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Installation Guide

RENSCAN 200

SCANNING SYSTEM FOR MACHINE TOOLS

RENISHAW 

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CHANGES TO EQUIPMENT: Renishaw reserve the right to change its equipment without obligation to change equipment previously sold.

WARRANTY: Equipment requiring attention under warranty must be returned to your supplier. No claims will be considered where equipment has been incorrectly installed or misused, or where repairs or adjustments have been attempted by unauthorised persons. Prior consent must be obtained in instances where Renishaw® equipment is to be substituted or omitted. Failure to comply with this requirement will invalidate the warranty

PATENTS: Features of the Renishaw® RENSCAN 200 Retrofit Scanning System for Machine Tools are subject to the following patents and patent applications:

EP 407489
JP 502608/1991
US 5088208



This product has been tested to the following European Standards:

BS EN 50081-2
BS EN 50082-2

It complies with the relevant essential health and safety protection requirements of the following EC Directives:

89/336/EEC, 91/263/EEC, 92/31/EEC (EMC), 93/68/EEC (CE Marking)

All relevant safety information, including that incorporated in this Installation Guide, must be observed.

FCC

Information to User (FCC Section 15.105)

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not used in accordance with this Installation Guide, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case you will be required to correct the interference at your own expense.

Information to User (FCC Section 15.21)

The user is cautioned that any changes or modifications, not expressly approved by Renishaw plc or authorised representative, could void the user's authority to operate the equipment.

Special Accessories (FCC Section 15.27)

The user is cautioned that any peripheral device installed with this equipment, such as a computer, must be connected with a high-quality shielded cable to ensure compliance with FCC limits.

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List of associated publications

Title	Publication number
SP2-1 Installation Guide	H-2000-5110
SP2-1 User's Guide	H-2000-5115

Consolidated list of warnings and cautions

WARNINGS

1. INSTALLATION OF THE RETROSCAN SCANNING SYSTEM MUST ONLY BE UNDERTAKEN BY FULLY QUALIFIED PERSONNEL WHO ARE FULLY CONVERSANT WITH ALL SAFETY PROCEDURES AND LEGISLATION IN FORCE IN THE COUNTRY OF USE.
2. INSTALLATION OF THE RENSCAN UPGRADE KIT MUST ONLY BE UNDERTAKEN BY FULLY QUALIFIED PERSONNEL WHO ARE FULLY CONVERSANT WITH ALL SAFETY PROCEDURES AND LEGISLATION IN FORCE IN THE COUNTRY OF USE.
3. DO NOT ATTEMPT TO ACCESS THE MACHINE TOOL'S CIRCUITRY WITHOUT FIRST ISOLATING ITS ELECTRICAL POWER SUPPLY.

CAUTIONS

1. THE COUNTER CARD IS SUBJECT TO DAMAGE BY STATIC DISCHARGE. IT IS THEREFORE RECOMMENDED THAT THE USE OF AN ANTI-STATIC WRISTBAND, CONNECTED TO A SUITABLE EARTH POINT, IS EMPLOYED WHENEVER THE CARD IS HANDLED. MOVEMENT, WHICH CAN GENERATE STATIC ELECTRICITY, SHOULD ALSO BE KEPT TO A MINIMUM.
2. THE FOLLOWING INSTRUCTIONS ARE OF A GENERAL NATURE. FOR SPECIFIC INFORMATION/INSTRUCTIONS ON HOW THE COUNTER CARD MUST BE INSTALLED INTO YOUR PERSONAL COMPUTER (PC), REFER TO THE USER/TECHNICAL REFERENCE MANUAL SUPPLIED WITH YOUR PC.
3. OBSERVE ANTI-STATIC PRECAUTIONS AT ALL TIMES. FAILURE TO ADEQUATELY PROTECT AGAINST STATIC DISCHARGE CAN RESULT IN DAMAGE TO THE PROBE INTERFACE CARD.
4. TO AVOID DAMAGE TO THE PROBE OCCURRING WHEN TRAVELLING IN THE Z AXIS IT IS IMPORTANT TO ENSURE THAT, WHEN SELECTING A SOCKET CAPSCREW OR FIXED LOCATION INTO/AGAINST WHICH THE PIN ASSEMBLY CAN BE LOCATED, THE CHOSEN LOCATION WILL TRAVEL IN THE Z DIRECTION WITH THE SPINDLE.

Consolidated list of warnings and cautions (continued)

CAUTIONS

5. THE PROBE INTERFACE CARD IS SUBJECT TO DAMAGE BY STATIC DISCHARGE. IT IS THEREFORE RECOMMENDED THAT THE USE OF AN ANTI-STATIC WRISTBAND, CONNECTED TO A SUITABLE EARTH POINT, IS EMPLOYED WHENEVER THE CARD IS HANDLED. MOVEMENT, WHICH CAN GENERATE STATIC ELECTRICITY, SHOULD ALSO BE KEPT TO A MINIMUM.
6. THE FOLLOWING INSTRUCTIONS ARE OF A GENERAL NATURE. FOR SPECIFIC INFORMATION/INSTRUCTIONS ON HOW THE PROBE INTERFACE CARD MUST BE INSTALLED INTO YOUR PERSONAL COMPUTER (PC), REFER TO THE USER/TECHNICAL REFERENCE MANUAL SUPPLIED WITH YOUR PC.
7. WHEN ROUTING THE PROBE CABLE ASSEMBLY FROM YOUR SP2-1 PROBE TO YOUR PC, IT IS ESSENTIAL THAT THE CABLE IS KEPT WELL AWAY FROM MOVING PARTS WHICH MAY SNAG, ENTANGLE, TRAP OR SEVER IT WHEN THE MACHINE TOOL IS IN MOTION. IT IS ALSO VERY IMPORTANT THAT SUFFICIENT 'SLACK' IS PROVIDED TO ALLOW THE MACHINE TOOL TO MOVE WITHIN ITS ENTIRE OPERATING ENVELOPE WITHOUT CAUSING ANY STRAINING OF THE CABLE.

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Liste des conseils et avertissements

AVERTISSEMENTS

1. SEULS DES TECHNICIENS QUALIFIES CONNAISSANT TOUTES LES PROCEDURES ET REGLES DE SECURITE EN VIGUEUR DANS LE PAYS D'EXPLOITATION SONT AUTORISES A INSTALLER LE SYSTEME DE DIGITALISATION RETROSCAN.
2. SEULS DES TECHNICIENS QUALIFIES CONNAISSANT TOUTES LES PROCEDURES ET REGLES DE SECURITE EN VIGUEUR DANS LE PAYS D'EXPLOITATION SONT AUTORISES A INSTALLER LE KIT DE MISE A NIVEAU RENSCAN.
3. NE TENTER AUCUNE INTERVENTION SUR LES CIRCUITS ELECTRIQUES DE LA MACHINE-OUTIL SANS L'AVOIR AUPARAVANT ISOLEE DU SECTEUR.

CONSEILS

1. LA CARTE COMPTEUR EST SENSIBLE AUX CHARGES ELECTROSTATIQUES. NOUS RECOMMANDONS DONC D'UTILISER UNE DRAGONNE ANTISTATIQUE CORRECTEMENT MISE A LA TERRE POUR MANIPULER LA CARTE. LES MOUVEMENTS CREENT DE L'ELECTRICITE STATIQUE, ILS DOIVENT DONC ETRE REDUITS AU MINIMUM.
2. LES INSTRUCTIONS CI-APRES SONT DE CARACTERE GENERAL. POUR TOUTE INFORMATION/INSTRUCTION SPECIFIQUE CONCERNANT L'INSTALLATION DE LA CARTE COMPTEUR SUR VOTRE PC, VEUILLEZ CONSULTER LE MANUEL DE L'UTILISATEUR/LA NOTICE TECHNIQUE LIVRES AVEC VOTRE PC.
3. TOUJOURS SUIVRE LES CONSEILS DE PROTECTION CONTRE LES CHARGES ELECTROSTATIQUES POUR NE PAS ENDOMMAGER LA CARTE D'INTERFACE (CC1) DU PALPEUR.
4. SI LE PALPEUR EST EQUIPE D'UN SYSTEME ANTI-ROTATION, IL EST IMPORTANT POUR NE PAS ABIMER LE PALPEUR QUE LE POINT D'ATTACHE DE L'INDEX SOIT SOLIDAIRE DE L'AXE DES Z ET SE DEPLACE AVEC LUI.

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Liste des conseils et avertissements (suite)

CONSEILS

5. LA CARTE D'INTERFACE DU PALPEUR EST SENSIBLE AUX CHARGES ELECTROSTATIQUES. NOUS RECOMMANDONS DONC D'UTILISER UNE DRAGONNE ANTISTATIQUE CORRECTEMENT MISE A LA TERRE POUR MANIPULER LA CARTE. LES MOUVEMENTS CREENT DE L'ELECTRICITE STATIQUE, ILS DOIVENT DONC ETRE REDUITS AU MINIMUM.
6. LES INSTRUCTIONS CI-APRES SONT DE CARACTERE GENERAL. POUR TOUTE INFORMATION/INSTRUCTION SPECIFIQUE CONCERNANT L'INSTALLATION DE LA CARTE D'INTERFACE DU PALPEUR SUR VOTRE PC, VEUILLEZ CONSULTER LE MANUEL DE L'UTILISATEUR/LA NOTICE TECHNIQUE LIVRES AVEC VOTRE PC.
7. LORS DE L'INSTALLATION DU CABLE DU SP2-1, IL EST ESSENTIEL D'ELOIGNER LE CABLE DES PIECES MOBILES SUSCEPTIBLES DE L'USER, L'EMBROUILLER, LE BLOQUER OU LE COUPER LORSQUE LA MACHINE-OUTIL EST EN SERVICE. IL EST AUSSI TRES IMPORTANT DE DONNER ASSEZ DE MOU AU CABLE POUR QUE LA MACHINE-OUTIL PUISSE SE DEPLACER DANS SON PERIMETRE D'EXPLOITATION SANS CONTRAINTE POUR LE CABLE.

ITALIANO

Sommario delle avvertenze e degli avvertimenti

AVVERTENZE

1. LE OPERAZIONI DI INSTALLAZIONE DEL SISTEMA DI SCANSIONE RETROSCAN DEVONO ESSERE ESCLUSIVAMENTE ESEGUITE DA PERSONALE SPECIALIZZATO E AL CORRENTE DELLE PROCEDURE E DELLA LEGISLAZIONE ANTINFORTUNISTICA VIGENTE NEL PAESE D'INSTALLAZIONE.
2. LE OPERAZIONI DI INSTALLAZIONE DEL KIT DI UPGRADE RENSCAN DEVONO ESSERE ESCLUSIVAMENTE ESEGUITE DA PERSONALE SPECIALIZZATO E AL CORRENTE DELLE PROCEDURE E DELLA LEGISLAZIONE ANTINFORTUNISTICA VIGENTE NEL PAESE D'INSTALLAZIONE.
3. E' ASSOLUTAMENTE VIETATO L'ACCESSO AL CIRCUITO ELETTRICO DELLA MACCHINA SE NON DOPO AVER PROVVEDUTO AD ISOLARLA DALL'ALIMENTAZIONE ELETTRICA.

AVVERTIMENTI

1. LA SCARICA STATICA PUÒ DANNEGGIARE LA SCHEDA CONTATORE. SI CONSIGLIA QUINDI DI INDOSSARE UN CINTURINO ANTI-STATICO, COLLEGATO A UN PUNTO DI MASSA IDONEO, OGNI VOLTA CHE SI DEVE MANEGGIARE LA SCHEDA. CERCARE ANCHE DI CONTENERE AL MINIMO I MOVIMENTI, DATO CHE QUESTI CREANO ELETTRICITÀ STATICA.
2. LE SEGUENTI ISTRUZIONI SONO DI NATURA GENERICA. PER I DETTAGLI RELATIVI ALLE ISTRUZIONI DI INSTALLAZIONE DELLA SCHEDA CONTATORE SUL VOSTRO PERSONAL, CONSULTARE IL MANUALE D'USO E DI RIFERIMENTO FORNITO INSIEME AL PC.
3. OSSERVARE SEMPRE LE PRECAUZIONI PER EVITARE IL FORMARSI DI SCARICHE ELETTROSTATICHE. L'INOSSERVANZA DI QUESTA ISTRUZIONE POTREBBE AVERE LA CONSEGUENZA DI DANNEGGIARE LA SCHEDA INTERFACCIA DELLA SONDA (CC1).

ITALIANO

Sommario delle avvertenze e degli avvertimenti (continua)

AVVERTIMENTI

4. ONDE EVITARE DANNI ALLA SONDA IN FASE DI SPOSTAMENTO SULL'ASSE Z, ALL'ATTO DELLA SELEZIONE DI UNA VITE A BRUGOLA O DI UN PUNTO IN CUI O CONTRO IL QUALE SISTEMARE LA SPINA DI APPOGGIO, E' ESSENZIALE CHE LA POSIZIONE PRESCELTA SI SPOSTI LUNGO L'ASSE Z INSIEME AL MANDRINO.
5. LA SCARICA STATICA PUÒ DANNEGGIARE LA SCHEDA INTERFACCIA DEL TASTATORE. SI CONSIGLIA QUINDI DI INDOSSARE UN CINTURINO ANTI-STATICO, COLLEGATO A UN PUNTO DI MASSA IDONEO, OGNI VOLTA CHE SI DEVE MANEGGIARE LA SCHEDA. CERCARE ANCHE DI CONTENERE AL MINIMO I MOVIMENTI, DATO CHE QUESTI CREANO ELETTRICITÀ STATICA.
6. LE SEGUENTI ISTRUZIONI SONO DI NATURA GENERICA. PER I DETTAGLI RELATIVI ALLE ISTRUZIONI DI INSTALLAZIONE DELLA SCHEDA INTERFACCIA SONDA SUL VOSTRO PERSONAL COMPUTER (PC), CONSULTARE IL MANUALE D'USO E DI RIFERIMENTO FORNITO INSIEME AL PC.
7. PER LA SISTEMAZIONE DEL CABLAGGIO FRA LA SONDA SP2-1 ED IL PERSONAL, E' IMPORTANTE TENERE IL CAVO A DISTANZA DA COMPONENTI IN MOVIMENTO CHE POTREBBERO INTRAPPOLARLO, AVVOLGERLO O PERSINO TAGLIARLO QUANDO LA MACCHINA E' IN FUNZIONE. E' IMPORTANTE ANCHE LASCIARE UNA RICCHEZZA CAVO CHE CONSENTA ALLA MACCHINA DI SPOSTARSI SENZA FORZARLO ENTRO IL VOLUME OPERATIVO DI LAVORO.

ESPAÑOL

Lista de advertencias y precauciones

ADVERTENCIAS

1. LA INSTALACION DEL SISTEMA DE COPIADO RETROSCAN SOLO DEBE SER REALIZADA POR PERSONAS PLENAMENTE CUALIFICADAS QUE CONOZCAN BIEN TODOS LOS PROCEDIMIENTOS DE SEGURIDAD Y LA LEGISLACION VIGENTE EN EL PAIS DE USO.
2. LA INSTALACION DEL EQUIPO DE PERFECCIONAMIENTO RENSCAN SOLO DEBE SER REALIZADA POR PERSONAS PLENAMENTE CUALIFICADAS QUE CONOZCAN BIEN TODOS LOS PROCEDIMIENTOS DE SEGURIDAD Y LA LEGISLACION VIGENTE EN EL PAIS DE USO.
3. NO INTENTAR ACCEDER AL CONJUNTO DE CIRCUITOS DE LA MAQUINA HERRAMIENTA SIN ANTES AISLAR LA FUENTE DE ALIMENTACION ELECTRICA.

PRECAUCIONES

1. LA DESCARGA DE ELECTRICIDAD ESTATICA PUEDE DAÑAR LA TARJETA CONTADORA. POR LO TANTO RECOMENDAMOS EL USO DE UNA MUÑEQUERA ANTIESTATICA, CONECTADA A UN PUNTO DE TIERRA APROPIADO SIEMPRE QUE LA TARJETA SEA MANIPULADA. EL MOVIMIENTO, QUE PUEDE GENERAR ELECTRICIDAD ESTATICA, TAMBIEN DEBE REDUCIRSE AL MINIMO.
2. LAS SIGUIENTES INSTRUCCIONES SON DE CARACTER GENERAL. PARA INFORMACION/INSTRUCCIONES MAS ESPECIFICAS SOBRE EL METODO DE INSTALACION DE LA TARJETA CONTADORA EN SU ORDENADOR PERSONAL (PC), REMITIRSE AL MANUAL DE REFERENCIA DEL USUARIO/TECNICO QUE SE SUMINISTRA CON EL PC.
3. RESPETAR LAS PRECAUCIONES ANTIESTATICAS EN TODO MOMENTO. DE NO TOMAR LAS PRECAUCIONES ADECUADAS CONTRA LA DESCARGA DE ELECTRICIDAD ESTATICA SE CORRE EL RIESGO DE DAÑAR LA TARJETA DE INTERCONEXION DE LA Sonda (CC1)

ESPAÑOL

Lista de advertencias y precauciones (continúa)

PRECAUCIONES

4. PARA EVITAR QUE LA SONTA SUFRA DAÑOS A LA HORA DE DESPLAZARSE EN EL EJE VERTICAL, ES IMPORTANTE, AL SELECCIONAR UN CASQUILLO DE ROSCA O LUGAR FIJO EN/CONTRA EL CUAL EL CONJUNTO DE LA CLAVIJA PUEDA SER LOCALIZADO, ASEGURAR QUE EL PUNTO ELEGIDO SEA CAPAZ DE DESPLAZARSE EN DIRECCION VERTICAL JUNTO CON EL HUSILLO.
5. LA DESCARGA DE ELECTRICIDAD ESTATICA PUEDE DAÑAR LA TARJETA DE INTERCONEXION DE LA SONTA. POR LO TANTO RECOMENDAMOS EL USO DE UNA MUÑEQUERA ANTIESTATICA, CONECTADA A UN PUNTO DE TIERRA APROPIADO SIEMPRE QUE LA TARJETA SEA MANIPULADA. EL MOVIMIENTO, QUE PUEDE GENERAR ELECTRICIDAD ESTATICA, TAMBIEN DEBE REDUCIRSE AL MINIMO.
6. LAS SIGUIENTES INSTRUCCIONES SON DE CARACTER GENERAL. PARA INFORMACION/INSTRUCCIONES MAS ESPECIFICAS SOBRE EL METODO DE INSTALACION DE LA TARJETA DE INTERCONEXION DE LA SONTA EN SU ORDENADOR PERSONAL (PC), REMITIRSE AL MANUAL DE REFERENCIA DEL USUARIO/TECNICO QUE SE SUMINISTRA CON EL PC.
7. A LA HORA DE ORIENTAR EL CONJUNTO DEL CABLE DE LA SONTA DESDE LA SONTA SP2-1 A SU PC, RESULTA IMPRESCINDIBLE MANTENER EL CABLE BIEN ALEJADO DE LAS PARTES MOVILES QUE PODRIAN ENGANCHAR, ENREDAR, PILLAR O CORTARLO CUANDO LA MAQUINA HERRAMIENTA ESTA EN MOVIMIENTO. TAMBIEN RESULTA MUY IMPORTANTE ASEGURAR QUE LA MAQUINA HERRAMIENTA PUEDA DESPLAZARSE DENTRO DEL CAMPO DE OPERACION COMPLETO SIN QUE SE PRODUZCAN ESTIRONES DEL CABLE.

NEDERLANDS

Waarschuwingen en veiligheidsmaatregelen

WAARSCHUWINGEN

1. DE INSTALLATIE VAN HET RETROSCAN SCANNING SYSTEEM DIENT UITSLUITEND DOOR BEVOEGD PERSONEEL TE WORDEN VERRICHT DAT VOLLEDIG BEKEND IS MET ALLE VEILIGHEIDSPROCEDURES EN DE WETGEVING DIE IN HET BETREFFENDE LAND VAN KRACHT IS.
2. INSTALLATIE VAN DE RENSCAN UPGRADE KIT DIENT UITSLUITEND DOOR BEVOEGD PERSONEEL TE WORDEN VERRICHT DAT VOLLEDIG BEKEND IS MET ALLE VEILIGHEIDSPROCEDURES EN DE WETGEVING DIE IN HET BETREFFENDE LAND VAN KRACHT IS.
3. PROBEER GEEN TOEGANG TOT HET SCHAKELSCHEMA VAN HET GEREEDSCHAP TE VERKRIJGEN ZONDER EERST DE ELECTRISCHE VOEDING TE ISOLEREN.

VEILIGHEIDSMATREGELEN

1. DE COUNTER CARD KAN DOOR STATISCHE ONTLADING WORDEN BESCHADIGD. WIJ ADVISEREN DAAROM DAT ER TIJDENS HET HANTEREN VAN DE KAART EEN ANTI-STATISCHE POLSBAND, VERBONDEN MET EEN AARDINGSPUNT, WORDT GEDRAGEN. BEWEGING, DIE STATISCHE ELECTRICITEIT OP KAN WEKKEN, DIENT TEvens TOT EEN MINIMUM BEPERKT TE WORDEN.
2. DE VOLGENDE INSTRUCTIES HEBBEN EEN ALGEMEEN KARAKTER. VOOR SPECIFIEKE INFORMATIE/INSTRUCTIES BETREFFENDE DE INSTALLATIE VAN DE COUNTER CARD IN DE PC WORDT U VERWEZEN NAAR HET GEBRUIKERS/TECHNISCH HANDBOEK DAT MET UW PC GELEVERD WERD.
3. NEEM TE ALLEN TIJDE ANTI-STATISCHE VOORZORGSMATREGELEN IN ACHT. ALS DEZE MATREGELEN NIET IN ACHT WORDEN GENOMEN KAN DIT IN SCHADE AAN DE SONDE INTERFACE CARD (CC1) RESULTEREN.

NEDERLANDS

Waarschuwingen en veiligheidsmaatregelen (vervolg)

VEILIGHEIDSMATREGELEN

4. OM TE VOORKOMEN DAT DE SONDE TIJDENS VERPLAATSING IN DE Z-AS WORDT BESCHADIGD IS HET BELANGRIJK DAT, TIJDENS DE SELECTIE VAN DE TAPBOUT OF LOKATIE WAARIN/TEGEN DE PENMONTAGE GEPLAATST KAN WORDEN, DE GEKOZEN LOKATIE EVENEENS MET DE AS IN DE Z - RICHTING VERPLAATST.
5. DE SONDE INTERFACE CARD KAN DOOR STATISCHE ONTLADING WORDEN BESCHADIGD. WIJ ADVISEREN DAAROM DAT ER TIJDENS HET HANTEREN VAN DE KAART EEN ANTI-STATISCHE POLSBAND, VERBONDEN MET EEN GESCHIKT AARDINGSPUNT, WORDT GEDRAGEN. BEWEGING, DIE STATISCHE ELECTRICITEIT OP KAN WEKKEN, DIENT TEvens TOT EEN MINIMUM BEPERKT TE BLIJVEN.
6. DE VOLGENDE INSTRUCTIES HEBBEN EEN ALGEMEEN KARAKTER. VOOR SPECIFIEKE INFORMATIE/INSTRUCTIES BETREFFENDE DE INSTALLATIE VAN DE SONDE INTERFACE CARD IN DE PC WORDT U VERWEZEN NAAR HET GEBRUIKERS/TECHNISCH HANDBOEK DAT MET UW PC GELEVERD WERD.
7. DE SONDEKABEL VAN DE YW SP2-1 NAAR DE PC, DIENT VOLLEDIG VRIJ GEHOUDEN TE WORDEN VAN BEWEGENDE DELEN EN MAG DE BEWEGING VAN DE SONDE IN GEEN GEVAL HINDEREN.

DEUTSCH

Zusammenfassung der Sicherheitsbestimmungen

1. DIE INSTALLATION DES RETROSCAN SYSTEMS DARF NUR DURCH EINEN ERFAHRENEN UND ENTSPRECHEND GESCHULTEN TECHNIKER Vorgenommen werden, der mit den zur Zeit im Land des Anwenders geltenden Sicherheitsvorschriften vollkommen vertraut ist.
2. DIE INSTALLATION DES RENSCAN UPGRADE KIT DARF NUR DURCH EINEN ERFAHRENEN UND ENTSPRECHEND GESCHULTEN TECHNIKER Vorgenommen werden, der mit den zur Zeit im Land des Anwenders geltenden Sicherheitsvorschriften vollkommen vertraut ist.
3. VERSUCHEN SIE NICHT IN DEN ELEKTRISCHEN SCHALTKEIS DER MASCHINE EINZUGREIFEN, OHNE VORHER DIE STROMVERSORGUNG UNTERBROCHEN ZU HABEN.

SICHERHEITSBESTIMMUNGEN

1. DIE ZÄHLERKARTE IST EMPFINDLICH GEGEN ELEKTROSTATISCHE ENTLADUNG. AUS DIESEM GRUND WIRD EMPFOHLEN, DASS DER BEDIENER BEI DER HANDHABUNG DER ZÄHLERKARTE EIN ANTISTATISCHES, GEERDETES ARMBAND TRÄGT. BEWEGUNGEN, DIE ZU EINER STATISCHEN AUFLADUNG FÜHREN KÖNNTEN, SOLLTEN AUF EIN MINIMUM REDUZIERT WERDEN.
2. DIE FOLGENDEN SICHERHEITSBESTIMMUNGEN SIND GENERELLER NATUR. GENAUE ANLEITUNG UND INFORMATIONEN HINSICHTLICH DER INSTALLATION DER ZÄHLERKARTE IN DEN COMPUTER (PC), DURCH IHREN TECHNIKER, ENTNEHMEN SIE BITTE DEM ANWENDERHANDBUCH IHRES COMPUTERS.
3. DIE ANTISTATISCHEN VORSICHTSMASSNAHMEN SIND EINZUHALTEN. BEI NICHTBEACHTEN DIESER MASSNAHMEN KÖNNTE ES ZU EINER ELEKTROSTATISCHEN ENTLADUNG KOMMEN, DIE ZÄHLERKARTE (CC1) BESCHÄDIGEN KÖNNTE.

DEUTSCH

Zusammenfassung der Sicherheitsbestimmungen **(Fortsetzung)**

SICHERHEITSBESTIMMUNGEN

4. UM BESCHÄDIGUNGEN DES TASTERS BEI EINER VERFAHRBEWEGUNG IN Z ZU VERMEIDEN, SOLLTE SICHERGESTELLT WERDEN, DASS DER BEFESTIGUNGSPUNKT DER VERDREHSICHERUNG (KOPF EINER INNENSECHSKANTSCHRAUBE / BOHRUNG) MIT DER SPINDEL IN DER Z-ACHSE BEWEGT WIRD.
5. DIE ZÄHLERKARTE IST EMPFINDLICH GEGEN ELEKTROSTATISCHE ENTLADUNG. AUS DIESEM GRUND WIRD EMPFOHLEN, DASS DER BEDIENER BEI DER HANDHABUNG DIESER ZÄHLERKARTE EIN ANTISTATISCHES, GEERDETES ARMBAND TRÄGT. BEWEGUNGEN, DIE ZU EINER STATISCHEN AUFLADUNG FÜHREN, SOLLTEN AUF EIN MINIMUM REDUZIERT WERDEN.
6. DIE FOLGENDEN SICHERHEITSBESTIMMUNGEN SIND GENERELLER NATUR. GENAUE ANLEITUNG UND INFORMATIONEN HINSICHTLICH DER INSTALLATION DER ZÄHLERKARTE IN DEN COMPUTER (PC), DURCH IHREN TECHNIKER, ENTNEHMEN SIE BITTE DEM ANWENDERHANDBUCH IHRES COMPUTERS.
7. DAS ANSCHLUSSKABEL DES SP2-1 ZUM PC SOLLTE SO VERLEGT WERDEN, DASS ES BEI VERFAHRBEWEGUNGEN DER MASCHINE NICHT ABGESICHERT, GEKNICKT ODER VERHEDDERT WIRD. DIE KABELLÄNGE MUSS AUSREICHEND SEIN, DASS DER KOMPLETTE VERFAHRBEREICH DER MASCHINE, OHNE ZUGBELASTUNG AUF DAS KABEL, ERREICHT WERDEN KANN.

PORTUGUÊS

Lista consolidada de avisos e cuidados

AVISOS

1. A INSTALAÇÃO DO SISTEMA DE LEITURA ÓPTICA RETROSCAN SÓ PODE SER EFETUADA POR PESSOAL TOTALMENTE QUALIFICADO QUE ESTÁ FAMILIARIZADO COM TODOS OS PROCEDIMENTOS E COM A LEGISLAÇÃO DE SEGURANÇA EM VIGOR NO PAÍS DE UTILIZAÇÃO.
2. A INSTALAÇÃO DO KIT DE ATUALIZAÇÃO RENSCAN PODE SER EFETUADA SOMENTE POR PESSOAL TOTALMENTE QUALIFICADO QUE ESTÁ FAMILIARIZADO COM TODOS OS PROCEDIMENTOS E COM A LEGISLAÇÃO DE SEGURANÇA EM VIGOR NO PAÍS DE UTILIZAÇÃO.
3. NÃO SE APROXIME DOS CIRCUITOS DA MÁQUINA-FERRAMENTA SEM TER PRIMEIRO DESLIGADO A ALIMENTAÇÃO ELÉCTRICA.

CUIDADOS

1. DESCARGAS ESTÁTICAS PODEM AVARIAR A PLACA CONTADORA. PORTANTO, RECOMENDA-SE O USO DE UMA PULSEIRA ANTI-ESTÁTICA, CONECTADA A UM PONTO DE LIGAÇÃO DE TERRA, QUANDO A PLACA FOR UTILIZADA. OS MOVIMENTOS, QUE PODEM GERAR ELECTRICIDADE ESTÁTICA, DEVEM SER MINIMIZADOS.
2. AS SEGUINTE INSTRUÇÕES SÃO DE NATUREZA GERAL. PARA INFORMAÇÕES/INSTRUÇÕES ESPECÍFICAS SOBRE A INSTALAÇÃO DA PLACA CONTADORA NO PERSONAL COMPUTER (PC) (COMPUTADOR PESSOAL), CONSULTAR O MANUAL DE REFERÊNCIA TÉCNICA DO USUÁRIO FORNECIDO COM SEU PC.
3. OBSERVAR AS PRECAUÇÕES CONTRA A ESTÁTICA DURANTE O TEMPO TODO. SE NÃO FOREM TOMADAS MEDIDAS DE PROTEÇÃO ADEQUADA CONTRA DESCARGA ESTÁTICA PODERÁ RESULTAR EM UMA AVARIA DA PLACA DE INTERFACE DA Sonda (CC1).

PORTUGUÊS

Lista consolidada de avisos e cuidados (continuação)

CUIDADOS

4. PARA EVITAR AVARIAS DA SONDA QUE PODEM-SE VERIFICAR QUANDO ELA VIAJA NO EIXO Z, É IMPORTANTE QUE QUANDO SELECIONA-SE UM PARAFUSO ALLEN OU UMA POSIÇÃO FIXA NA/CONTRA A QUAL O CONJUNTO DO PINO POSSA SER POSICIONADO, A POSIÇÃO SELECIONADA SE DESLOQUE NA DIREÇÃO Z COM A HASTE.
5. DESCARGAS ESTÁTICAS PODEM AVARIAR A PLACA CONTADORA. PORTANTO, RECOMENDA-SE O USO DE UMA PULSEIRA ANTI-ESTÁTICA, CONECTADA A UM PONTO DE LIGAÇÃO DE TERRA, QUANDO A PLACA FOR UTILIZADA. OS MOVIMENTOS, QUE PODEM GERAR ELECTRICIDADE ESTÁTICA, DEVEM SER MINIMIZADOS.
6. AS SEGUINTE INSTRUÇÕES SÃO DE NATUREZA GERAL. PARA INFORMAÇÕES/INSTRUÇÕES ESPECÍFICAS SOBRE A INSTALAÇÃO DA PLACA DE INTERFACE DA SONDA NO PERSONAL COMPUTER (PC) (COMPUTADOR PESSOAL), CONSULTAR O MANUAL DE REFERÊNCIA TÉCNICA DO USUÁRIO FORNECIDO COM SEU PC.
7. AO CONECTAR O CONJUNTO DO CABO DA SONDA DA SONDA SP2-1 AO PC, É IMPORTANTE QUE O CABO SEJA MANTIDO BEM AFASTADO DAS PEÇAS MÓVEIS PARA EVITAR COMPLICACÕES, DANOS, CORTES QUANDO A MÁQUINA-FERRAMENTA ESTIVER EM MOVIMENTO. É MUITO IMPORTANTE TAMBÉM QUE SEJA MANTIDO UM CERTO "JOGO" PARA PERMITIR QUE A MÁQUINA-FERRAMENTA SE DESLOQUE DENTRO DE SUA ÁREA DE OPERAÇÃO SEM PROVOCAR NENHUMA DEFORMAÇÃO DO CABO.

DANSK

Liste over advarsler og sikkerhedsregler

ADVARSLER

1. INSTALLATION AF RETROSCAN-SKANNESYSTEMET MÅ KUN FORETAGES AF UDDANNET PERSONALE, SOM ER FULDT FORTROLIGT MED SIKKERHEDSPROCEDURERNE OG BEKENDT MED GÆLDENDE LOVGIVNING I DET LAND, HVOR SYSTEMET ANVENDES.
2. INSTALLATION AF RENSCAN-OPGRADERINGSSÆTTET MÅ KUN FORETAGES AF UDDANNET PERSONALE, SOM ER FORTROLIGT MED ALLE SIKKERHEDSPROCEDURER OG BEKENDT MED LOVGIVNINGEN I DET LAND, HVOR SÆTTET ANVENDES.
3. FORSØG IKKE AT FÅ ADGANG TIL VÆRKTØJSMASKINENS STRØMKREDSLØB UDEN FØRST AT ISOLERE DENS STRØMFORSYNING.

SIKKERHEDSREGLER

1. INTERFACEKORTET KAN BLIVE BESKADIGET AF STATISK ELEKTRICITET. DERFOR ANBEFALES DET ALTID AT ANVENDE ET ANTISTATISK ARMBÅND MED EN PASSENDE JORDFORBINDELSE, NÅR KORTET BERØRES. BEVÆGELSER, SOM KAN GENERERE STATISK ELEKTRICITET, BØR OGSÅ HOLDES PÅ ET MINIMUM.
2. NEDENSTÅENDE INSTRUKTIONER ER GENERELLE. HVIS DER ØNSKES SPECIFIKKE OPLYSNINGER/INSTRUKTIONER OM, HVORDAN INTERFACEKORTET SKAL INSTALLERES I DEN PERSONLIGE COMPUTER (PC), KAN MAN SE I BRUGERVEJLEDNINGEN ELLER DEN TEKNISKE VEJLEDNING, SOM FULGTE MED PC'EN.
3. FØLG ALTID PROCEDURERNE FOR, HVORDAN MAN UNDGÅR STATISK ELEKTRICITET. FØLGES DE IKKE, KAN DET RESULTERE I BESKADIGELSE AF PROBENS INTERFACEKORT (CC1).

DANSK

Liste over advarsler og sikkerhedsregler (fortsat)

SIKKERHEDSREGLER

4. FOR AT UNDGÅ BESKADIGELSE AF PROBEN, NÅR DEN BEVÆGER SIG I Z-RETNINGEN, ER DET VIGTIGT AT SØRGE FOR, AT NÅR DER VÆLGES EN UNBRAKOSKRUE ELLER ET FAST STED, HVOR TAPSAMLINGEN KAN PLACERES, BEVÆGER DET VALGTE STED SIG I Z-RETNINGEN SAMMEN MED SPINDELEN.
5. PROBENS INTERFACEKORT KAN BLIVE BESKADIGET AF STATISK ELEKTRICITET. DERFOR ANBEFALES DET ALTID AT ANVENDE ET ANTISTATISK ARMBÅND MED EN PASSENDE JORDFORBINDELSE, NÅR KORTET BERØRES. BEVÆGELSER, SOM KAN GENERERE STATISK ELEKTRICITET, BØR OGSÅ HOLDES PÅ ET MINIMUM.
6. NEDENSTÅENDE INSTRUKTIONER ER GENERELLE. HVIS DER ØNSKES SPECIFIKKE OPLYSNINGER/INSTRUKTIONER OM, HVORDAN PROBENS INTERFACEKORT SKAL INSTALLERES I DEN PERSONLIGE COMPUTER (PC), KAN MAN SE I BRUGERVEJLEDNINGEN ELLER DEN TEKNISKE VEJLEDNING, SOM FULGTE MED PC'EN.
7. NÅR PROBEKABLET TRÆKKES FRA SP2-1-PROBEN TIL PC'EN, ER DET VIGTIGT, AT KABLET HOLDES PÅ FORSVARLIG AFSTAND AF BEVÆGELIGE DELE, SOM KABLET KAN HÆNGE FAST I, ELLER SOM KAN SKÆRE KABLET OVER, NÅR VÆRKTØJSMASKINEN ER I BEVÆGELSE. DET ER OGSÅ MEGET VIGTIGT, AT DER GIVES SÅ MEGET EKSTRA KABEL, AT VÆRKTØJSMASKINEN KAN BEVÆGE SIG I HELE SIT ARBEJDSOMRÅDE UDEN AT STRÆKKE KABLET.

SUOMI

Varoituksia ja muistutuksia

VAROITUKSIA

1. RETROSCAN -SKANNAUSJÄRJESTELMÄN ASENNUKSEN SUORITTAJANA ON OLTAVA TÄYSIN AMMATTIMAINEN HENKILÖSTÖ, JOKA TIETÄÄ TARKKAAN KAIKKI TURVALLISUUSTOIMET JA KYSEISESSÄ MAASSA VOIMASSA OLEVAT LAIT.
2. RENSCAN UPGRADE KIT -PÄIVITYSTARPEISTON ASENNUKSEN SUORITTAJANA ON OLTAVA TÄYSIN AMMATTIMAINEN HENKILÖSTÖ, JOKA TIETÄÄ TARKKAAN KAIKKI TURVALLISUUSTOIMET JA KYSEISEN MAAN VOIMASSA OLEVAT LAIT.
3. ÄLÄ YRITÄ PÄÄSYÄ KONEEN TYÖKALUN KYTKENTÖIHIN KATKAISEMATTÄ ENSIN SEN SÄHKÖVIRTAA.

MUISTUTUKSIA

1. STAATTINEN SÄHKÖ VAHINGOITTAA LASKINKORTTIA. SIKSI SUOSITELLAAN ANTISTAATTISEN SOPIVAAN MAADOITUSKOHTAAN KIINNITETYN RANNESITEEN KÄYTTÖÄ AINA KORTTIA KÄSITELTÄESSÄ. STAATTISTA SÄHKÖÄ KEHITTÄVÄT LIIKKEET ON MYÖS PIDETTÄVÄ MAHDOLLISIMMAN VÄHÄISINÄ.
2. SEURAAVAT OHJEET OVAT LUONTEELTAAN YLEISIÄ. KATSO PC:SI YHTEYDESSÄ TOIMITETTUA KÄYTTÖOPASTA/TEKNISTÄ KÄSIKIRJAA SAADAKSESI ERITYISIÄ TIETOJA/OHJEITA KOETTIMEN LIITÄNTÄKORTIN ASENNUKSESTA PC:HESI.
3. NOUDATA AINA STAATTISEN SÄHKÖN EHKÄISYÄ KOSKEVIA VAROTOIMIA. JOS STAATTISEN SÄHKÖN VAIKUTUKSEN EHKÄISY LAIMINLYÖDÄÄN, SE VOI AIHEUTTAA KOETTIMEN LIITÄNTÄKORTIN VAHINGOITTUMISEN.
4. KOETTIMEN VAHINGOITTUMISEN ESTÄMINEN LIIKUTTAESSA Z-AKSELILLA ON TÄRKEÄÄ VARMISTAMAAN, ETTÄ VALITTU PAIKOITUS KULKEE KARAN KANSSA SUUNTAAN Z KUN VALITAAN HYLSYN KANTARUUVI TAI KIINTEÄ PAIKOITUS, JOHON/JOTA VASTEN TAPPIASENNELMA VOIDAAN PAIKOITTA.

SUOMI

Varoituksia ja muistutuksia (jatkoa)

MUISTUTUKSIA

5. STAATTINEN SÄHKÖ VAHINGOITTAÄ KOETTIMEN LIITÄNTÄKORTTIA. SIKSI SUOSITELLAAN ANTISTAATTISEN SOPIVAAN MAADOITUSKOHTAAN KIINNITETYN RANNESITEEN KÄYTTÖÄ AINA KORTTIA KÄSITELTÄESSÄ. STAATTISTA SÄHKÖÄ KEHITTÄVÄT LIIKKEET ON MYÖS PIDETTÄVÄ MAHDOLLISIMMAN VÄHÄISINÄ.
6. SEURAAVAT OHJEET OVAT LUONTEELTAAN YLEISIÄ. KATSO PC:SI YHTEYDESSÄ TOIMITETTUA KÄYTTÖOPASTA/TEKNISTÄ KÄSIKIRJAA SAADAKSESI ERITYISIÄ TIETOJA/OHJEITA KOETTIMEN LIITÄNTÄKORTIN ASENNUKSESTA PC:HESI.
7. REITITETTÄESSÄ KOETINJOHDISTOA SP2-1-KOETTIMESTA PC:HEN ON TÄRKEÄÄ, ETTÄ JOHTO PIDETÄÄN ETÄÄLLÄ LIIKKUVISTA OSISTA, JOTKA VOIVAT KIERTYÄ TAI JUUTTUA SIIHEN TAI LEIKATA SEN POIKKI, KUN TYÖKALU ON LIIKKEESSÄ. ON MYÖS HYVIN TÄRKEÄÄ, ETTÄ JÄTEÄÄN RIITTÄVÄ MÄÄRÄ 'LÖYSÄÄ' MAHDOLLISTAMAAN KONEEN TYÖKALUN LIIKKUMINEN SEN TÄYSISSÄ PUITTEISSA AIHEUTTAMATTA JOHDON VENYTYSTÄ.

SVENSKA

Sammanställd förteckning över varningar och försiktighetsåtgärder

VARNINGAR

1. INSTALLATION AV SCANNINGSSYSTEMET RETROSCAN MÅSTE UTFÖRAS AV KVALIFICERAD PERSONAL SOM TILL FULLO KÄNNER TILL ALLA SÄKERHETSROUTINER OCH DEN GÄLLANDE LAGSTIFTNINGEN I LANDET DÄR SYSTEMET KOMMER ATT ANVÄNDAS.
2. INSTALLATION AV RENSANS UPPGRADERINGSSATS FÅR ENDAST UTFÖRAS AV KVALIFICERAD PERSONAL SOM TILL FULLO KÄNNER TILL ALLA SÄKERHETSROUTINER OCH DEN GÄLLANDE LAGSTIFTNINGEN I LANDET DÄR SYSTEMET KOMMER ATT ANVÄNDAS.
3. FÖRSÖK EJ ATT FÅ ÅTKOMST TILL MASKINENS KRETSAR UTAN ATT FÖRST BRYTA ELTILLFÖRSELN.

FÖRSIKTIGHETSÅTGÄRDER

1. RÄKNEKORTET KAN UTSÄTTAS FÖR SKADOR ORSAKADE AV STATISKA URLADDNINGAR. DET REKOMMENDERAS DÄRFÖR ATT ETT ANTISTATISKT ARMBAND ANVÄNDS, ANSLUTET TILL LÄMPLIG JORDNINGSPUNKT, NÄR KORTET HANTERAS. RÖRELSER SOM KAN ALSTRA STATISK ELEKTRICITET BÖR OCKSÅ HÅLLAS TILL ETT MINIMUM.
2. FÖLJANDE INSTRUKTIONER ÄR AV EN ALLMÄN NATUR. FÖR SÄRSKILD INFORMATION/INSTRUKTIONER HUR RÄKNEKORTET INSTALLERAS PÅ DIN PERSONDATOR, SE ANVÄNDARMANUALEN/DEN TEKNISKA HANDBOKEN SOM MEDFÖLJER DIN PC.
3. OBSERVERA FÖRSIKTIGHETSANVISNINGARNA OM ANTISTATISK ELEKTRICITET VID ALLA TIDPUNKTER. UNDERLÅTENHET ATT SKYDDA KORTET TILLRÄCKLIGT MOT STATISKA URLADDNINGAR KAN RESULTERA I SKADOR PÅ PROBE INTERFACE-KORTET (CC1).
4. FÖR ATT UNDVIKA ATT PROBEN SKADAS UNDER DESS RÖRELSE I Z-AXELN, ÄR DET VIKTIGT ATT TILLSE ATT DEN SEXKANTSSKRUV ELLER DEN FASTA PLATS I/MOT VILKEN STIFTSUPPSÄTTNINGEN LOKALISERAS RÖR SIG I Z-RIKTNINGEN TILLSAMMANS MED SPINDELN.

SVENSKA

Sammanställd förteckning över varningar och försiktighetsåtgärder (forts.)

FÖRSIKTIGHETSÅTGÄRDER

5. PROBE INTERFACE-KORTET KAN UTSÄTTAS FÖR SKADOR ORSAKADE AV STATISKA URLADDNINGAR. DET REKOMMENDERAS DÄRFÖR ATT ETT ANTISTATISKT ARMBAND ANVÄNDS, ANSLUTET TILL LÄMPLIG JORDNINGSPUNKT, NÄR KORTET HANTERAS. RÖRELSE SOM KAN ALSTRA STATISK ELEKTRICITET BÖR OCKSÅ HÅLLAS TILL ETT MINIMUM.
6. FÖLJANDE INSTRUKTIONER ÄR AV EN ALLMÄN NATUR. FÖR SÄRSKILD INFORMATION/INSTRUKTIONER HUR PROBE INTERFACE-KORTET INSTALLERAS PÅ DIN PERSONDATOR, SE ANVÄNDARMANUALENDEN TEKNISKA HANDBOKEN SOM MEDFÖLJER DIN PC.
7. NÄR PROBENS KABELUPPSÄTTNING DRAS FRÅN SP2-1 PROBEN TILL DIN PERSONDATOR ÄR DET NÖDVÄNDIGT ATT KABELN HÅLLS LÅNGT BORTA FRÅN RÖRLIGA DELAR SOM KAN HINDRA, TRASSLA IN, FÅNGA ELLER SKADA KABELN NÄR MASKINEN ÄR I RÖRELSE. DET ÄR OCKSÅ VIKTIGT ATT TILLRÄCKLIGT MED SPELRUM FINNS FÖR ATT TILLÅTA ATT MASKINEN KAN RÖRA SIG INOM HELA DRIFTSOMRÅDET UTAN ATT KABELN STRÄCKS.

中文

警告和谨慎一览表

警告

1. RETROSCAN扫描系统的安装必须由完全合格的、熟知使用国现行法规和安全规章制度的人员进行。
2. RENSCAN升级改进组件的安装必须由完全合格的、熟知使用国现行法规和安全规章制度的人员进行。
3. 在没有与电源隔绝之前，请不要试图接触机床的电路系统。

谨慎

1. 计数器接口卡易于被静电放电而损坏。因而，每当操作接口卡时，建议采用适当接地的防静电手腕带。运动也能产生静电，因而应将其减少到最小程度。
2. 以下说明属于一般性质的。有关如何正确地将计数器接口卡安装到您个人电脑(PC)里的专门信息和说明，请参阅随您个人电脑(PC)一起带来的使用手册和技术说明书。
3. 时时刻刻遵守防静电规程。如果预防静电放电措施不当将会损坏探头接口卡(CC1)
4. 为了预防探头在沿着Z轴方向运动时被损坏，应十分注意下面一点：当选择插件插座安装固定位置时，应确保所选位置与测量杆一起沿着Z轴方向运动。

中文警告和谨慎一览表（续）谨慎

5. 探头接口卡易于被静电放电而损坏。因而，每当操作接口卡时，建议采用适当接地的防静电手腕带。运动也能产生静电，因而应将其减少到最小程度。
6. 以下说明属于一般性质的。有关如何正确地将探头接口卡安装到您个人电脑(PC)里的专门信息和说明，请参阅随您个人电脑(PC)一起带来的使用手册和技术说明书。
7. 当铺设从SP2-1探头到您个人电脑(PC)之间探头连接电缆时，应特别注意保持电缆远离运动部件，因为机床操作过程中，这些运动部件可能会障碍、缠绕、夹咬或咬短电缆。非常重要的另外一点是使得电缆有足够的“活套”，确保机床在其整个工作范围动作时不会造成对电缆的拉扯。

始めに

警告と注意の総合的リスト

警告

1. レトロスキャン スキャンニング システムの取り付けは、その国に於て法律的に制定されている使用法で安全な手順に十分に精通している格所有の職員によって為されなければなりません。
2. レスキャン アップグレード キッドの取り付けは、その国に於いて法的に制定されている使用法で安全な手順に十分に精通している資格所の職員によって為されなければなりません。
3. 電源の切断の確認をする事なくしては、マシンツールのサーケットリを触ったりする事は決してしないようにして下さい。

注意

1. カウンターカードは静電気によって損傷されますから、カードを取り扱う時は、適切なアースポイントにつながれている反静電気のリストバンドを使用する事が推奨されています。そして、静電気を発生させる動きを最小限におさえる事が必要です。
2. これらの指示は、一般的な事項に関するものです。カウンターカードをあなたのパーソナル コンピューター（p c）に取り付けるための明確な情報や指示は、そのパーソナルコンピュータのユーザー／テクニカル参考手引きを参照して下さい。
3. システムの取り付けに際しては、静電気に対する警戒が常に必要です。静電気発生に対する適切な対処をしなければ、プローブ インターフェース カード（c c 1）の損傷の．結果となります。
4. プローブがZアクシスに動いている時に起こるダメージを避けるために重要な事は、ソケット キャップ スクリューの中に、あるいはフィクシド ロケーションに対して、ピン アセンブリーの位置を選択する時に、その選択された位置がスピンドルといっしょにZアクシスに動く事を確認する事です。

始めに

警告と注意の総合的リスト

注意

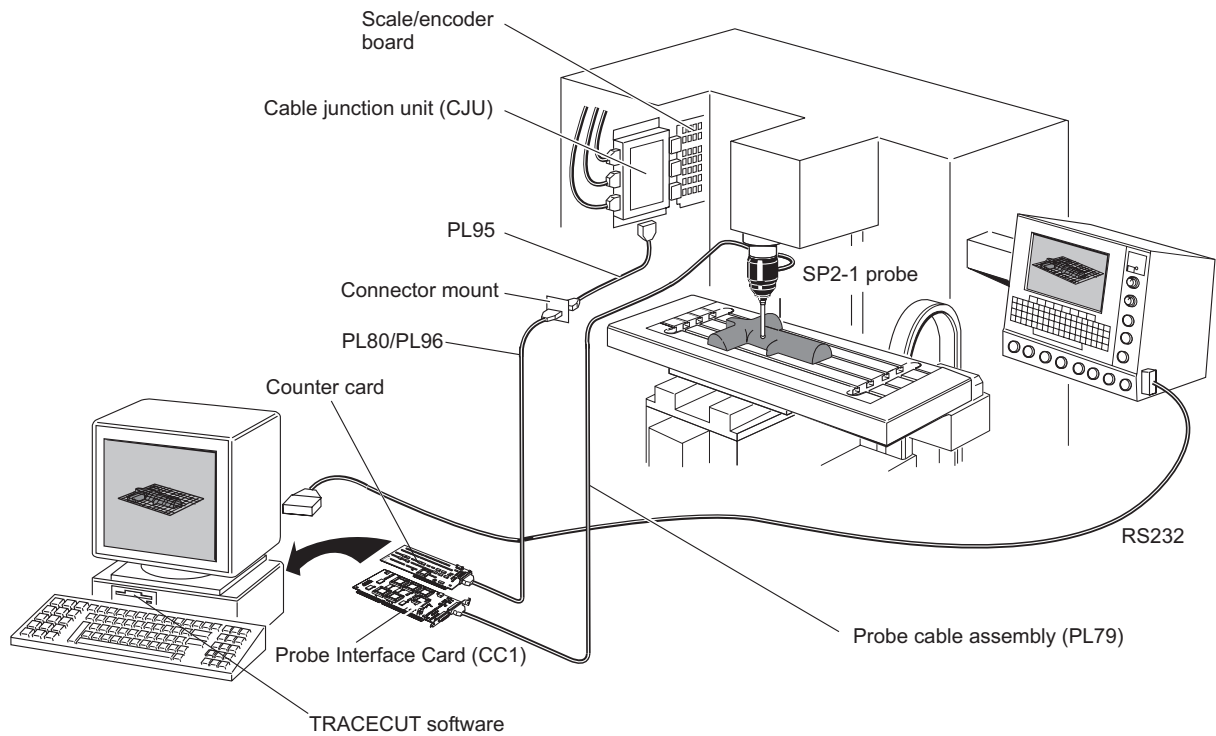
5. プローブ インターフェース カードは静電気によって損傷されますから、カードを取り扱う時は、適切なアースポイントにつながれている反静電気のリストバンドを使用する事が推奨されています。そして、静電気を発生させる動きを最小限におさえる事が必要です。
6. これらの指示は、一般的な事項に関するものです。プローブ インターフェース カードをあなたのパーソナル コンピューター（p c）に取り付けるための明確な 情報や指示は、そのパーソナルコンピューターのユーザー／テクニカル参考手引きを参照して下さい。
7. あなたの s p 2 - 1 プローブとパーソナルコンピューターをケーブルで接続する時、ケーブルは 活動している部分から十分に離れている事が必要です。活動している部分に引っ掛けたり、纏れたり、又、絡まったり、切断されたりする可能性があるからです。そして、もうひとつ重要なことは、マシンツールが完全に活動する為にケーブルが張り詰められたりする事のないように、そこに、十分な ” 緩み ” が提供されている事です。

Before you begin

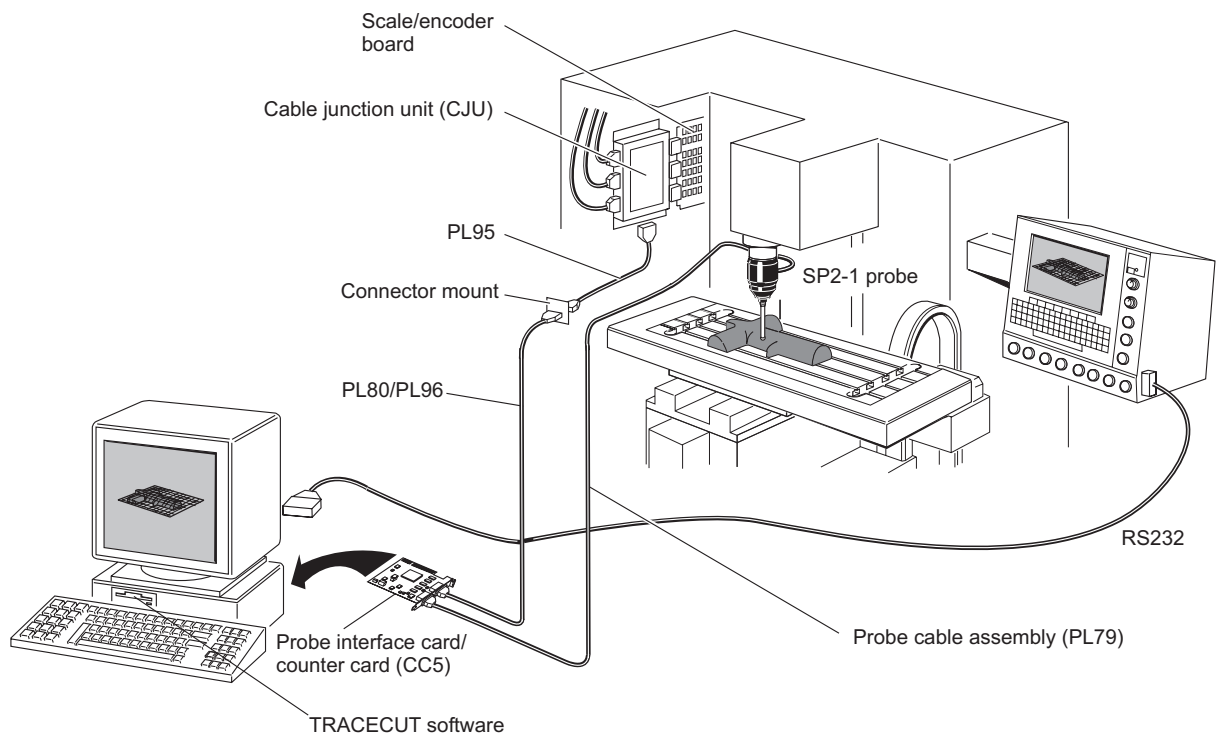
This RENSCAN 200 Scanning System Installation Guide contains detailed information about how to install the RENSCAN 200 scanning system to your machine tool (see Figure 1).

Split into three self-contained chapters, the guide is structured to provide you with an understanding of the RENSCAN 200 scanning system, as well as providing comprehensive installation instructions for each of its two modules - RETROSCAN and the RENSCAN 200 upgrade kit:

- ☐ **Chapter 1 - System description:** provides detailed information on the RENSCAN 200 scanning system and its individual parts.
- ☐ **Chapter 2 - System installation (RETROSCAN):** provides detailed instructions on how to install RETROSCAN to your machine tool.
- ☐ **Chapter 3 - System installation (RENSCAN 200 upgrade kit):** provides detailed instructions on how to install the RENSCAN 200 upgrade kit to your machine tool.



System supplied with separate counter card and probe interface card (CC1)



System supplied with combined probe interface and counter card (CC5)

Figure 1 - RENSCAN 200 scanning systems for machine tools

Support services

The Renishaw Group world-wide

Renishaw stands at the forefront of manufacturing technology. Its products give manufacturers world-wide the ability to machine components right first time with traceability.

Subsidiary companies in Australia, Brazil, France, Germany, Hong Kong, India, Indonesia, Italy, Japan, Peoples' Republic of China, Republic of Singapore, South Korea, Spain, Switzerland, The Netherlands and the United States of America are responsible for the sales, product support and customer service of the Group's products. Distributors have also been appointed in many other countries around the globe.

The Renishaw product support network

The Renishaw product support network offers you a wide range of choices as well as access to high-quality, responsive technical support staff. Also, because Renishaw recognises that support needs vary from user to user, the Renishaw product support network is structured in a way that allows you to choose the type of support that will best suit your needs.

Outside the United Kingdom, contact the product support department of the Renishaw Group company that best serves your area. For information about Renishaw's subsidiary operations, see **Product support world-wide**.

Product support world-wide

If you have a question about the RENSCAN 200 scanning system, first consult the documentation and other printed information included with your product.

If you cannot find a solution, you can receive information on how to obtain product support by contacting the Renishaw subsidiary company that best serves your country.

TRACECUT software support hotline

You can receive TRACECUT software support by telephoning the Renishaw TRACECUT software support hotline on:

+44 (0) 1453 523701

Alternatively, you may email us at: **digitising.products@renishaw.com**

Product support within the United Kingdom and Republic of Ireland

For product support services within the United Kingdom and Republic of Ireland, please contact the following;

Digitising Technical Support

Digitising Products Division

Renishaw plc

New Mills

Wotton-under-Edge

Gloucestershire

United Kingdom

GL12 8JR

Tel +44 (0) 1453 523701 email: digitising.products@renishaw.com

Calling a Renishaw subsidiary company

When you call, it will help the Renishaw support staff if you have the appropriate product documentation at hand. Please be prepared to give the following information (as applicable):

- The type of product that you are using.
- The type of hardware that you are using, including all serial numbers.
- The version of software that you are using.
- The machine tool and machine controller type.
- An account of what happened and what you were doing when the problem occurred.
- An account of how you tried to solve the problem.

Renishaw subsidiary companies

All Renishaw subsidiary companies offering customer support services and the countries they serve are listed in Table 1 - Renishaw companies around the world. If your country is not listed, please contact:

Digitising Technical Support

Digitising Products Division

Renishaw plc

New Mills

Wotton-under-Edge

Gloucestershire

United Kingdom

GL12 8JR

Tel +44 (0) 1453 523701 email: digitising.products@renishaw.com

TABLE 1 - RENISHAW SUBSIDIARY COMPANIES/OFFICES AROUND THE WORLD

Country	Contact the following Renishaw company
Australia	Renishaw Oceania Pty Ltd P.O. box 2420 North Brighton P.O. Victoria 3186 Australia Tel +61 3 9553 8267 Fax +61 3 9592 6738
Belgium	See France
Brazil	Renishaw Latino Americana Ltda Calçada dos Cristantemos 22 C.C. Alphaville, C.e.p. 06453-000 Barueri SP Brazil Tel +55 11 4195 2866 Fax +55 11 4195 1641
Canada	See United States and Canada
France	Renishaw S.A. 15 rue Albert Einstein Champs sur Marne 77437 Marne la Vallée Cedex 2 France Tel +33 1 64 61 84 84 Fax +33 1 64 61 65 26
Germany	Renishaw GmbH Karl-Benz Strasse 12 D-72124 Pliezhausen Germany Tel +49 7127 9810 Fax +49 7127 88237
Hong Kong	Renishaw (Hong Kong) Limited Unit 4A, 3/F New Bright Building 11 Sheung Yuet Road Kowloon Bay Hong Kong Tel +852 2753 0638 Fax +852 2756 8786
India	Renishaw Metrology Systems Private Limited #1101, 1102 Prestige Meridian 2 30 Mahatma Ghandi Road Bangalore 560 001 India Tel +91 80 5320 144 Fax +91 80 5320 140
Indonesia	Renishaw's Representative Office Jalan Permuda Jakarta 13220 Indonesia Tel +62 21 428 70153 Fax +62 21 424 3934
Italy	Renishaw S.p.A Via dei Prati 5 10044 Pianezza Torino Italy Tel +39 011 9 66 10 52 Fax +39 011 9 66 40 83

**TABLE 1 - RENISHAW SUBSIDIARY COMPANIES/OFFICES AROUND THE WORLD
(continued)**

Country	Contact the following Renishaw company
Japan	Renishaw KK Across City Nakano-Sakaue 38-1, Chuo 1-chome Nakano-ku Tokyo 164-0011 Japan Tel +81 3 5332 6021 Fax +81 3 5332 6025
Luxembourg	See France
The Netherlands	Renishaw International BV De Lind 21 4841 CK Prinsenbeck The Netherlands Tel +31 76 543 11 00 Fax +31 76 543 11 09
New Zealand	See Australia
The Peoples' Republic of China	Renishaw's Representative Office Room 2303 Silver Tower No. 2 Dong San Huan North Road Beijing 100027 The Peoples Republic of China Tel +86 10 6410 7993 Fax +86 10 6410 7992
Republic of Singapore	Renishaw's Representative Office 7 International Business Park #03-04 Transtech Building Singapore 609919 Republic of Singapore Tel +65 897 5466 Fax +65 897 5467
South Korea	Renishaw Liaison Office 135-190, 18/F, Kyoung Am Building 157-27, Samsung-Dong, Kangnam-Ku Seoul South Korea Tel +82 2 565 6878 Fax + 82 2 565 6879
Spain	Renishaw Iberica S.A. Edificio Oceano, Calle Garrotxa 10-12 Parque Mas Blau 08820 Prat de Llobregat Barcelona Spain Tel +34 3 478 21 31 Fax +34 3 478 16 08
Switzerland	Renishaw A.G. Poststrasse 5 CH8808 Pfäffikon Switzerland Tel +41 55 415 50 60 Fax +41 55 415 50 69
United States and Canada	Renishaw Inc. 5277 Trillium Blvd Hoffman Estates Illinois 60192 USA Tel +1 847 286 9953 Fax +1 847 286 9974

Welcome to Renishaw's RENSCAN 200 scanning system for machine tools

Welcome to RENSCAN 200, a high speed, closed loop retrofit scanning system for machine tools.

Integral to Renishaw's continuous commitment to technological innovation, the RENSCAN 200 scanning system has been specifically developed to:

- Provide a high speed, closed loop scanning capability for many of the world's machine tools.
- Provide additional capability to Renishaw's existing RETROSCAN scanning system.

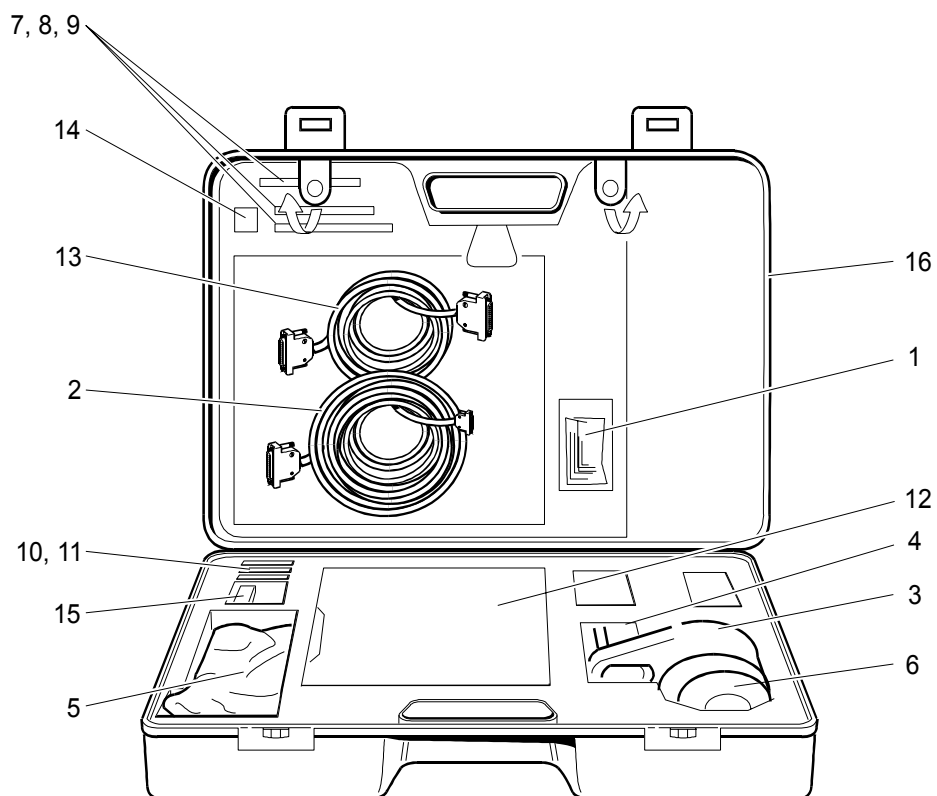
Available either as a stand alone system, or as an upgrade for present users of RETROSCAN, your RENSCAN 200 scanning system will typically comprise of the following:

- A Renishaw RETROSCAN scanning system.
- A Renishaw RENSCAN 200 upgrade kit

The RETROSCAN scanning system

Your RETROSCAN scanning system (see Figure 2), designed for easy installation and bringing the benefits of scanning to your machine tool, comes complete with its own carrying case [16] and includes the following:

- Tool kit [1].
- Probe cable assembly (PL79 or PL127) [2].
- Clutch assembly [3].
- Adapter assembly [4].
- Probe interface card (CC1 or CC5) [5].
- SP2-1 scanning probe [6].
- 5mm diameter ball end stylus [7].
- 6mm diameter ball end stylus [8].
- 8mm diameter ball end stylus [9].
- 3mm diameter hemispherical stylus [10].
- 6mm diameter hemispherical stylus [11].
- TRACECUT [12], calibration cube [14] and dongle [15].
- RS232C cable [13].



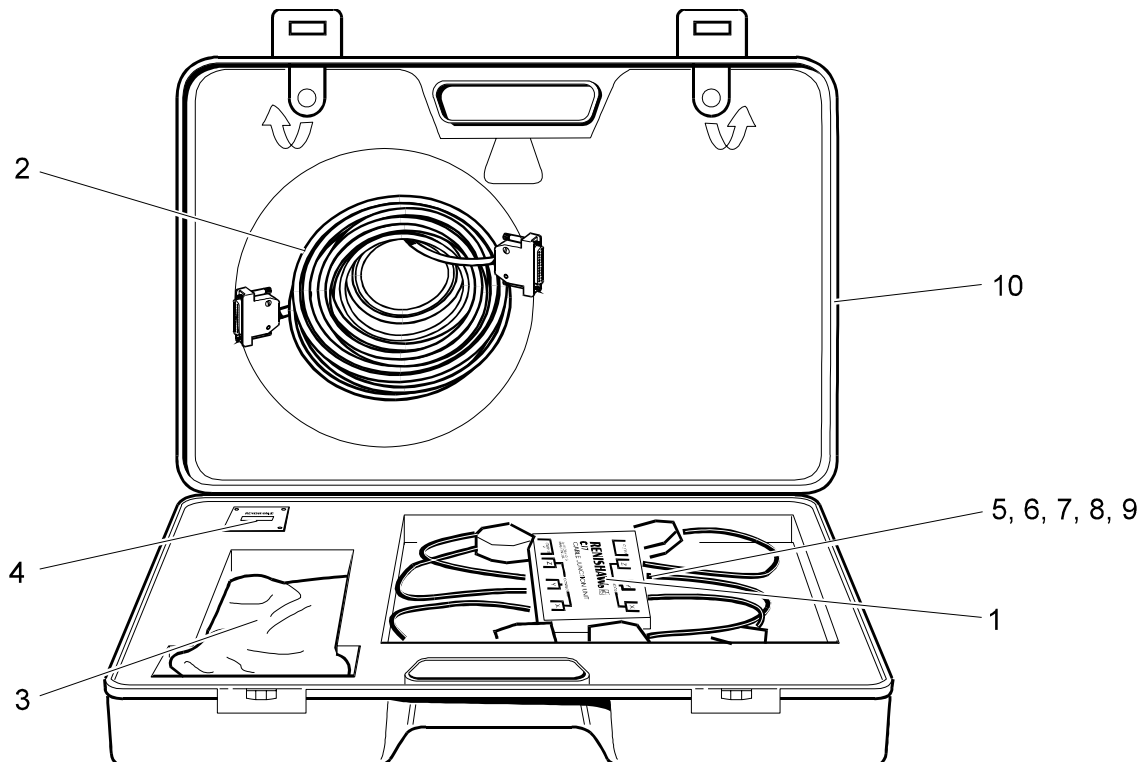
- | | |
|---|------------------------------|
| 1. Tool kit | 9. 8mm ball end stylus |
| 2. Probe cable assembly (PL79 or PL127) | 10. 3mm hemispherical stylus |
| 3. Clutch assembly | 11. 6mm hemispherical stylus |
| 4. Adapter assembly | 12. TRACECUT |
| 5. Probe interface card (CC1 or CC5) | 13. RS232C cable |
| 6. SP2-1 scanning probe | 14. Calibration cube |
| 7. 5mm ball end stylus | 15. Dongle |
| 8. 6mm ball end stylus | 16. Case |

Figure 2 - RETROSCAN scanning system (typical)

The RENSCAN 200 upgrade kit

Your RENSCAN 200 upgrade kit (see Figure 3), designed specifically to bring closed loop, high speed scanning to your machine tool, comes complete with its own carrying case [10] and includes the following:

- Cable junction unit [1] (this will be specific to your machine tool).
- RENSCAN output cable assembly (PL96) [2].
- Counter card [3] (this will be specific to your machine tool). **Please note that later versions of the RESCAN 200 upgrade kit do not include a counter card as a combined probe interface card and counter card (CC5) is now supplied with all new RETROSCAN scanning systems.**
- Connector mount [4].
- Four plastic cable ties [5].
- Eight 4mm self locking nuts [6].
- Eight 4mm zinc plated hexagon nuts [7].
- Four No.8x13 pan head screws [8].
- Eight M4x16 pan head screws [9].



1. Cable junction unit
2. RENSCAN output cable (PL96)
3. Counter card (**omitted from later versions**)
4. Connector mount
5. Cable ties

6. 4mm self locking nuts (8 Off)
7. 4mm hexagon nuts (8 Off)
8. No. 8x13 pan head screws (4 Off)
9. M4x16 pan head screws (8 Off)
10. Case

Figure 3 - RENSCAN 200 upgrade kit (typical)

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CHAPTER 1

System description

Reading this chapter will provide you with a detailed knowledge of the RENSCAN 200 high speed scanning system. It includes:

- A detailed description of each of your systems components.
- A detailed description of how each system component interacts.

Contained in this chapter

■ The RETROSCAN scanning system 1-2	■ The connector mount assembly 1-10
■ The SP2-1 scanning probe 1-4	■ The RENSCAN output cable assembly 1-10
■ The probe interface card (CC1 or CC5) 1-4	■ The counter card 1-11
■ TRACECUT 1-6	■ Technical data – RETROSCAN 1-12
■ The RENSCAN 200 upgrade kit 1-7	■ Technical data - RENSCAN upgrade kit 1-16
■ The cable junction unit 1-8	

Description of the RENSCAN 200 scanning system

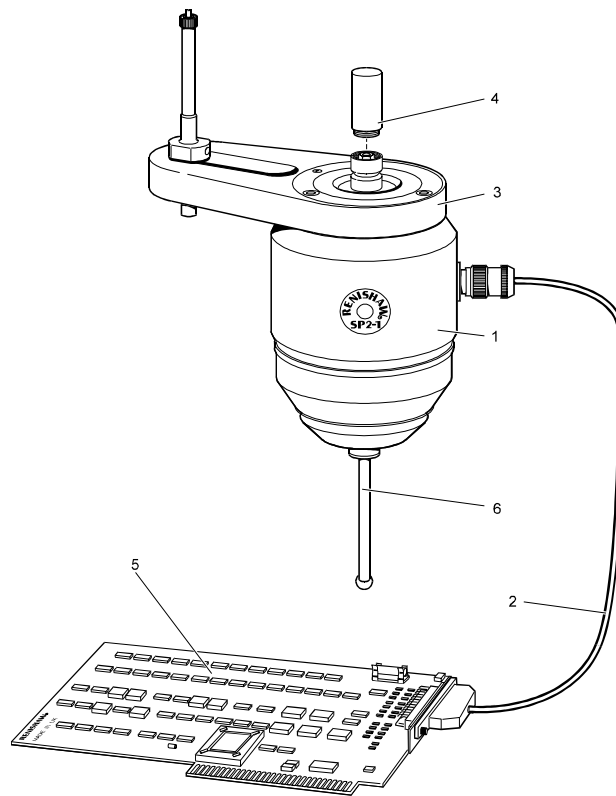
The RENSCAN 200 scanning system comprises two distinct modules:

- **The RETROSCAN scanning system:** which allows:
 - Two way communication between your computer and the machine tool's controller, via an RS232C communications link.
 - Data to be sent back to the computer, via the SP2-1 scanning probe and probe interface card (CC1 or CC5), to provide surface detail information.
- **The RENSCAN 200 upgrade kit:** which reads the machine tool's position by intercepting signals from its measuring encoders. This is achieved via a cable junction unit which routes these encoder signals to a counter card located within your computer. It is here where they are decoded, counted and routed to the TRACECUT software via a PC bus.

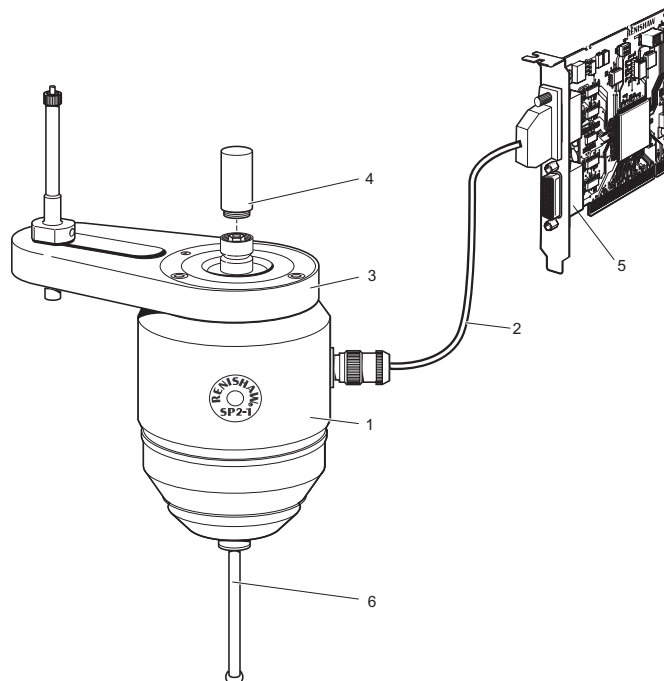
The RETROSCAN scanning system

The RETROSCAN scanning system contains the following primary components (see Figure 1.1):

- An SP2-1 scanning probe [1].
- A probe cable assembly (PL79 or PL127) [2].
- A clutch assembly [3].
- An adapter assembly [4].
- A probe interface card (CC1 or CC5) [5].
- TRACECUT.
- Range of Renishaw styli [6].



System incorporating CC1 type probe interface card



System incorporating CC5 type probe interface card

1. SP2-1 scanning probe
2. Probe cable assembly (PL79 or PL127)
3. Clutch assembly
4. Adapter assembly
5. Probe interface card (CC1 or CC5)
6. Stylus

Figure 1.1 - RETROSCAN scanning system (primary components)

The SP2-1 scanning probe

The SP2-1 (see Figures 1.1 and 1.2), is a second generation probe from Renishaw specifically designed for scanning. As well as using the latest in low-power electronics to provide excellent thermal performance, the SP2-1 also offers:

- Scanning speeds that are up to three times faster than conventional probes.
- High accuracy measurement to permit machine finishing of parts.
- Low scanning forces.
- A compact size to suit all machine types.
- Horizontal or vertical mounting in any orientation.
- A self-resetting stylus overtravel system.
- Easy stylus mounting.
- A user function switch, mounted to the probe, to allow customised signalling to the machine's control system.

Supplied with both a clutch assembly [3, Figure 1.1] and adapter assembly [4], the SP2-1 can be located in a fixed position whilst offering limited protection against accidental rotation of the machine tool spindle.

A probe cable assembly (PL79) [2] is provided to allow connection of the SP2-1 probe to a probe interface card (CC1 or CC5).

Further information on the SP2-1 scanning probe can be obtained by reading the SP2-1 Installation Guide (publication no. H-2000-5110) and SP2-1 User's Guide (publication no. H-2000-5115).

The probe interface card (CC1 and CC5)

The probe interface card (see Figure 1.3), provided for location within your computer, monitors signals sent by the SP2-1 probe and converts these to a form recognisable to the TRACECUT software.

In addition, the CC5 probe interface card will also act in the same manner as a counter card and will either decode 3 axes encoder systems or count 3 axes of quadrature incremental encoder signals. In all cases, signal format is provided by an RS422 balanced line system to ensure excellent immunity against electrical noise.

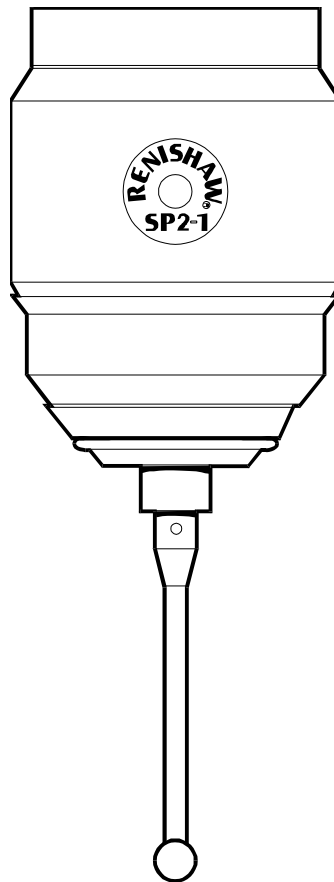
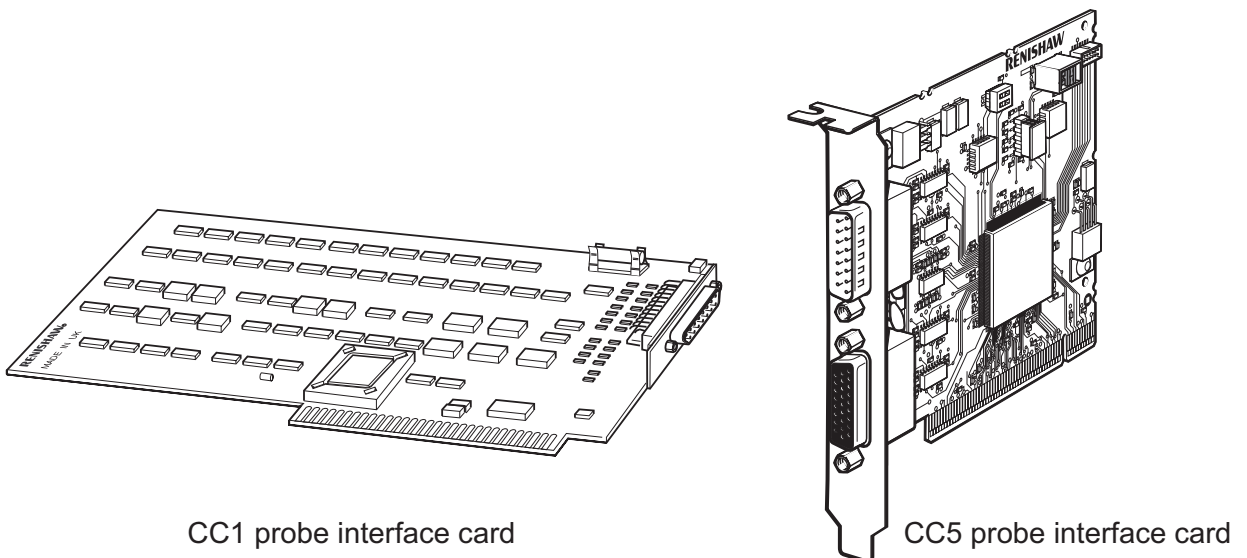


Figure 1.2 - The SP2-1 scanning probe



CC1 probe interface card

CC5 probe interface card

Figure 1.3 - The probe interface card

TRACECUT

TRACECUT is a standard PC based digitising software package for use in the mould and die industry. Where complex shapes have to be turned into moulds and dies from parts or prototypes, TRACECUT can be used to automate long-winded manual processes. The part is first digitised using a touch trigger probe, analogue scanning probe or laser scanning probe. This data can then be manipulated (inverted, scaled, mirrored, etc.). Following data manipulation, machine programs can be generated and sent to machine tools to cut moulds or dies. Data can also be sent to CAD systems for further manipulation.

TRACECUT offers the following benefits:

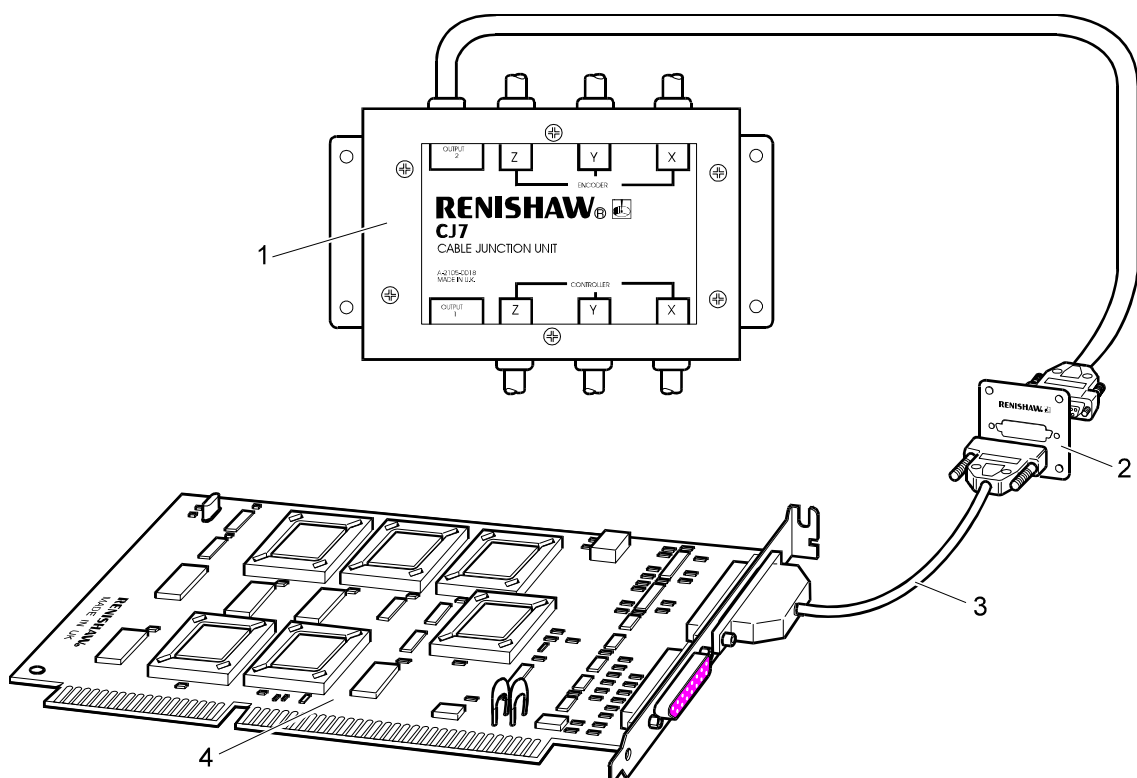
- The ability to capture, manipulate and machine both 2D profiles and 3D models adds capability to existing equipment for minimal outlay.
- The multitude of options for data capture allows almost any free form shape, no matter how detailed, to be modelled on a computer for later use.
- The 'windows' style format of the software makes it easy to use and highly flexible.
- Datuming facilities ensure accurate results time and again.
- The powerful manipulation and model combining features offer a wide capability for modification of part information.
- A wide range of machining features enables automatic generation of complex machining paths, removing hours of manual programming and finishing.
- Interfaces to CAD systems give the ability to further modify data and to add extra features to models.

Further information on TRACECUT can be obtained by reading the TRACECUT on-line help.

The RENSCAN upgrade kit

The RENSCAN upgrade package contains the following primary components (see Figure 1.4):

- A junction unit [1] (this will be specific to your machine tool type).
- A connector mount assembly [2].
- A RENSCAN output cable assembly [3] (PL96).
- A counter card [4] (this will be specific to your machine tool type).
Please note that later versions of the RENSCAN 200 upgrade kit do not include a counter card as a combined probe interface card and counter card (CC5) is now supplied with all new RETROSCAN scanning systems (please refer to 'The RETROSCAN scanning system' earlier in this chapter).



1. Cable junction unit
2. Connector mount assembly
3. RENSCAN output cable assembly
4. Counter card (omitted from later versions)

Figure 1.4 - RENSCAN upgrade kit (primary components)

The cable junction unit

Note...

As Renishaw manufactures a comprehensive range of cable junction units for use with specific machine tools, the cable junction unit supplied with your RENSCAN 200 upgrade kit will have been determined at the time of ordering. If several systems have been ordered for use with different machines, it is important to ensure that no attempt is made to install a cable junction unit onto a machine for which it is not designed.

The cable junction unit (see Figure 1.5) is essentially a 'T' junction that, when connected between the encoders and controller axis cards of your machine tool, intercepts the machine's positional feedback output signals. By effectively 'splitting' these signals in two, it allows identical sets of information to be sent both to the machine tool's controller and to the counter card or CC5 probe interface card supplied for location within your computer.

The cable junction unit incorporates six, twenty-two way screened cables labelled as follows; each cable, typically 250mm in length, will have been fitted with connectors suitable for your specific machine tool type:

- X ENCODER.
- Y ENCODER.
- Z ENCODER.

- X CONTROLLER.
- Y CONTROLLER.
- Z CONTROLLER.

Supplied with an integral output cable (PL95) (this will be connected to either OUTPUT 1 or OUTPUT 2 dependent on the card type to be used), the cable junction unit must be connected to the counter card via the RENSCAN output cable assembly (PL96). Where applicable, the output cable of the cable junction unit and the RENSCAN output cable assembly can be neatly connected together via the connector mount assembly specifically designed for mounting in one of your machine tool's panels.

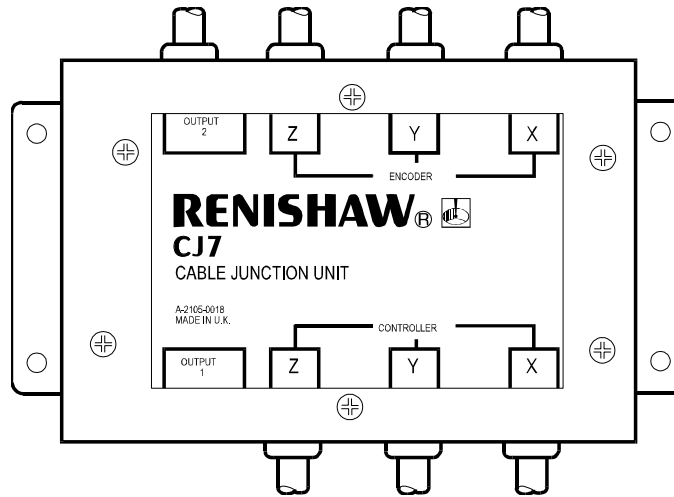


Figure 1.5 - The cable junction unit (typical)

The connector mount assembly

The connector mount assembly (see Figure 1.6) is supplied to enable connection of the cable junction unit output cable to the RENSCAN output cable via a bulkhead type connector which can be mounted in one of the machine tool's panels.

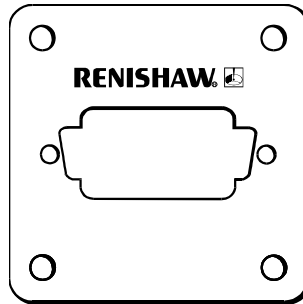


Figure 1.6 - The connector mount assembly

The RENSCAN output cable assembly

The RENSCAN output cable assembly (see Figure 1.7), used to connect the cable junction unit output cable to the counter card/CC5 probe interface card, is a multiple twisted pair type incorporating an overall screen to provide an excellent transmission line for each signal. The cable screen terminates at the counter card/CC5 probe interface card connector only.

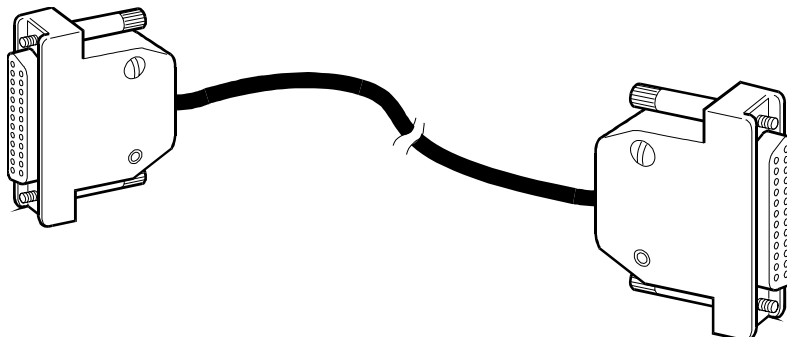


Figure 1.7 - The RENSCAN output cable assembly

The counter card

Note...

As Renishaw manufactures a comprehensive range of counter cards for use with specific machine tools, the counter card supplied with your RENSCAN 200 upgrade kit will have been determined at the time of ordering. If several systems have been ordered for use with different machines, it is important to ensure that no attempt is made to use a counter card for a machine tool for which it was not designed.

In addition to machine specific counter cards, Renishaw also manufactures a combined counter card and probe interface card (CC5). If your RENSCAN 200 upgrade kit includes this card, please refer to 'The probe interface card (CC1 and CC5)' earlier in this chapter.

The counter card (see Figure 1.8) (the type supplied will depend on your machine tool's specification), is a PC AT compatible ISA I/O card requiring a double connector slot within the computer to which it is to be installed.

Dependent on the type supplied, your counter card will either decode 3 axes encoder systems or count 3 axes of quadrature incremental encoder signals. In all cases, signal format is provided by an RS422 balanced line system to ensure excellent immunity against electrical noise.

Machine axis data/quadrature axis data is received via the 15 way D plug (PL1) mounted on the rear panel which is used to mount the counter card within the computer. The 15 way socket (SK2) is not currently used by the RENSCAN 200 scanning system.

The address select switch (SW1), mounted on top of the counter card to provide ease of selection when the counter card is installed in your computer, provides the following I/O address ranges:

200 hex
210 hex
300 hex
310 hex (default)

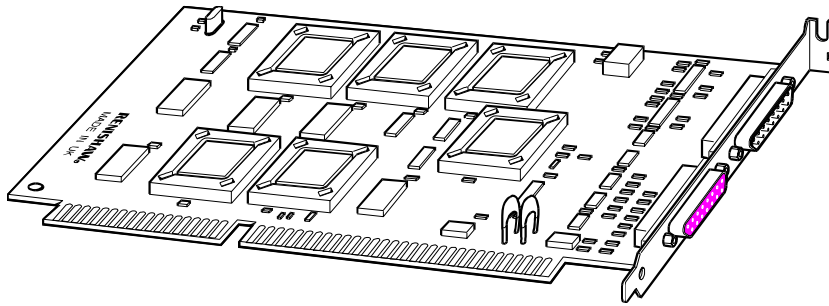


Figure 1.8 - The counter card (CC4 shown)

Technical data - RETROSCAN

SP2-1 scanning probe

Probe dimensions

The dimensions of the SP2-1 scanning probe are as shown in Figure 1.9 below.

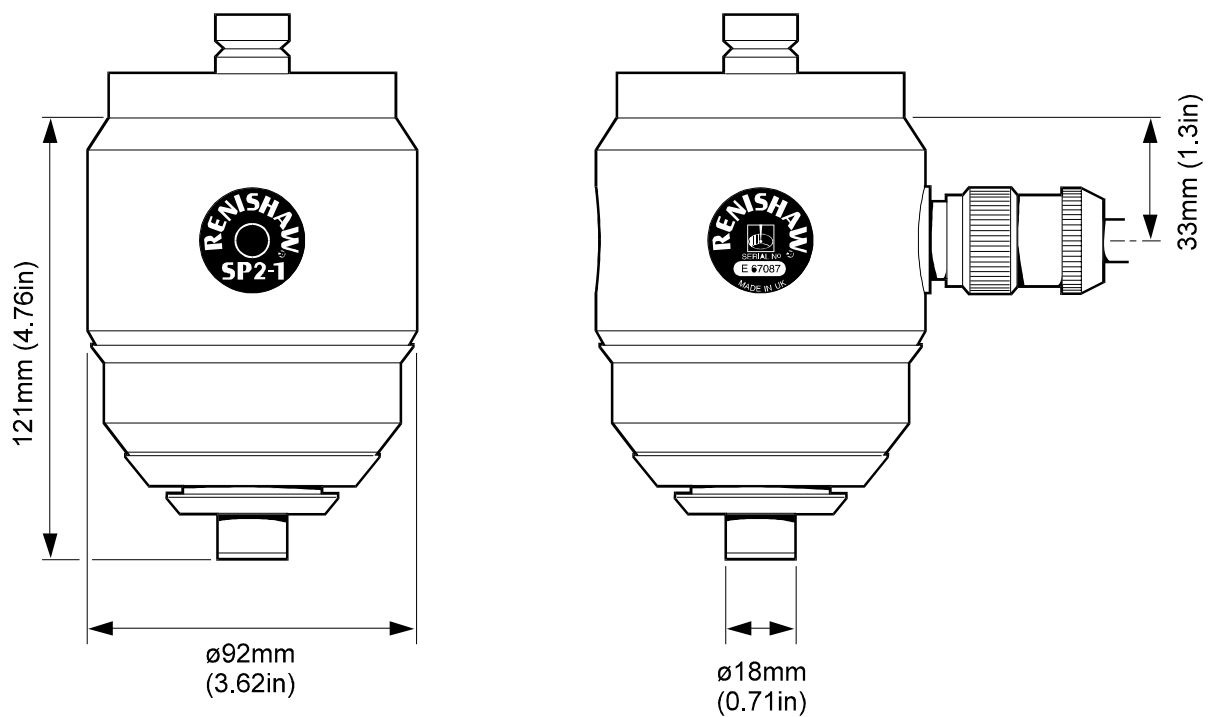


Figure 1.9 - SP2-1 scanning probe dimensions

SP2-1 scanning probe specification (continued)

Probe type:	3 axis measurement (X, Y and Z axes) Linear and parallel motion in all axes.
Measurement range:	$\pm 4.5\text{mm}$ (± 0.177 in.) in X, Y and Z axes mounted vertically.
Overtravel range:	18mm (0.709 in.) with 100mm (3.937 in.) stylus in X and Y axes, 5mm (0.197 in.) in Z axis.
Resolution:	1 μm (0.00004 in.) in X, Y and Z axes.
Linearity:	$\pm 2\mu\text{m}$ (0.00008 in.) (typical) over 2mm (0.079 in.) range in X, Y and Z axes.
Straightness:	$\pm 2\mu\text{m}$ (0.00008 in.) (typical) over 2mm (0.079 in.) range in X, Y and Z axes.
Spring rate:	3.5N/mm (20 lbf/in) in X, Y and Z axes $\pm 20\%$ with 100mm (3.937 in.) stylus.
Damping:	50% to 85% in X, Y and Z axes (typical) at 23°C (73.4°F).
Mounting:	$\varnothing 35\text{mm}$ (1.138 in.) or $\varnothing 50\text{mm}$ (1.969 in.) steel shank.
Weight:	Probe - 890g (31oz). Stylus - 50g to 80g (2oz to 3oz) typical.
Operating temperature:	+10°C to +40°C (+50°F to + 104°F).
Power supply:	Voltage - +12V Current - 150mA max
Outputs:	X, Y and Z axes: EIA-422-A phase quadrature, line drivers. User function switch: OCT Format, Contact rating 30V dc, 16mA max. Stylus overtravel: OCT Format, Contact rating 30V dc, 16mA max. Error: OCT Format, Contact rating 30V dc, 16mA max. Connector: 19 way size 14 - rear or side exit options, Orientation X.

SP2-1 scanning probe specification (continued)

Probe cable assembly (PL79)

Length: 5m (16.4 ft) maximum.

Probe output connector:

Connector type -	Bayonet locking conforming to MIL-C26482, Series 1 and manufactured to BS9522-F0017 and DEF STAN 59-35 Pattern 105.
Temperature range -	-55°C to +125°C
Number of keyways -	5
Number of pins -	19
Contact rating (fully loaded) -	5A @ 700V dc or ac peak
Mating cycles -	500
Contact resistance -	5mΩ max
Current rating -	7.5A per contact
Voltage rating -	1500 r.m.s. max at standard pressure

Counter card input connector:

Connector type -	25 way D type socket.
Mating cycles -	100
Contact resistance -	10mΩ
Current rating -	2A at 500V ac/dc

Probe cable assembly (PL127)

Length: 5m (16.4 ft) maximum.

Probe output connector:

Connector type -	Bayonet locking conforming to MIL-C26482, Series 1 and manufactured to BS9522-F0017 and DEF STAN 59-35 Pattern 105.
Temperature range -	-55°C to +125°C
Number of keyways -	5
Number of pins -	19
Contact rating (fully loaded) -	5A @ 700V dc or ac peak
Mating cycles -	500
Contact resistance -	5mΩ max
Current rating -	7.5A per contact
Voltage rating -	1500 r.m.s. max at standard pressure

Counter card/CC5 input connector:

Connector type -	26 way D type socket.
Mating cycles -	500
Contact resistance -	10mΩ
Current rating -	2A at 500V ac/dc

Technical data - RENSCAN upgrade kit

CJU output cable assembly (PL95)

Cable length: 1.5m (4.92ft)

Output connector:

Connector type -	25 way D type socket.
Mating cycles -	100
Contact resistance -	10m Ω
Current rating -	2A at 500V ac/dc
Insulation -	To UL94V-0

RENSCAN output cable assembly (PL96)

Cable type: Twisted pair shielded cable screened at computer end only to avoid earth loops

Cable length: 10m (32.8 ft) maximum.

CJU output cable mating
Connector:

Connector type -	25 way D type plug.
Mating cycles -	100
Contact resistance -	10m Ω
Current rating -	2A at 500V ac/dc
Insulation -	To UL94V-0

CC5/CC4/SC1 counter card input
connector:

Connector type -	15 way D type socket.
Mating cycles -	100
Contact resistance -	10m Ω
Current rating -	2A at 500V ac/dc
Insulation -	To UL94V-0

CHAPTER 2

System installation - RETROSCAN

This chapter provides you with detailed, step-by-step instructions on how to install the Renishaw RETROSCAN scanning system to your machine tool.

Contained in this chapter

- | | |
|---|---|
| ■ Installing the RETROSCAN scanning system to your machine tool and personal computer.....2-2 | ■ Preparation of the CC5 probe interface card . 2-11 |
| ■ Installing the SP2-1 scanning probe to your machine tool.....2-3 | ■ Connecting your SP2-1 probe to your probe interface card 2-14 |
| ■ Assembling the clutch assembly to the SP2-1 probe2-3 | ■ Connecting your PC to the machine tool's controller..... 2-17 |
| ■ Assembling the SP2-1 probe and attached clutch assembly to your machine tool.....2-8 | ■ Installing TRACECUT to your PC..... 2-19 |
| ■ Installing the probe interface card into your personal computer2-9 | ■ Assembling the TRACECUT dongle to your PC..... 2-19 |
| ■ Preparation of the CC1 probe interface card....2-9 | ■ Installing the TRACECUT software onto your PC..... 2-20 |
| | ■ Downloading TRACECUT 23a service pack 1 2-20 |
| | ■ Calibrating your RETROSCAN system..... 2-21 |

Installing the RETROSCAN scanning system on your machine tool and personal computer

WARNING

INSTALLATION OF THE RETROSCAN SCANNING SYSTEM MUST ONLY BE UNDERTAKEN BY FULLY QUALIFIED PERSONNEL WHO ARE FULLY CONVERSANT WITH ALL SAFETY PROCEDURES AND LEGISLATION IN FORCE IN THE COUNTRY OF USE.

CAUTION

OBSERVE ANTI-STATIC PRECAUTIONS AT ALL TIMES. FAILURE TO ADEQUATELY PROTECT AGAINST STATIC DISCHARGE CAN RESULT IN DAMAGE TO THE PROBE INTERFACE CARD (CC1)

Note...

Prior to beginning installation of the RETROSCAN scanning system to your machine tool, ensure that you have the following documentation. Where necessary, the SP2-1 Scanning Probe Installation Guide and User's Guide can be obtained through your nearest Renishaw company; refer to 'Before you begin' at the front of this publication for company names and addresses:

- Your computer manual.
- Your machine tool manufacturer's literature.
- Your SP2-1 Scanning Probe Installation Guide (publication No. H-2000-5110) and User's Guide (publication No. H-2000-5115).

Installing the SP2-1 scanning probe on your machine tool

Assembling the clutch assembly to the SP2-1 probe

Note...

The adapter assembly [1] is only required in instances where the probe is to be mounted to a shank incorporating a 20mm collet chuck.

Assemble the clutch assembly [4] and, where required, the adapter assembly [1] to your SP2-1 scanning probe [6] as follows (see Figure 2.1):

1. Remove the SP2-1 probe [6], the clutch assembly [4], and, where required, the adapter assembly [1] from the carrying case.
2. Remove the SP2-1 probe [6] from its packaging.

Note...

In some instances, the anodised ring [3] may be attached to the SP2-1 probe. If this is the case, remove the anodised ring from the probe by releasing the three M4 capscrews [2].

3. Remove the clutch assembly components from their packaging and, if applicable, remove any elastic bands or adhesive tape securing the anodised ring [3].
4. Remove the adapter assembly [1] from its packaging (if applicable).

Continued on Page 2-4

5. Assemble the pin assembly [9] to clutch assembly [4] as follows:

CAUTION

TO AVOID DAMAGE TO THE PROBE OCCURRING WHEN TRAVELLING IN THE Z AXIS IT IS IMPORTANT TO ENSURE THAT, WHEN SELECTING A SOCKET CAPSCREW OR FIXED LOCATION INTO/AGAINST WHICH THE PIN ASSEMBLY [9] CAN BE LOCATED, THE CHOSEN LOCATION WILL TRAVEL IN THE Z DIRECTION WITH THE SPINDLE.

Notes...

The pin assembly is supplied with two different location pins [11] with turned diameters at each end. Each diameter is of a different size, either 4mm, 5mm, 6mm or 8mm, to allow for location within four different sizes of socket capscrew.

If the machine tool does not have a suitable socket capscrew into which either of the location pins [11] can locate, the pin assembly may be positioned against a fixed location on the machine tool. In instances where there is no available location, or where an automatic tool changer is to be used, refer to your nearest Renishaw company for assistance. See the 'Before you begin' section at the front of this publication for company names and addresses:

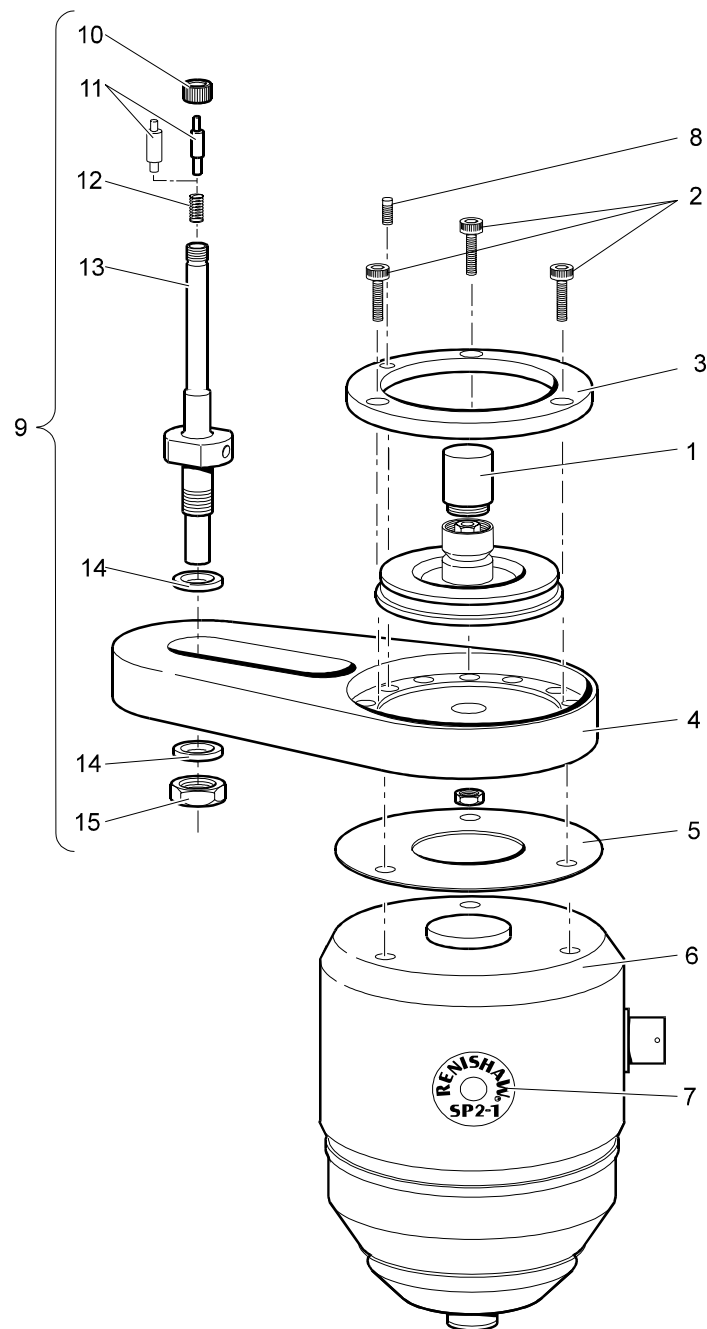
- A. Check to see if the machine tool has a suitable M4, M5, M6 or M8 socket capscrew into which either of the locating pins [11] can be located.

Note...

The pin assembly [9] is supplied with the 4mm/5mm location pin installed. If you need to substitute this for the 6mm/8mm location pin, or if you need to turn the existing location pin around, take care that the spring [12] does not fall out of the tube holder [13].

- B. If a suitable socket capscrew is found, assemble the applicable location pin [11] into the tube holder [13] ensuring the required diameter is uppermost. Secure location pin within tube holder with the screwed cap [10].

Continued on Page 2-6



1. Adapter assembly
2. 4mm socket capscrow (3 Off)
3. Anodised ring
4. Clutch assembly
5. Insulation washer
6. SP2-1 probe
7. 'RENISHAW SP2-1' label
8. Plastic grubscrow

9. Location pin assembly
10. Screwed cap
11. Location pins
12. Spring
13. Tube holder
14. Plastic washer (2 Off)
15. 12mm hexagon nut

Figure 2.1 - Assembling the clutch assembly to the SP2-1 probe

- C. Assemble one of the two M12 black plastic washers [14] to the tube holder [13].
 - D. Insert the second black plastic washer [14] and the M12 nut [15] into the slot within the arm of the clutch assembly [4].
 - E. Insert the tube holder [13] through the slot within the arm of the clutch assembly [4] to locate the 12mm hexagon nut [15]. Lightly tighten tube holder into hexagon nut.
6. Mount the clutch assembly [4] to the SP2-1 probe [6] as follows:

Notes...

Prior to final assembly of the clutch assembly [4] to the SP2-1 probe [6], it is important to ensure that the orientation of the clutch assembly, relative to the probe, is correct. This is essential if the orientation of the X, Y axes of the probe are to be correctly aligned to those of your machine tool.

If the clutch assembly [4] is to be mounted to a shank incorporating a 20mm collet type chuck, the adapter assembly [1] must be used.

- A. Where necessary, screw the adapter assembly [1] into the shank mounting plate of the clutch assembly [4].
- B. Assemble anodised ring [3] into recess of clutch assembly [4].
- C. Assemble a shank to the shank mounting plate of the clutch assembly [4]/adapter assembly [1] as applicable.
- D. Insert the shank into the spindle of your machine tool ensuring that the location pin assembly [9] is located either:
 - Within the designated socket capscrew on the machine tool *or*
 - Firmly against the designated fixed location on the machine tool.
- E. Apply a piece of masking tape to the side of the clutch assembly [4] such that it is directly facing you when looking towards the front of the machine tool. Using a pencil, mark a vertical line down the entire height of the masking tape.

- F. Position a second piece of masking tape on the SP2-1 probe [6] directly above the 'RENISHAW SP1-2' label [7].
- G. Looking at the front of the machine tool, position the SP2-1 probe [6] up against the clutch assembly [4] such that the 'RENISHAW SP2-1' label [7] is directly facing you and the probe's X,Y axes are visually aligned to those of the machine. Maintaining the probe in this exact position, mark a vertical line on the masking tape attached to the probe such that it is directly adjacent that previously marked on the masking tape attached to the clutch assembly.
- H. Withdraw the SP2-1 probe [6] from the clutch assembly [4].
- I. Remove shank/clutch assembly [4] from the machine tool.
- J. Remove shank from clutch assembly [4].
- K. Remove anodised ring [3] from clutch assembly [4].
- L. With the SP2-1 probe [6] held vertically, place the insulation washer [5] on top face of probe and align holes.
- M. Assemble the clutch assembly [4] to the top face of the SP2-1 probe [6] ensuring that the two lines you have marked exactly align.
- N. Maintaining the alignment between the clutch assembly [4] and the SP2-1 probe as closely as possible, assemble the anodised ring [3] into the recess within the clutch assembly. Ensure that the 5mm grubscrew housed within the flange of the anodised ring locates within the location bore provided within the top face of the SP2-1 probe [6].
- O. Secure the clutch assembly [4] to the SP2-1 probe [6] with the three M4 capscrews [2]. Torque capscrews to 2.6 Nm.
- P. Remove masking tape from the SP2-1 Probe [6] and clutch assembly [4].

Assembling the SP2-1 probe and attached clutch assembly to your machine tool

Assemble the SP2-1 probe and attached clutch assembly to your machine tool as follows (refer to Figure 2.1):

1. Where applicable, tighten the adapter assembly [1] to 2Nm.
2. Assemble shank to the clutch assembly's probe mounting plate/adapter assembly [1] as applicable.
3. If applicable, tighten grubscrews within shank to 6-8Nm.
4. If applicable, fully tighten shank collett onto adapter assembly [1].
5. Assemble shank into spindle of machine tool ensuring that:
 - The SP2-1 probe is correctly orientated (The 'RENISHAW SP2-1' label [7] must be facing you when looking towards the front of the machine tool).
 - The pin assembly [9] is correctly located either within the designated socket capscrew, or against the designated fixed surface.
6. With the pin assembly [9] located as required, tighten the tube assembly [13] against the 12mm hexagon nut [15] to lock the pin assembly in position.

Installing the probe interface card in your personal computer

CAUTIONS...

THE PROBE INTERFACE CARD IS SUBJECT TO DAMAGE BY STATIC DISCHARGE. IT IS THEREFORE RECOMMENDED THAT THE USE OF AN ANTI-STATIC WRISTBAND, CONNECTED TO A SUITABLE EARTH POINT, IS EMPLOYED WHENEVER THE CARD IS HANDLED.

MOVEMENT, WHICH CAN GENERATE STATIC ELECTRICITY, SHOULD ALSO BE KEPT TO A MINIMUM.

THE FOLLOWING INSTRUCTIONS ARE OF A GENERAL NATURE. FOR SPECIFIC INFORMATION/INSTRUCTIONS ON HOW THE PROBE INTERFACE CARD MUST BE INSTALLED INTO YOUR PERSONAL COMPUTER (PC), REFER TO THE USER/TECHNICAL REFERENCE MANUAL SUPPLIED WITH YOUR PC.

Preparation of the CC1 probe interface card

Note...

If the base address setting of the probe interface card is changed, it is important to ensure that, following installation of your TRACECUT software, the base address setting in TRACECUT is also changed. This can be achieved by accessing the RETROSCAN specific parameters within the Utilities section of the TRACECUT software and entering the correct address. Refer to your TRACECUT on-line help for instructions on how to perform this task.

The probe interface card (see Figure 2.2) is supplied pre-set to I/O base address 300 hex. Whilst this setting should be correct for most installations, if this base address is already being used by another card within your PC (or your PC has difficulty in accessing the card), the base address may be changed to one of the following:

- 200 hex
- 210 hex
- 310 hex

To change the I/O base address of the probe interface card, carry out the following (see Figure 2.2):

1. Remove the probe interface card [1] from the carrying case.
2. Remove the probe interface card [1] from its protective wrapping.
3. Alter switch SW1 [2] to the required setting in accordance with Figure 2.2.

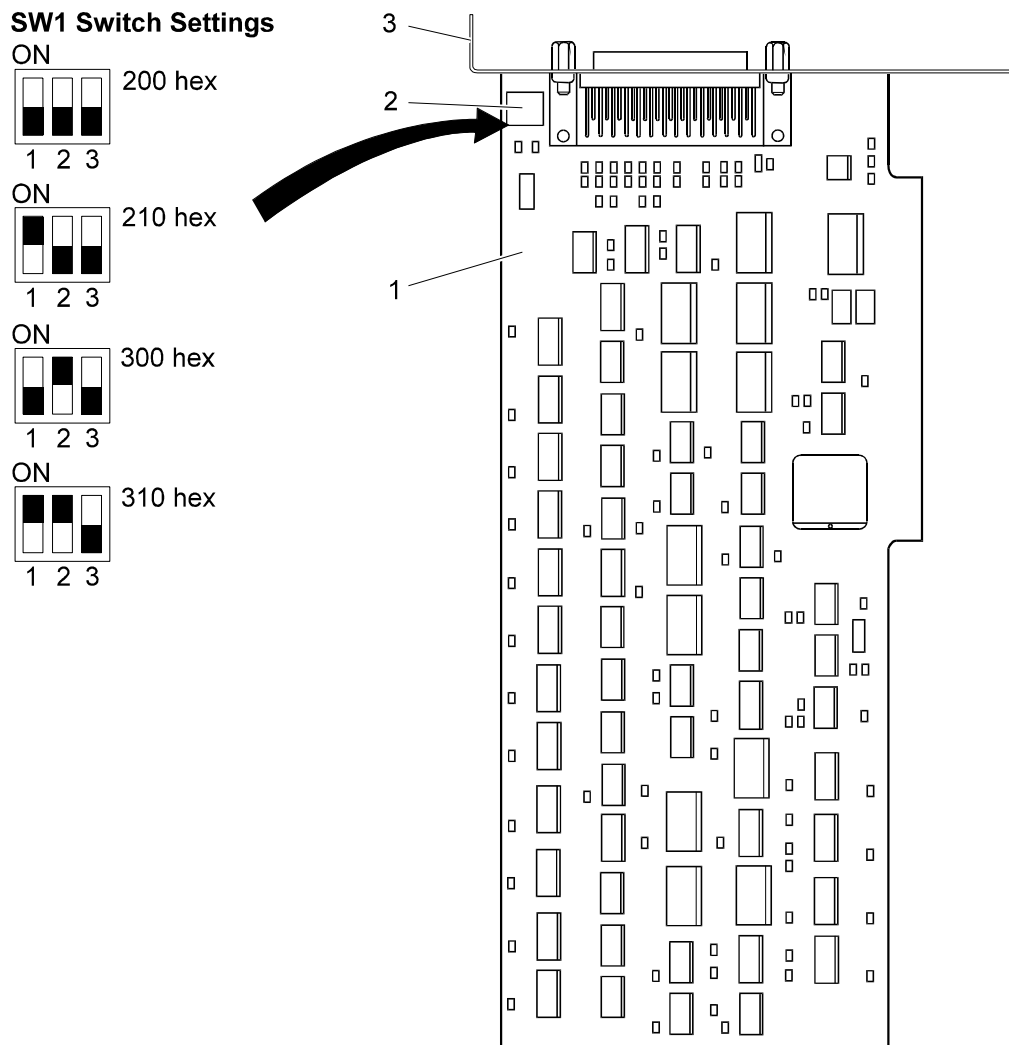


Figure 2.2 - Probe interface card (CC1) switch settings

Preparation of the CC5 probe interface card

Prior to installing the CC5 probe interface card into your PC, it is important to ensure all switch settings are correct for your specific application as follows (see Figure 2.3):

Note...

If the setting of the switch marked SC3/ CC4 [1] on the probe interface card is changed, this change will not take effect until the PC (into which the card has been installed) is next powered up.

1. Examine the slider of the switch marked CC4/SC3 [1] and, if required, position to select the mode in which you wish the card to operate.

Note...

If the setting of the switch marked F/M [2] on the probe interface card is changed, this change will take immediate effect.

2. If you have selected SC3 mode at step 1, examine the position of the upper switch setting of the switch marked F/M [2] and, if required, position to select the mode in which you wish the card to operate. Selecting the 'F' setting will cause the card to decode Fanuc serial data. Selecting the 'M' setting will cause the card to decode Mitsubishi serial data.

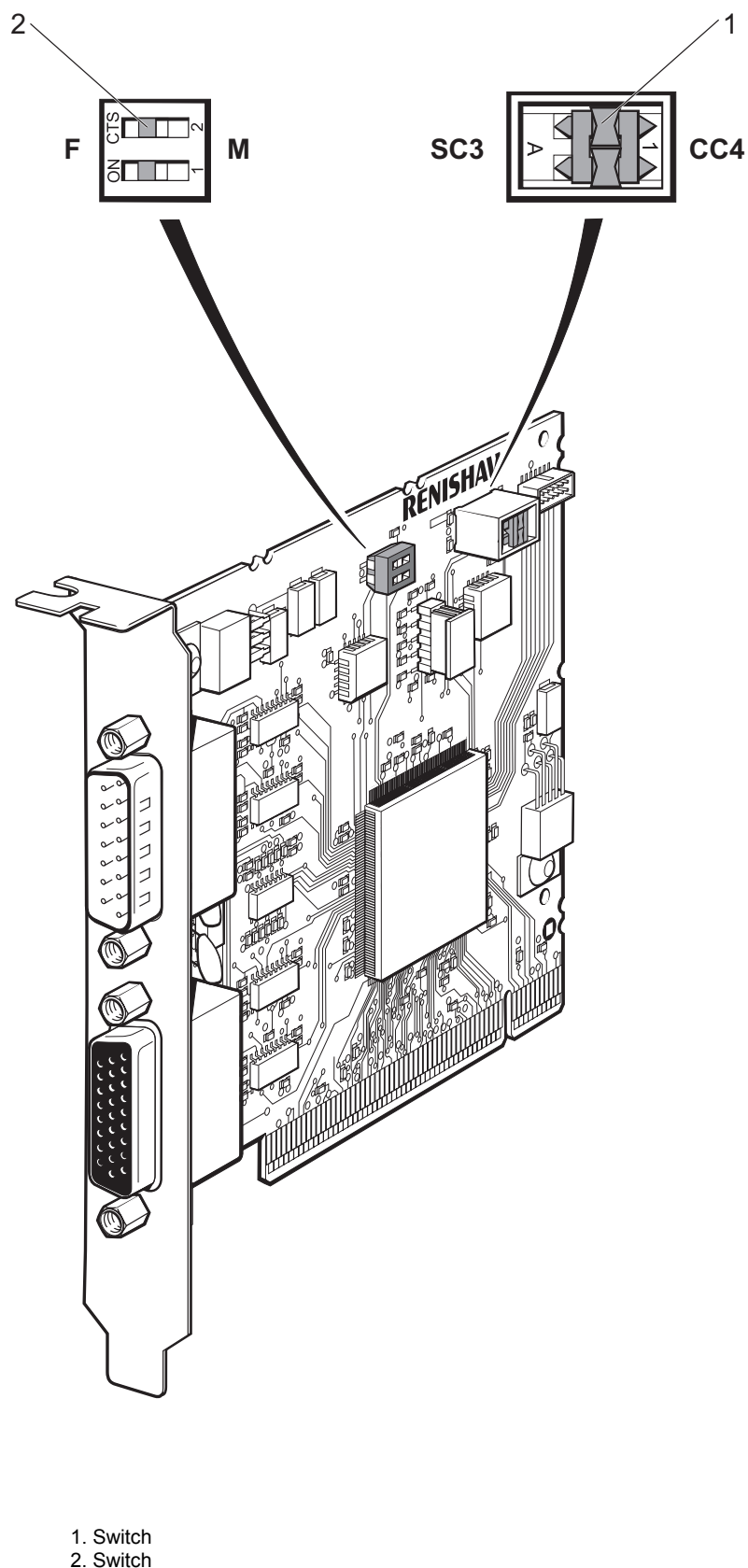


Figure 2.3 - Probe interface card (CC5) switch settings

Installation of the probe interface card

To install the probe interface card in your PC, carry out the following:

Note...

The following instructions are for guidance only. Consult the User Manual or Technical Reference Manual supplied with your PC for specific instructions/safety information.

1. Disconnect the power supply to your PC.
2. Remove the external covers of the PC in accordance the manufacturer's instructions.
- 3a. If installing a CC1 probe interface card, locate a vacant 8 or 16 bit bus slot into which the probe interface card can be fitted.
- 3b. If installing a CC5 probe interface card, locate a vacant PCI slot into which the probe interface can be fitted.
4. Observing anti-static precautions, carefully slot the probe interface card [1] into place (following all manufacturer's instructions). Ensure that no part of the probe interface card is in contact with other expansion cards within your PC.
5. Screw the mounting bracket of the probe interface card to the back panel rail of your PC.
6. Make a final check of the installation.
7. Replace the external covers of the PC.
8. Reconnect the power supply to your PC.

Connecting your SP2-1 probe to your probe interface card

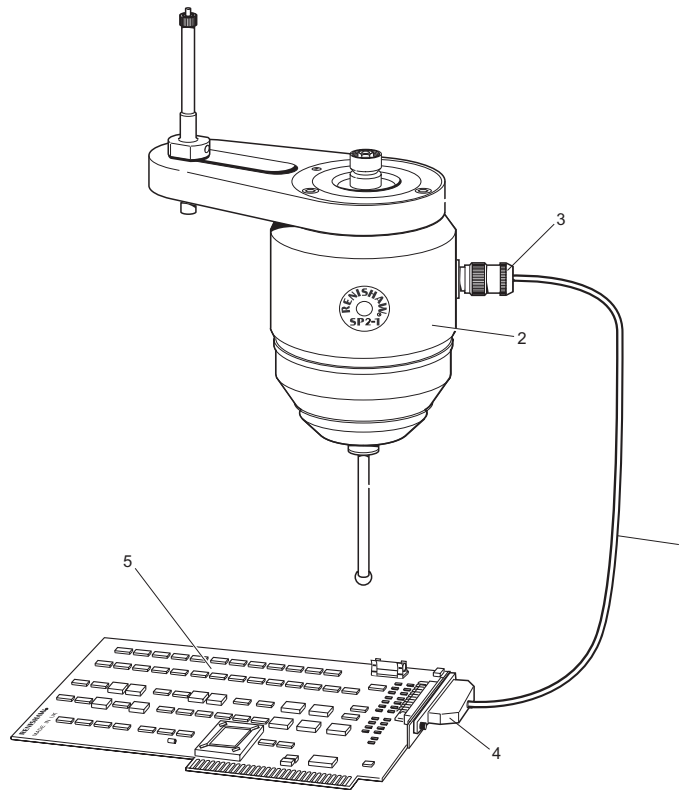
Note...

Connection of the SP2-1 probe to the probe interface card is achieved via the probe cable assembly (PL79 or PL127) supplied as part of your RETROSCAN kit. If the probe cable assembly is too short for your specific machine tool, extension cables may be obtained through your nearest Renishaw company. Refer to 'Before you begin' at the front of this publication for company names and addresses.

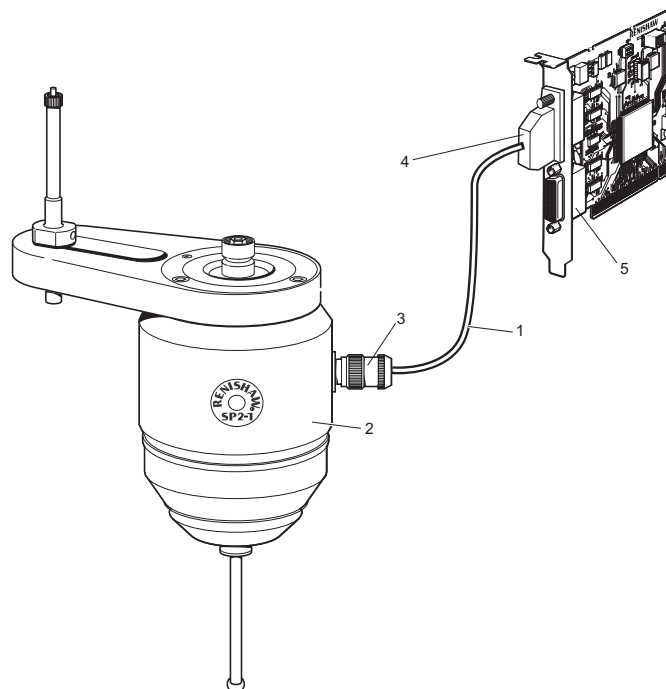
To connect your SP2-1 probe to your probe interface card, carry out the following (see Figure 2.4):

1. Remove the probe cable assembly (marked as PL79 or PL127) [1] from carrying case.
2. Remove probe cable assembly [1] from packaging.
3. If required, move your PC to its required location adjacent the machine tool.
4. Where applicable, operate your machine tool to position the SP2-1 probe [2] at the furthest possible distance (within the machine tool's operating envelope) from your PC.
5. Connect the bayonet locking connector [3] of the probe cable assembly [1] to the connector on your SP2-1 probe [2] and fully lock into position.

Continued on Page 2-14



System incorporating CC1 type probe interface card



System incorporating CC5 type probe interface card

1. Probe cable assembly (PL79 or PL127)
2. SP2-1 probe
3. Bayonet locking connector
4. D type socket
5. Probe interface card (CC1 or CC5)

Figure 2.4 - Connecting the SP2-1 probe to the probe interface card

CAUTION

WHEN ROUTING THE PROBE CABLE ASSEMBLY FROM YOUR SP2-1 PROBE TO YOUR PC, IT IS ESSENTIAL THAT THE CABLE IS KEPT WELL AWAY FROM MOVING PARTS WHICH MAY SNAG, ENTANGLE, TRAP OR SEVER IT WHEN THE MACHINE TOOL IS IN MOTION. IT IS ALSO VERY IMPORTANT THAT SUFFICIENT 'SLACK' IS PROVIDED TO ALLOW THE MACHINE TOOL TO MOVE WITHIN ITS ENTIRE OPERATING ENVELOPE WITHOUT CAUSING ANY STRAINING OF THE CABLE.

6. Route the probe cable assembly [1] to the rear of your PC as required, and observing the above Caution.
7. Connect the D type socket [4] of the probe cable assembly [2] to the rear of the probe interface card [5] and tighten into position.

Connecting your PC to the machine tool's controller

To connect your computer to your machine tool's controller, carry out the following (see Figure 2.5):

1. Remove the RS232C cable [1] and 9 to 25 pin adapter [2] from the RETROSCAN carrying case and remove all wrapping.
2. Identify the type of serial port on your PC.

Note...

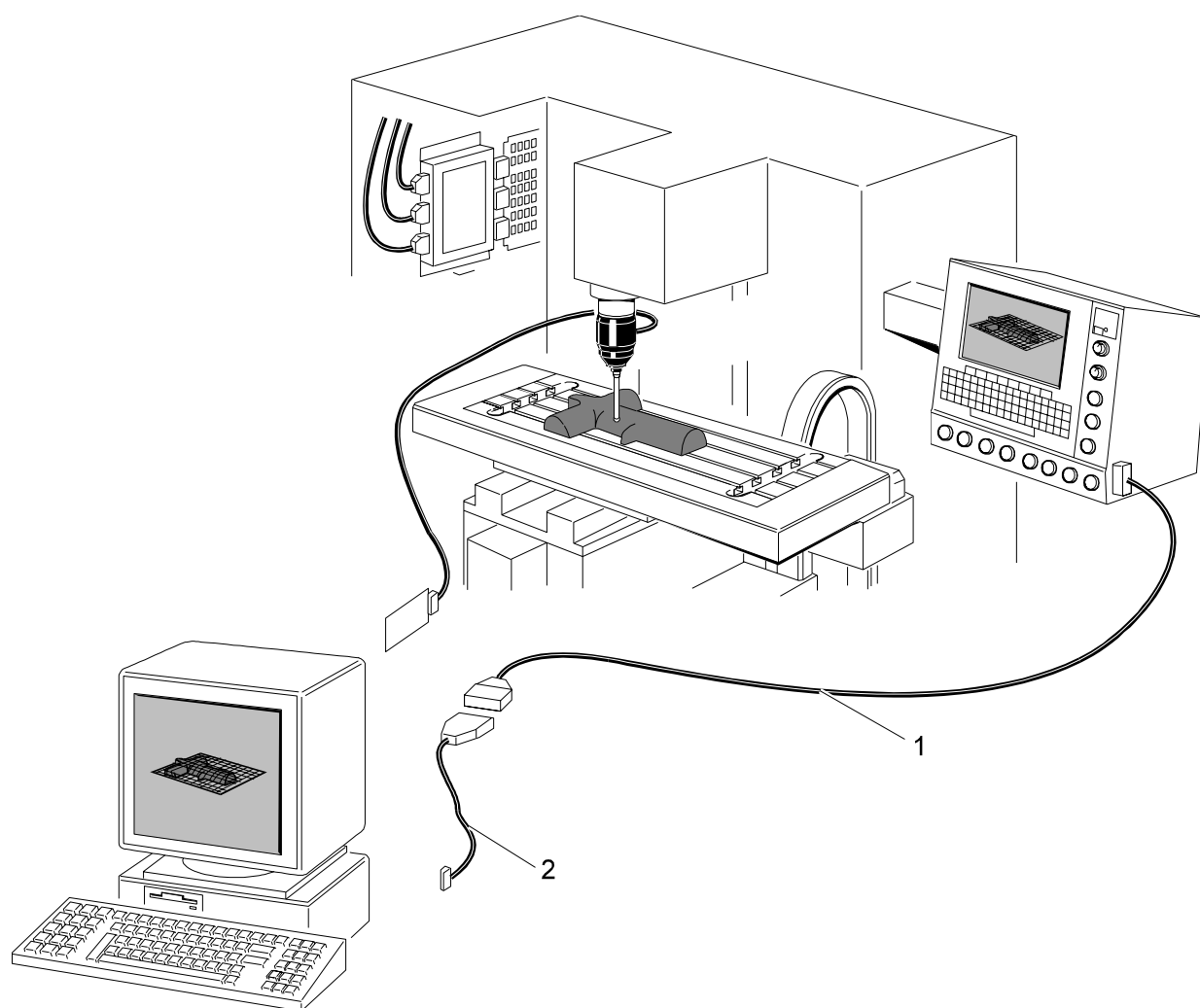
If the serial port on your PC is 9 pin, the RS232C cable should be connected to your computer via the 9 to 25 pin adapter [2] supplied.

3. Where necessary, connect the RS232C cable [1] and 9 to 25 pin adapter [2] together. Ensure all connection retention screws are fully tightened.

Note...

The RS232C cable/9 to 25 pin adapter should normally be connected to the COMM1 serial port on your PC. Where this is not possible, and therefore the COMM2 serial port is to be used, it is important to remember that your TRACECUT system will need to be configured for use with this port. For instructions on how this is achieved, refer to your TRACECUT on-line help.

4. Connect the RS232C cable/9 to 25 pin adapter, as applicable, to the COMM1 serial port on your PC. Ensure that connection retention screws are fully tightened.
5. Connect the remaining end of the RS232C cable [1] to the RS232 port on your machine tool's controller.



- 1. RS232C cable
- 2. 9 to 25 pin adapter

Figure 2.5 - Connecting your PC to your machine tool's controller

Installing TRACECUT to your PC

Assembling the TRACECUT dongle for your PC

Notes...

Your TRACECUT system may be supplied with many different types of dongle. Each type of dongle has a specific use and can be identified by its serial number. Refer to the TRACECUT on-line help for further information.

A dongle (see Figure 2.6) is a software protection device that must be connected to your PC to allow full use of TRACECUT. If no dongle is present, only communication between the PC and the machine tool is possible.

The dongle supplied with TRACECUT is for parallel port connection only.

1. Remove the TRACECUT dongle and TRACECUT software from the RETROSCAN carrying case and remove all packaging.

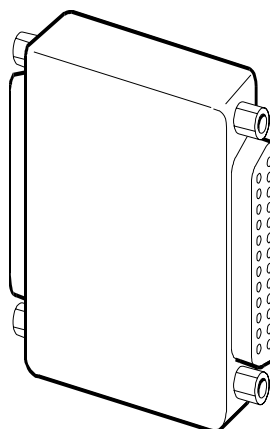


Figure 2.6 - TRACECUT dongle (typical)

2. Identify the type of dongle (see Figure 2.6) supplied with your TRACECUT system for future reference; this can be determined from the dongle's serial number. Refer to the TRACECUT on-line help for further information.
3. Connect the dongle to the parallel port of your PC; refer to the packaging containing your TRACECUT software for further information.

Installing the TRACECUT software onto your PC

For instructions on how to install the TRACECUT software onto your PC, refer to the packaging containing your TRACECUT software.

Downloading TRACECUT 23a service pack 1

The TRACECUT 23a service pack 1 enables TRACECUT version 23a to use the Renishaw CC5 probe interface card. To install the service pack onto your PC, carry out the following:

1. Access the Renishaw website at www.renishaw.com and download the file named tr23a_sp1.exe (self-extracting zip file) to your local hard drive.
2. Start Windows Explorer, or open a command prompt window, and go to the drive and directory containing the file tr23a_sp1.exe.
3. Double-click on tr23a_sp1, or type 'tr23a_sp1' and press Enter.
4. Run Setup.exe file.

Note that the first time the PC is switched on after installing the CC5 probe interface card, Windows 95, 98, ME and 2000 will request a driver. This driver can be found within the location above. Windows NT will use the driver that is installed when the service pack is installed. Note also that Windows 2000 requires that the 'plug and play operating system' setting in the Bios be set to 'No'.

TRACECUT version 23a only supports I/O ports 200, 210, 300 and 310 (Hexadecimal). In order to support the CC5 probe interface card, the drivers will simulate devices within this range (the actual addresses used being assigned by the 'plug and play operating system'). As a result, the CC1 probe device will appear to be at address 300 and the CC4 or SC3 scales device at 310. These addresses will be displayed by the diagnostics program and must therefore be entered within the 'RENSCAN 200 Specific Parameters' section of the TRACECUT software.

Calibrating your RETROSCAN scanning system

For instructions on how to calibrate your RETROSCAN scanning system, refer to the TRACECUT On-line Help.

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CHAPTER 3

System installation - RENSCAN upgrade kit

This chapter provides you with detailed, step-by-step instructions on how to install the RENSCAN upgrade kit to your machine tool.

Contained in this chapter

- | | |
|--|---|
| ■ Installing the RENSCAN upgrade kit to your machine tool and personal computer3-2 | ■ Installing the cable junction unit (CJU) to your machine tool..... 3-6 |
| ■ Installing the counter card into your personal computer.....3-3 | ■ Connecting the cable junction unit (CJU) to your counter card 3-8 |
| ■ Preparing the counter card3-3 | ■ Calibrating your RENSCAN 200 scanning system 3-11 |
| ■ Installing the counter card3-4 | |

Installing the RENSCAN upgrade kit to your machine tool and personal computer

WARNING

INSTALLATION OF THE RENSCAN UPGRADE KIT MUST ONLY BE UNDERTAKEN BY FULLY QUALIFIED PERSONNEL WHO ARE FULLY CONVERSANT WITH ALL SAFETY PROCEDURES AND LEGISLATION IN FORCE IN THE COUNTRY OF USE.

CAUTION

OBSERVE ANTI-STATIC PRECAUTIONS AT ALL TIMES. FAILURE TO ADEQUATELY PROTECT AGAINST STATIC DISCHARGE CAN RESULT IN DAMAGE TO THE COUNTER CARD

Notes...

Do not attempt to install your RENSCAN 200 upgrade kit unless your machine tool has been previously fitted with a RETROSCAN scanning system. Instructions for fitting RETROSCAN to your machine tool can be found in chapter 2 of this publication. If your RETROSCAN scanning system has been supplied with a CC5 probe interface card, all references to the counter card contained within this chapter may be ignored.

Prior to beginning installation of the RENSCAN 200 upgrade kit to your machine tool, ensure that you have the following documentation:

- Your computer manual.
- Your machine tool manufacturer's literature.

Installing the counter card into your personal computer

CAUTIONS...

THE COUNTER CARD IS SUBJECT TO DAMAGE BY STATIC DISCHARGE. IT IS THEREFORE RECOMMENDED THAT THE USE OF AN ANTI-STATIC WRISTBAND, CONNECTED TO A SUITABLE EARTH POINT, IS EMPLOYED WHENEVER THE CARD IS HANDLED.

MOVEMENT, WHICH CAN GENERATE STATIC ELECTRICITY, SHOULD ALSO BE KEPT TO A MINIMUM.

THE FOLLOWING INSTRUCTIONS ARE OF A GENERAL NATURE. FOR SPECIFIC INFORMATION/INSTRUCTIONS ON HOW THE COUNTER CARD MUST BE INSTALLED INTO YOUR PERSONAL COMPUTER (PC), REFER TO THE USER/TECHNICAL REFERENCE MANUAL SUPPLIED WITH YOUR PC.

Preparation of the counter card

Note...

If the base address setting of the counter card is changed, it is important to ensure that, following installation, the base address setting in TRACECUT is also changed. This can be achieved by accessing the RENSCAN specific parameters within the Utilities section of the TRACECUT software and entering the correct address. Refer to your TRACECUT on-line help for instructions on how to perform this task.

The counter card (see Figure 3.1) is supplied pre-set to I/O base address 310 hex. Whilst this setting should be correct for most installations, if this base address is already being used by another card within your PC (or your PC has difficulty in accessing the card), the base address may be changed to one of the following:

- 200 hex.
- 210 hex.
- 300 hex.

To change the I/O base address of the counter card, carry out the following (see Figure 3.1):

1. Remove the counter card [1] from the carrying case.
2. Remove the counter card [1] from its protective wrapping.
3. Alter switch SW1 [2] to the required setting in accordance with Figure 3.1.

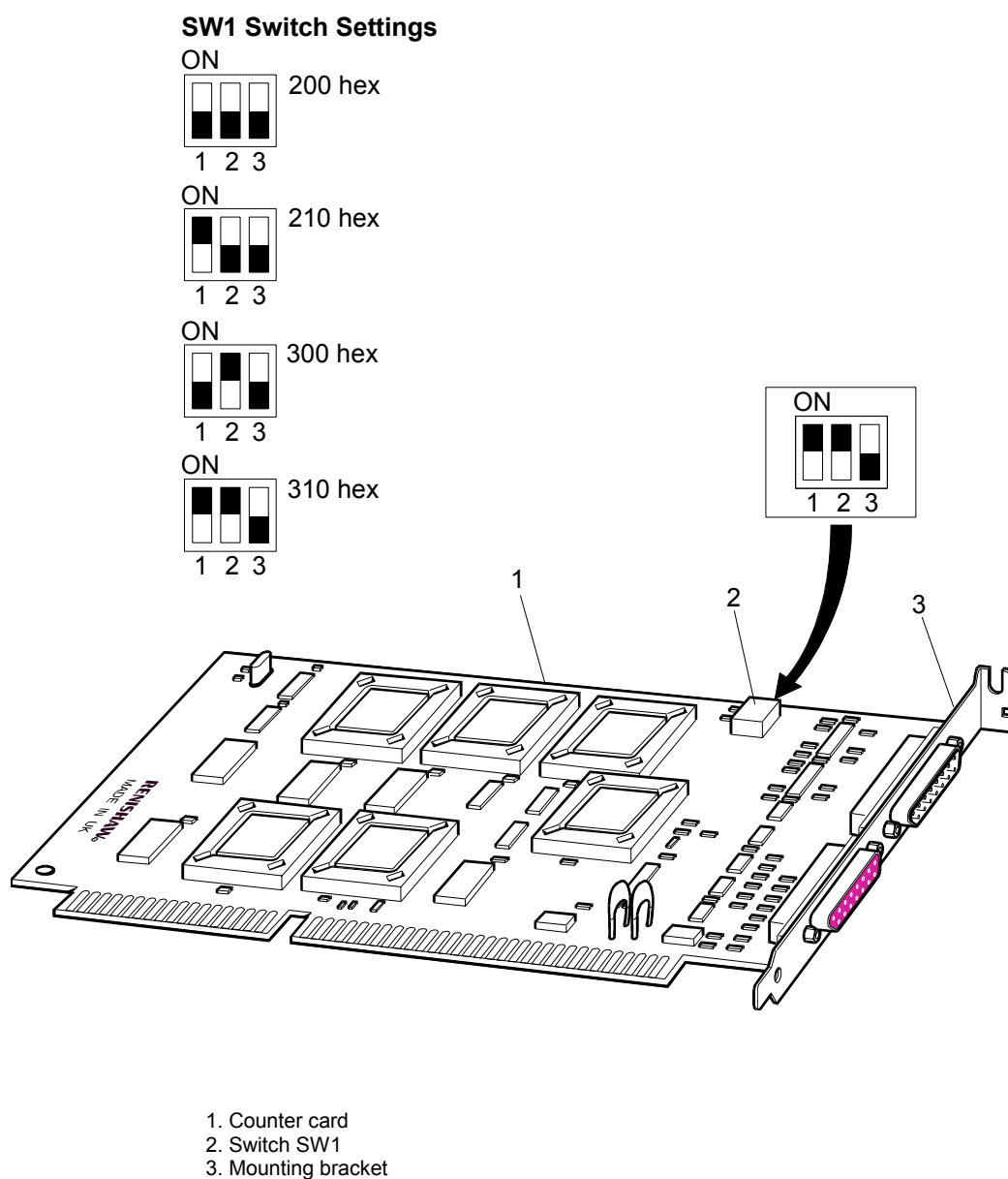


Figure 3.1 - Counter card switch settings

Installation of the counter card

To install the counter card within your PC, carry out the following (see Figure 3.1):

Note...

The following instructions are for guidance only. Consult the User Manual or Technical Reference Manual supplied with your PC for specific instructions/safety information.

1. Disconnect the power supply to your PC.
2. Remove the external covers of the PC in accordance the manufacturer's instructions.
3. Locate a vacant 8 or 16 bit bus slot into which the counter card [1] can be fitted.
4. Observing anti-static precautions, carefully slot the counter card [1] into place (following all manufacturer's instructions). Ensure that no part of the counter card is in contact with other expansion cards within your PC.
5. Screw the mounting bracket [3] of the counter card [1] to the back panel rail of your PC.
6. Make a final check of the installation.
7. Replace the external covers of the PC.
8. Reconnect the power supply to your PC.

Installing the cable junction unit (CJU) on your machine tool

WARNING

DO NOT ATTEMPT TO ACCESS THE MACHINE TOOL'S CIRCUITRY WITHOUT FIRST ISOLATING ITS ELECTRICAL POWER SUPPLY.

Notes...

The CJU connects between the scale/encoder board and X, Y and Z encoder cables of your machine tool and will have been fitted with a PL 95 output cable. The six 22 way connecting cables will also have been fitted with connectors, determined at the time of order, that are appropriate for the type of machine tool to which the CJU is to be installed.

If you are installing the RENSCAN upgrade kit to a machine tool incorporating a Heidenhain controller, the CJU is not required. In this instance, a Heidenhain EXE Unit and associated cables should be used.

To install the CJU to your machine tool, carry out the following (see Figure 3.2):

1. Remove the CJU from the RENSCAN upgrade kit carrying case and remove all packaging.
2. Isolate the electrical power supply to your machine tool.
3. Locate the controller on your machine tool.
4. Using masking tape and pencil, and referring to the machine tool manufacturer's literature, identify the following:
 - The X, Y and Z input connectors/cables to your machine tool controller's scale/encoder board (sometimes referred to as the counter card).
 - The X, Y and Z encoder output cables of your machine tool.

5. Disconnect the X, Y and Z encoder output cables from your machine tool's controller.
6. Referring to the top cover of your CJU for cable identification, connect the X, Y and Z 'ENCODER' cables of the CJU to the X, Y and Z encoder output cables of your machine tool.
7. Referring to the top cover of your CJU for cable identification, connect the X, Y and Z 'CONTROLLER' cables of the CJU to the X, Y and Z scale/encoder board connections/cables of your machine tool's controller.
8. Remove masking tape from scale/encoder board connections/cables and encoder output cables.
9. Secure the CJU into position within the machine tool using four M4x16 pan head screws and four 4mm nuts (supplied).

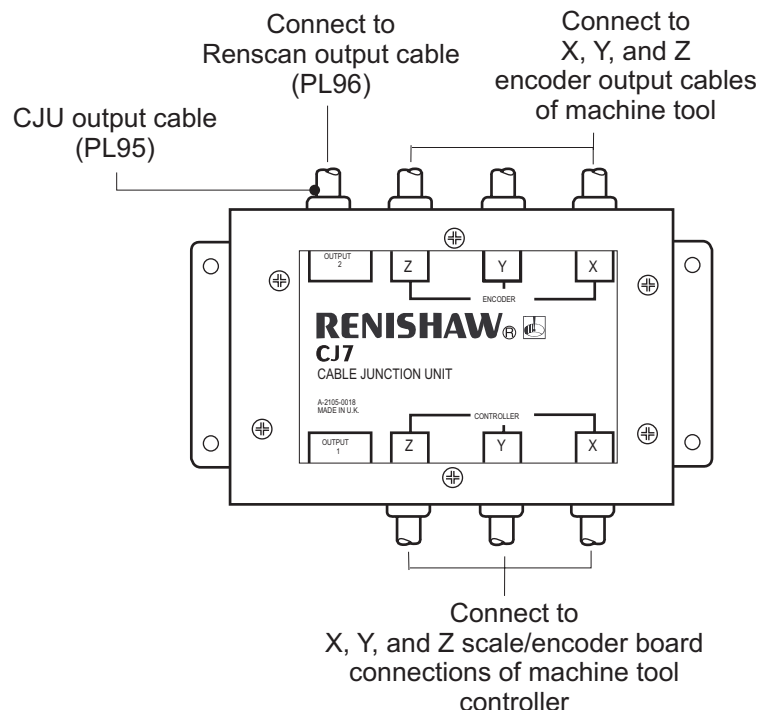


Figure 3.2 - Installing the CJU to your machine tool

Connecting the cable junction unit (CJU) to your counter card or CC5 probe interface card

WARNING

DO NOT ATTEMPT TO ACCESS THE MACHINE TOOL'S CIRCUITRY WITHOUT FIRST ISOLATING ITS ELECTRICAL POWER SUPPLY.

Notes...

It is important to ensure that the CJU output cable (PL95) is connected to the 'OUTPUT 2' connector on the CJU.

It is important to use RENSCAN output cable PL96 to connect the CJU to the counter card.

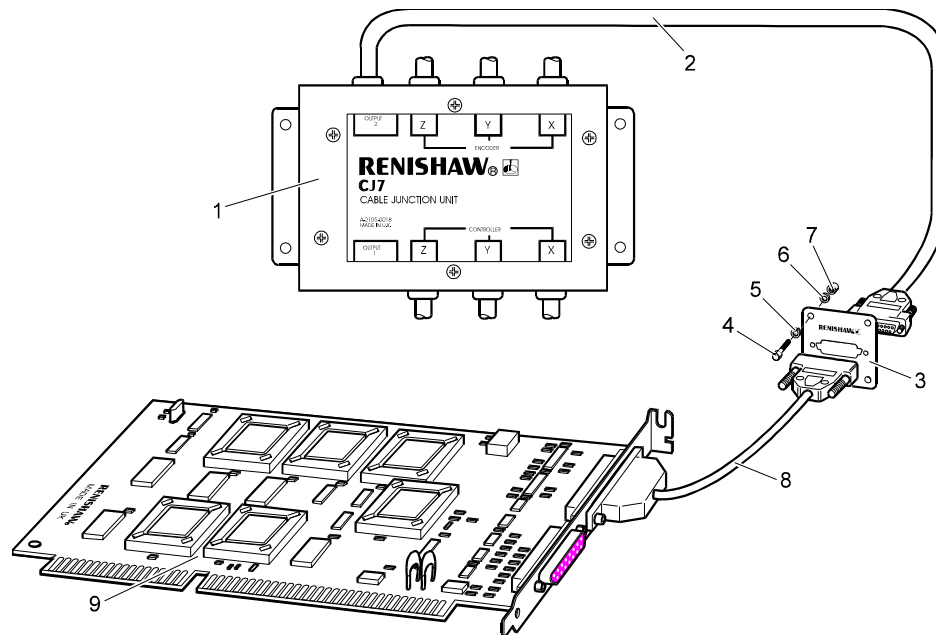
To connect the CJU [1] to the counter card [9], carry out the following (refer to Figure 3.3 and 3.4):

1. Remove RENSCAN output cable (PL96) from the RENSCAN upgrade kit carrying case as required.
2. Remove cable from packaging.

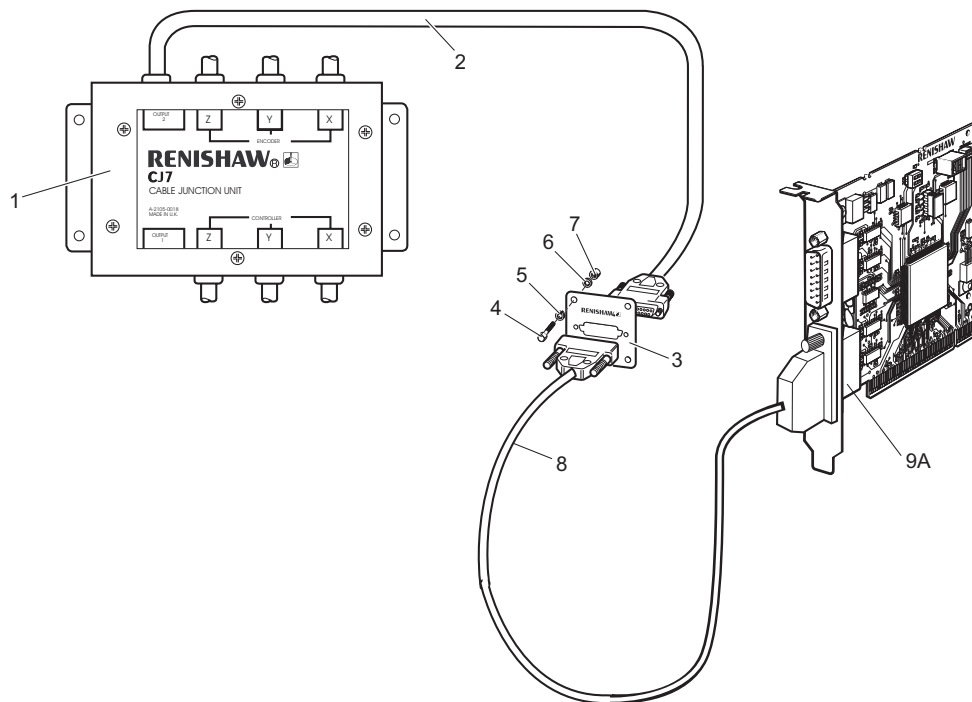
Note...

The RENSCAN upgrade kit includes a connector mount [3] that can be installed within a suitable panel of your machine tool to provide a bulkhead type connector between the CJU output cable (PL95) [2] and the RENSCAN output cable (PL96) [8]. If you wish to use this facility, carry out steps 3A thru 3H below. If this facility is not required, proceed directly to step 4.

3. To install the connector mount [3] within one of your machine tool's panels, carry out the following (see Figures 3.3 and 3.4):
 - A. Remove the connector mount [3], together with associated screws, nuts and washers, from the RENSCAN upgrade kit carrying case. Remove parts from packaging.



Connecting the CJU to the counter card (typical)



Connecting the CJU to a CC5 probe interface card

1. CJU
2. CJU output cable (PL95)
3. Connector mount
4. M4 pan head screw (4 Off)
5. Spring washer (4 Off)
6. Plain washer (4 Off)
7. M4 nut (4 Off)
8. RENSCAN output cable (PL96)
9. Counter card
- 9A. CC5 probe interface card

Figure 3.3 - Connecting the CJU to the counter card or CC5 probe interface card

Note...

When selecting a suitable position into which to install the connector mount [3], ensure that, following installation, both sides of the connector mount will be accessible in order that the four securing nuts and bolts can be tightened.

- B. Route the CJU output cable (PL95) [2] to a suitable exit position on one of the machine tool panels and mark position on rear of panel. Ensure cable has sufficient slack and that it is routed away from high current heavy duty cables, pumps, motors, transformers etc.
- C. Position the connector mount [3] (with Renishaw logo uppermost and facing away from you) against the rear of the panel and, using a pencil, mark the following onto the panel:
 - The position of the four bolt holes.
 - The outline of the slot.
- D. Using a 5mm drill, drill out the four bolt location holes within the machine tool panel (as shown in Figure 3.4). Deburr holes of any rough or sharp edges.
- E. Using the marked outline produced from the slot in the connector mount, drill and cut the panel (as shown in Figure 3.4) to produce a slot 50mm (2 in.) long by 15mm (0.6 in.) wide. Deburr slot of any rough or sharp edges.

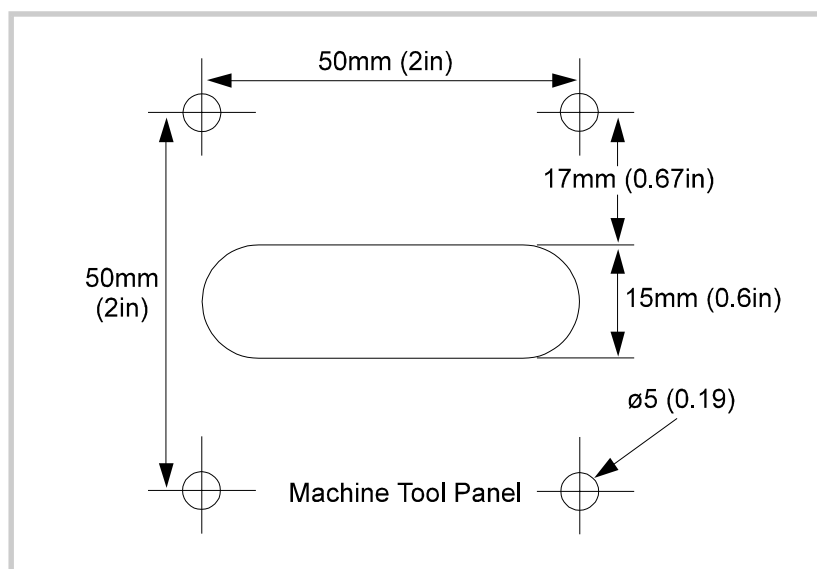


Figure 3.4 - Connector mount (panel mounting dimensions)

Note...

If your machine tool is subject to vibration that may cause the M4 nuts [7] to work loose, use self-locking nuts in their place.

- F. With reference to Figure 3.3, mount connector mount [3] to front of panel (Renishaw logo uppermost and facing towards you) and secure with four M4 pan head screws [4], four spring washers [5], four plain washers [6], and four M4 nuts [7].
 - G. Remove jack screws from output connector of CJU output cable (PL95) [2].
 - H. Insert end of output connector through panel and connector mount [3] and, using jack screws, secure connector to connector mount.
- 4. Using cable ties provided, secure CJU output cable [2] into its final position.
 - 5. Connect the RENSCAN output cable [8] to the CJU output cable [2] and secure together.
 - 6. Connect the RENSCAN output cable [8] to the counter card [9] or CC5 probe interface card (as applicable) and secure in position.

Calibrating your RENSCAN 200 scanning system

For instructions on how to calibrate your RENSCAN 200 scanning system, refer to your TRACECUT on-line help.

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