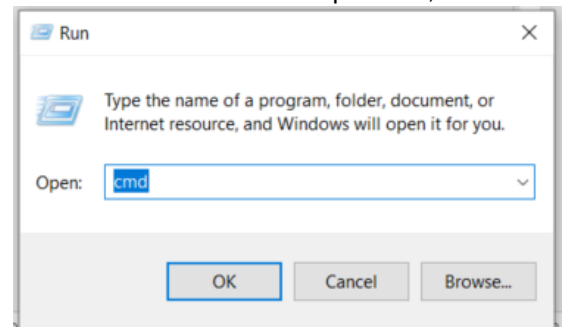
See the CntrP manuals for using the HH.

## 2.3 Testing IP Connection

Right click on the windows Run icon (bottom right) and select Run



Edit CMD in the Open box, and OK



The black CMD window opens.

To check the PC IP settings, enter  
IPCONFIG

Note the IPv4 Address is static, e.g.  
192.168.1.152

```
C:\WINDOWS\system32\cmd.exe
Microsoft Windows [Version 10.0.19041.928]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Mark.SOFTCON>ipconfig

Windows IP Configuration

Wireless LAN adapter Wi-Fi:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . :

Wireless LAN adapter Local Area Connection* 2:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . :

Ethernet adapter Ethernet:

    Connection-specific DNS Suffix  . : softcon.local
    Link-local IPv6 Address . . . . . : fe80::d7f:329c:a186:8aeb%9
    IPv4 Address. . . . . : 192.168.1.152
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : fe80::1:1%9
                                192.168.1.1
```

To test the communication with a CntrP,  
Enter the ping command (ping followed by the  
IP address of the CntrP, e.g.  
ping 192.168.1.156 -t

optionally add -t to continually repeat the ping  
command (if omitted, the ping is done 5 times).  
To stop the continuous ping, select Cnrl C.

In the example, the controller is not reachable,  
hence cable or setting error

```
C:\WINDOWS\system32\cmd.exe - ping 192.168.1.156 -t
Microsoft Windows [Version 10.0.19041.928]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Mark.SOFTCON>ping 192.168.1.156 -t

Pinging 192.168.1.156 with 32 bytes of data:
Reply from 192.168.1.152: Destination host unreachable.
Request timed out.
Request timed out.
Request timed out.
```

When the communication is successful, the  
response time is shown, typically less than  
5msec for 32 bytes.

Time To Live (TTL) – how long the response will  
be available on the network.  
This is initiated by the device that is pinged.

For a CR391 controller, TTL should report:  
TTL = 100 (Typically for a CntrP)

For a computer, TTL will always be:  
TTL = 128 or 127 (Depends on routers or fire walls)

Biometric devices, typically:  
TTL = 64

```
C:\WINDOWS\system32\cmd.exe
C:\Users\Mark.SOFTCON>
C:\Users\Mark.SOFTCON>
C:\Users\Mark.SOFTCON>
C:\Users\Mark.SOFTCON>ping 192.168.1.156 -t

Pinging 192.168.1.156 with 32 bytes of data:
Reply from 192.168.1.156: bytes=32 time=1ms TTL=100
Reply from 192.168.1.156: bytes=32 time=1ms TTL=100
Reply from 192.168.1.156: bytes=32 time=1ms TTL=100
Reply from 192.168.1.156: bytes=32 time<1ms TTL=100
Reply from 192.168.1.156: bytes=32 time<1ms TTL=100
Reply from 192.168.1.156: bytes=32 time=1ms TTL=100
Reply from 192.168.1.156: bytes=32 time<1ms TTL=100
Reply from 192.168.1.156: bytes=32 time=1ms TTL=100
Reply from 192.168.1.156: bytes=32 time=1ms TTL=100

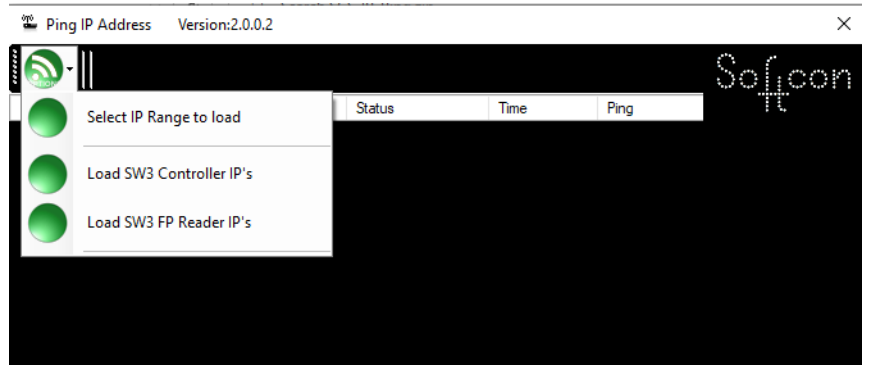
Ping statistics for 192.168.1.156:
    Packets: Sent = 10, Received = 10, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms
Control-C
^C
C:\Users\Mark.SOFTCON>
```

## 2.4 SCS\_Ping

The Softcon tool SCS\_Ping.exe can be used to ping controllers and readers.

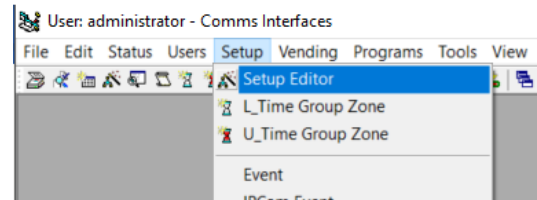
The IP range can be entered or the Controllers and IP readers can be read for the SW3 setup (MS Access databases).

Ping is started by right click on the require controller

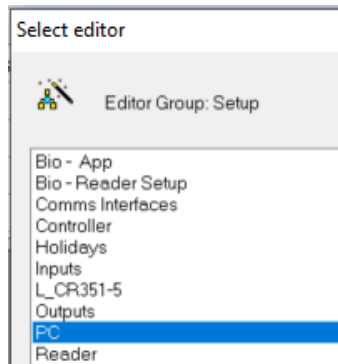


## 2.5 Softwin3 setting

In the SW3 application SCS\_Client, select **Setup / Setup Editor**



Select PC to name edit the PC name



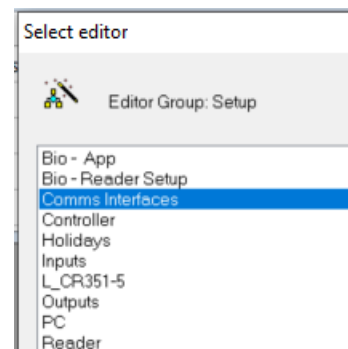
Enter the PC name. The default is local host (will work), but should be changed to the PC name (faster). Note IP address of the PC is required for PC interlinking (not required for CntrP comms). 127.100.1.1 is the same as local host.

**NOTE that SCS\_Client host (on startup) must match the name setting.**

	Name	IP address	Master DT	Expiry_proc	Expiry
1	localhost	192.168.1.152	localhost	✓	0000-0
2	zPC 2				yyyy-rr
3	zPC 3				yyyy-rr

To get the PC name, right click on the Windows Icon (bottom left) and select System, or in the windows menu, enter about. The PC name is the Device Name

Select Comms Interface  
(older SW3 version named Mux Interface)



Name the Comms Interface (CntrP) as required and select the PC (that communicates with the interface). Set the IP comms type as TCPIP and the SDK type:

- Legacy (0)** for non-Universal mode CntrP.
- SDK – Keys (1)** for a universal interface that also stores SDK key information (only 1 must be Keys).
- SDK – Ordinary (2)** for other universal interfaces.

*These options may show as SDK type 0, 1 and 2(SW3 was updated, Report Table not updated)*

**NOTE :** SDK options requires that CntrP has **Universal FW** (version 100+)  
Controllers linked to a SDK Comms interface, must be set as type Universal  
**Universal FW** can do Legacy.

**IP address** of the CntrP – without leading zeros.

The **port** setting must match that set in the CntrP (the default is 56789, the same for all).

**ID to Server** in Comms Interface setup sets that the CntrP holds the SW3 functions (e.g. enabled for Vending) and quantity (e.g. number of readers) keys.

**The keys are linked to the MAC (serial number) of the CntrP PCB.**

The system checks the keys on the 1<sup>st</sup> interface set with ID to server.

If no keys, the system shows blocked.

If no communication, it will check the second set with ID to server – if comms and no keys, blocked.

Keys can be loaded on more than 1 controllers as a fail-safe, i.e. can get keys off another if one fails.

This is only done in limited such as high security sites that have to be on-line.

**Only interfaces with keys must have the setting ID to server.**

Replacing a CntrP that holds the keys, requires new keys.

The faulty PCB serial number is required to identify the site registered to serial number (PCB).

New keys with an expiry date are generated for the site (for the new PCB) by Softcon.

**Expiry is only removed when the old PCB that had the keys is returned to Softcon.**

**Note that Setup>Comms Main mux shows the serial number of the controller that the keys are read from.**



R.	Name	Status	Status DT	ID	Version	PC	Type	SDK Type	IP address	Port	ID to Server	LAN Baud
1	Comms Interface 1	On-line	2021/05/03 20:57:25	D880-3901-2227-0000	CR391u100.13U	localhost	TCP/IP	SDK - Keys	192.168.1.156	56789	localhost	
2	zComms Interface 2	Off-line				none	TCP/IP	Legacy		56789	none	9k6
3	zComms Interface 3	Off-line				none	TCP/IP	Legacy		56789	none	9k6
4	zComms Interface 4	Off-line				none	TCP/IP	Legacy		56789	none	9k6

Note that the list editor may not look as the above, see the SCS\_sw3\_Editor.help.pdf document.

Here the colours are **Blue** or Universal (SDK type not legacy) or **Pink** Legacy.

The faded fields (columns) are not editable and show the status of the interface (automatically updated is the list is saved as live, or updated by selecting F5).

Status is On- or Off-line, and when changed (DateTime).

The ID (mac) read from the CntrP and the FW version in the CntrP.

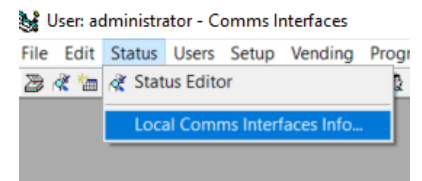
To force the PC to reconnect, change any the Type setting to none, then back to TCP/IP (must be set as editable).

Note that for Legacy, the SLAN (RS485) baud rate (for Universal setting, set in the Serial Setup).

**Comms Interface cannot come on-line if CntrP node is 0 (set with HH programmer)**

## 2.6 Comms Interface Status

To see status of all interfaces, select Status, local Comms Interfaces Info.



The status window shows the online interfaces in green, red for off-line (here shown with right click on the name to select RS485 SLAN Poll Now button).

Name	Version	Status	Out	Nack
Comms Interface 1		rtC	0	0
zComms Interface 2		RTC	1	0

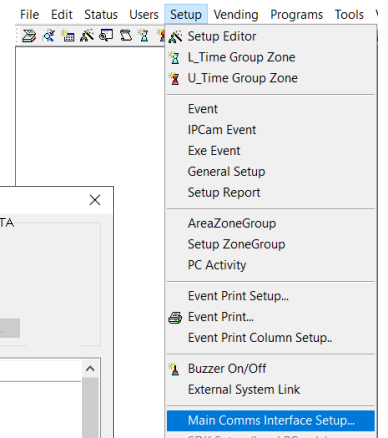
The Status column Flick Receive, Transmit, Control as data is Transmitted and received.

The Out column shows the number of messages to be sent (should go down to zero – if not, the comms is not correct). Nack shows the number of retires (should be zero),

/ reader.

## 2.7 Main Comms Interface Setup

This menu shows what the SW is enabled for.



The Comms interface ID is read from the CntrP (can be seen with HH programmer, version menu).

Keys provided by Softcon (ID and Version required)

Keys are entered in New Settings, then **Add**, when all done **Send**.

This opens all menus (that the licence enables).

Requires PC and Comms interface settings above.  
**SDK type must be correct.**

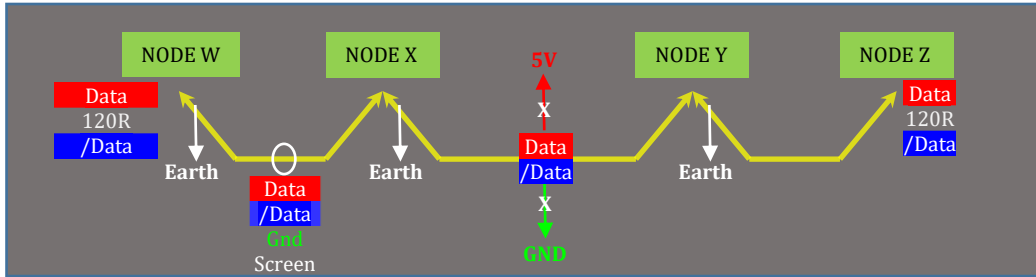
Option	Current	New
Accumulation	Yes	
Asset Track	No	
Attendance	No	
Audio	Yes	
Barcode sc...	No	
Biometric A...	Yes	
Biometric C...	Yes	
Biometric R...	20	
Card Makers	0	

# 3 RS485 SLAN

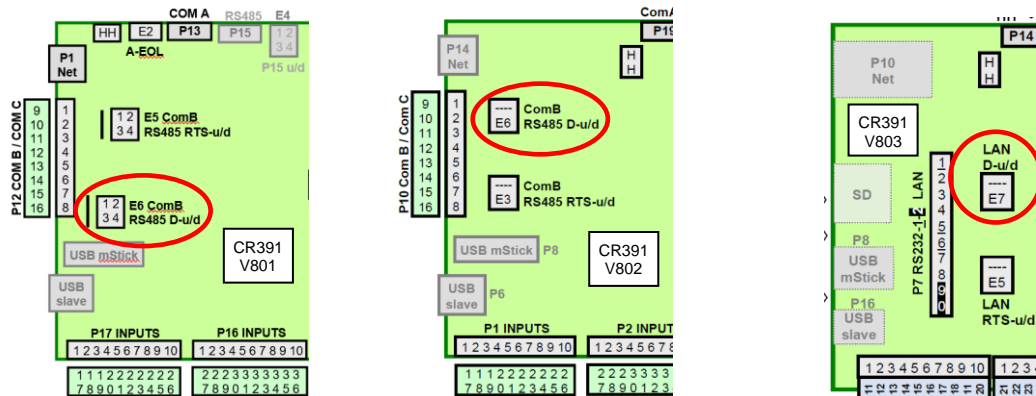
## 3.1 RS484

The RS485 SubLan (SLAN) is a multi-drop network, running from CntrP to CntrP. Anyone with the Ethernet interface to a PC, is the master, all others are slaves.

- Half Duplex, Multi-drop (LAN)
- Differential between Data /Data 0V, 5V
- 2000m



- 2 twisted pairs – Red (Data) / Blue (/Data), Green / Yellow (Gnd)
- Multi-drop loop though (no T's). RS485 Cable runs from device/CntrP to the next, with two cable ends only.
- Screen earthed per segment (between nodes – WX, XY, YZ). No loop through, only one end connected to ground.
- RS485 Data and /Data lines have to be pulled up to 5V and to down Gnd at one CntrP via links on PCB – see CntrP lid insert. See below for the CR391 PCB versions (all links horizontal). Preferably near the middle of long LAN cables – generally done at the master.
- The two ends are terminated with 120ohm between Data and /Data (screw in with cable into terminal).
- All nodes listen (RX), one transmits (TX) at a time.
- Polled – Master TX, to specific node – node replies. If not answer, retried every 5 minutes (or forced by SW3 selection of Status, Comms status, right click, poll – see above).



## 3.2 LAN Slaves / Versions

Legacy controllers CR351-5 can only be SLAN slaves and requires an IP CntrP (CR390 or CR391 M) as master. CR391 (B or M) can be SLAN slave. The CR391 master can be in Legacy or Universal mode.

**CR355 FW must be updated to version 2.60 when SoftWin 1.4.x is installed** (prevents setup to the CR355 causing an error).

CR351-5 does need updates if changing master to CR391 from Mux Card or CR390.

### 3.3 CntrP Settings

Each CntrP on the SLAN requires the following setting (via HH).

Node address      The master is node 1, the others 2, 3, 4, etc).  
 Repeated for every SLAN (each SLAN starts with 1, the 2, 3, 4...  
**NODES CANNOT BE DUPLICATED ON A LAN**  
 Comms Interface cannot come on-line if node is 0

Comms type      **1**=TCP for the master, Slaves are **0**=Serial  
 PcMast          **1**=Comms direct to PC for TCP CntrP, others **0** (none)

< Set-up Comms >
<b>001</b> Node address
1 4/5/C/k/aV/A/F
<b>1</b> Ser/IP/MOD/USB
<b>1</b> n/PcMast Comml

ComB Type      **1**=LAN Slave, **2**=LAN Master  
 ComB Baud      **All must be the same**, generally 0=19k2 or **1=9k6**  
 ComB Bits      0=9 bit  
 ComB Parity    0=None

<b>02</b> ComBt nSMTHCVPF
<b>01</b> ComBr 192/96/48/24
00 ComBi 9/8/7
00 ComBp n/e/o/1/0

### 3.4 CntrP Test

#### On-Line LED.

The second from top LED show the Comms up status and should be on constantly to indicate on-line. If flickering, communication is slow, caused by cable error or CntrP(s) not answering.

#### TX / RX LEDs

Using the HH, the Rx and Tx LEDs on the CntrP can be set to show the status of ComB.  
 Older FW versions select ComType (SLAN Master or Slave), newer versions select ComB .  
 For Master, Tx on shows Master is polling, RX for a slave is answering.  
 For Slave, Rx if master is transmitting, and Tx when the Slave replies.  
 With many Nodes, a slave TX may flicker (off when other Nodes answer).

#### HH – Status / Poll

Via HH connected to the LAN master – select Comms status to show all the node statuses.  
 0=not allocated      1=allocated      2=busy polling      3=Online (normal)

When in this menu, selecting the following keys on the HH result in the following:

- 7      Stop poll.
- 8      Poll all allocated continuously.
- 9      Set all to allocated and poll all continuously.

**To poll a certain slave(s), set that slave(s) to 1, the others to 0 and 8.**

To stop the continuous poll, simply exit the menus by repeatedly selecting \* to top menu (move to menu).

# 4 COMMS ERRORS

## 4.1 Off-Line

### TCP

General problems are:

Cable / network / setup issue:

The PC must be able to ping the CntrP – see the setting above.

Port setting mismatch, or used by another program:

Even if the port setting are wrong, ping still functions.

Firewall must allow port set.

Strict virus checkers to be disabled.

Network Rapid Spanning Tree Protocol (RSTP) must be disabled.

CntrP IP address duplicated:

Switch the CntrP off and check if any answer to a ping.

More than one SCS\_Client is set to link to the CntrP:

Setup/Setup Editor/CommsInterface must have only one PC set to communicate with CntrP.

If CntrP (not faulty) remains on-line with SCS\_Client stopped, indicates connected to another SCS\_Client.

**Comms Interface and CntrP cannot come on-line if CntrP node is 0 (set with HH programmer).**

To eliminate the CntrP as faulty, connect the CntrP directly to the PC running SCS\_Client.

### RS485

See CntrP test above.

## 4.2 Data not in CntrP

If the CntrP is on-line and transactions are received, but Setup or Reset does not send data the following:

### UPDATE Controller data

The fields **Update Cards** (tokens) and **Update Setup** in setup/controllers indicate the status the of download to the controller. If these fields are not visible in the controller list – right click on any column description (e.g. on Description) and move these field from left (not visible) to the right. If required to edit (see next), click on the eye icon to change to a pencil.

0=no data to be sent

1=set for data to be sent

2=busy sending (out in the local comms status will run up, then down – see Comms Interface Status above

If the status remains 1, an unrecoverable failure could have occurred (newer Softwin3 versions can correct most failures). If remains 1, edit back to 0 (make visible and editable as in previous paragraph).

### CORRUPT RECORD

The record in the Controller table could be corrupt.

See SCS\_sw3\_dB.how2.help on how to remove and add the record.

## 4.2.1 Tokens

**DB LOCATION.** Tokens are sent to controllers if the reader dB Location is set to Cntrl All (default). If set to PC all, the PC grants or denies access. See Reader setup for this option.

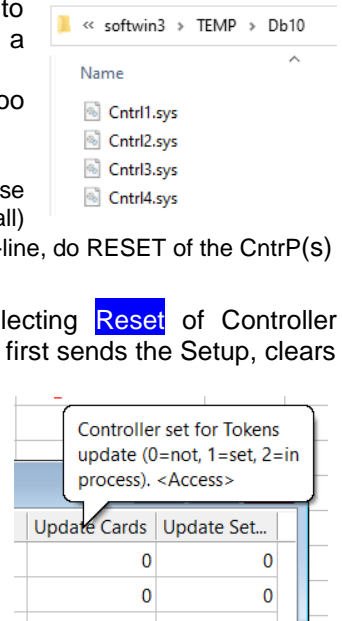
**DB MODE.** Mode is 2 (running number) or 10 (random token numbers) – see SCS\_Client.help.

When random, SW3 uses reference tables linking users (card) database record to each CntrP reference (only token that have access via a reader connected to a CntrP are in the CntrP dB).

The last time the token had access is also recorded – should the CntrP dB be too small, the oldest record is overwritten.

**dB10.sys.** If tokens are failing to download, close SCS\_Client and stop or close SCS\_Server (requires Server logon) and delete the appropriate (or all) c:\Softwin3\temp\db10 ?? .sys file(s). Start SCS\_Server and SCS\_Client and when on-line, do RESET of the CntrP(s)

**RESET.** If the CntrP is on-line, tokens can be sent to CntrP when selecting **Reset** of Controller (Setup/Controllers – right click on required CntrP, select Reset). Note that Reset first sends the Setup, clears all tokens and then send only the token that have access at either reader.



**ENABLED event.** When badging and token is not found in the CntrP dB, out-of-area is reported.

If the token should have access, SW3 enable the token in the CntrP (if received by the CntrP within 5 seconds, the lock is activated – else the next badge will grant access).

If Enabled continuously occurs:

- Delete the **dB10 .sys** file (see dB.sys in DB Mode above).
- If not 0, change Update Cards to 0 in the controller setup (see Reset above).

**NO READER events.** If CntrP is online (I/O events are **received**), but no reader events, check the following in reader setup

- Reader Isolated (disabled via a PC event)
- Reader Disabled (on Input or Time-group)

## 4.3 Debug

With a HH (CR375, CR395), the number of tokens enabled in the local dB can be shown.

The Mux message Tool can be started – showing events to and from the controller.

If Tools Comms Interface Message is greyed, select Test Options and enable Mux Log Messages.

**NOT COMPLETED**

